

D

Е

F

Н

J

Κ

L

Ν

0

CONTENTS

VQ35HR	THROTTLE VALVE CLOSED POSITION
BASIC INSPECTION16	LEARNING : Description25 THROTTLE VALVE CLOSED POSITION
	LEARNING : Special Repair Requirement25
DIAGNOSIS AND REPAIR WORKFLOW16	IDLE AIR VOLUME LEARNING25
Work Flow16 Diagnostic Work Sheet19	IDLE AIR VOLUME LEARNING : Description25
•	IDLE AIR VOLUME LEARNING : Special Repair
INSPECTION AND ADJUSTMENT20	Requirement25
BASIC INSPECTION20	EXHAUST VALVE TIMING CONTROL LEARNING
BASIC INSPECTION : Special Repair Require-	27
ment20	EXHAUST VALVE TIMING CONTROL LEARN-
ADDITIONAL SERVICE WHEN REPLACING	ING: Description27
CONTROL UNIT23	EXHAUST VALVE TIMING CONTROL LEARN-ING: Special Repair Requirement27
ADDITIONAL SERVICE WHEN REPLACING	ino : Special Nepall Nequilement27
CONTROL UNIT: Description23	MIXTURE RATIO SELF-LEARNING VALUE
ADDITIONAL SERVICE WHEN REPLACING	CLEAR28
CONTROL UNIT : Special Repair Requirement23	MIXTURE RATIO SELF-LEARNING VALUE
IDLE SPEED23	CLEAR: Description28 MIXTURE RATIO SELF-LEARNING VALUE
IDLE SPEED : Description24	CLEAR: Special Repair Requirement28
IDLE SPEED : Special Repair Requirement24	· · · · ·
IGNITION TIMING24	SYSTEM DESCRIPTION29
IGNITION TIMING : Description24	ENGINE CONTROL SYSTEM29
IGNITION TIMING: Special Repair Requirement24	System Diagram29
VIN REGISTRATION24	System Description30
VIN REGISTRATION : Description24	Component Parts Location31
VIN REGISTRATION : Special Repair Require-	Component Description37
ment24	MULTIPORT FUEL INJECTION SYSTEM39
ACCELERATOR PEDAL RELEASED POSITION	System Diagram39
LEARNING25	System Description39
ACCELERATOR PEDAL RELEASED POSITION	Component Parts Location42
LEARNING : Description25	Component Description48
ACCELERATOR PEDAL RELEASED POSITION	ELECTRIC IGNITION SYSTEM50
LEARNING : Special Repair Requirement25	System Diagram50
THROTTLE VALVE CLOSED POSITION LEARN-	System Description50
INC	Component Parts Location 51

Component Description	57	Diagnosis Procedure	147
AIR CONDITIONING CUT CONTROL	58	U0164 CAN COMM CIRCUIT	148
System Diagram	58	Description	
System Description	58	DTC Logic	148
Component Parts Location	59	Diagnosis Procedure	
Component Description		U1001 CAN COMM CIRCUIT	
AUTOMATIC SPEED CONTROL DEVICE		Description	
(ASCD)	cc	DTC Logic	
•		Diagnosis Procedure	
System Diagram		Diagnosis Procedure	149
System Description		P0011, P0021 IVT CONTROL	150
Component Parts Location		DTC Logic	
Component Description	/4	Diagnosis Procedure	
CAN COMMUNICATION	75	Component Inspection	
System Description		·	
·		P0014, P0024 EVT CONTROL	
COOLING FAN CONTROL		DTC Logic	
System Diagram		Diagnosis Procedure	
System Description		Component Inspection	156
Component Parts Location	77	D0024 D0022 D0064 D0062 A/E CENCO	D 4
Component Description	83	P0031, P0032, P0051, P0052 A/F SENSO HEATER	
EVAPORATIVE EMISSION SYSTEM	0.4		
	_	Description	
System Diagram		DTC Logic	
System Description		Diagnosis Procedure	
Component Parts Location		Component Inspection	160
Component Description	93	P0037, P0038, P0057, P0058 HO2S2 HEA	AT-
EXHAUST VALVE TIMING CONTROL	95	ER	
System Diagram		Description	
System Description		DTC Logic	
Component Parts Location		Diagnosis Procedure	
Component Description		Component Inspection	
INTAKE VALVE TIMING CONTROL		P0075, P0081 IVT CONTROL SOLENOID	
System Diagram		VALVE	164
System Description		Description	164
Component Parts Location		DTC Logic	164
Component Description	110	Diagnosis Procedure	164
ON BOARD DIAGNOSTIC (OPD) SYSTEM	1 444	Component Inspection	165
ON BOARD DIAGNOSTIC (OBD) SYSTEM		DOOZO DOOGA EVE CONTROL MACNET	D.E.
Diagnosis Description		P0078, P0084 EVT CONTROL MAGNET	
CONSULT-III Function		TARDER	
Diagnosis Tool Function	133	Description	
DTC/CIRCUIT DIAGNOSIS	136	DTC Logic	
		Diagnosis Procedure	
TROUBLE DIAGNOSIS - SPECIFICATION		Component Inspection	168
VALUE	136	P0101, P010B MAF SENSOR	170
Description	136		
Component Function Check		Description	
Diagnosis Procedure		DTC Logic	
· ·		Component Function Check	
POWER SUPPLY AND GROUND CIRCUIT		Diagnosis Procedure	
Diagnosis Procedure	144	Component Inspection	1/4
U0101 CAN COMM CIRCUIT	4 47	P0102, P0103, P010C, P010D MAF SENS	OR.177
		Description	
Description		DTC Logic	
DTC Logic	14/	Diagnosis Procedure	

Component Inspection	179	Description	212	
		DTC Logic		\triangle
P0112, P0113 IAT SENSOR		Diagnosis Procedure	214	
Description		-		
DTC Logic		P0137, P0157 HO2S2		EC
Diagnosis Procedure		Description		
Component Inspection	184	DTC Logic	217	
		Component Function Check	218	
P0116 ECT SENSOR		Diagnosis Procedure	219	C
Description		Component Inspection		
DTC Logic				
Diagnosis Procedure	187	P0138, P0158 HO2S2	223	
Component Inspection	187	Description	223	L
		DTC Logic	223	
P0117, P0118 ECT SENSOR		Component Function Check	225	
Description		Diagnosis Procedure		Е
DTC Logic		Component Inspection		
Diagnosis Procedure	189	·		
Component Inspection	190	P0139, P0159 HO2S2	231	F
		Description	231	
P0122, P0123, P0227, P0228 TP SENSOR		DTC Logic	231	
Description		Component Function Check	232	
DTC Logic		Diagnosis Procedure		G
Diagnosis Procedure	192	Component Inspection		
Component Inspection				
Special Repair Requirement	193	P0171, P0174 FUEL INJECTION SYSTEM		-
		FUNCTION	237	
P0125 ECT SENSOR		DTC Logic	237	
Description	195	Diagnosis Procedure		
DTC Logic	195	· ·		I
Diagnosis Procedure	196	P0172, P0175 FUEL INJECTION SYSTEM		
Component Inspection	196	FUNCTION	241	
		DTC Logic	241	J
P0127 IAT SENSOR		Diagnosis Procedure		
Description				
DTC Logic		P0181 FTT SENSOR	245	K
Diagnosis Procedure		Description	245	r
Component Inspection	199	DTC Logic	245	
DOLOG THERMOOTAT FUNCTION		Diagnosis Procedure	246	
P0128 THERMOSTAT FUNCTION		Component Inspection	247	L
DTC Logic				
Diagnosis Procedure		P0182, P0183 FTT SENSOR	248	
Component Inspection	201	Description	248	N
D0120 D0150 A/E SENSOD 1	202	DTC Logic	248	
P0130, P0150 A/F SENSOR 1		Diagnosis Procedure	248	
Description		Component Inspection		
DTC Logic				Ν
Component Function Check		P0196 EOT SENSOR		
Diagnosis Procedure	204	Description		
P0131, P0151 A/F SENSOR 1	206	DTC Logic		С
		Diagnosis Procedure	252	
Description		Component Inspection	253	
DTC Logic		DOLOR DOLOR DOT 07:1007		
Diagnosis Procedure	207	P0197, P0198 EOT SENSOR		Р
P0132, P0152 A/F SENSOR 1	200	Description		
		DTC Logic		
Description		Diagnosis Procedure	255	
DTC Logic		Component Inspection	255	
Diagnosis Procedure	∠10	B0000 B0000 B0400 B0400 ED 0ENGO		
P0133, P0153 A/F SENSOR 1	212	P0222, P0223, P2132, P2133 TP SENSOR		
		Description	257	

DTC Logic25	7 DTC Logic30	05
Diagnosis Procedure25		
Component Inspection25		
Special Repair Requirement25		•
	P0448 EVAP CANISTER VENT CONTROL	
P0300, P0301, P0302, P0303, P0304, P0305,	VALVE30)9
P0306 MISFIRE 26	1 Description30	ე9
DTC Logic26	1 DTC Logic	ე9
Diagnosis Procedure26	2 Diagnosis Procedure 3 ⁻	10
•	Component Inspection 3	
P0327, P0328, P0332, P0333 KS 26	7	
Description26		
DTC Logic26		13
Diagnosis Procedure26		13
Component Inspection26		
DOSSE CKD SENSOD	Diagnosis Procedure	
P0335 CKP SENSOR27		15
Description27		
DTC Logic27		
Diagnosis Procedure27		
Component Inspection27		
P0340, P0345 CMP SENSOR27	DTC Logic3	
Description	E Diagnosis Flocedule	
DTC Logic27	COMPONENT INSPECTION 32	21
Diagnosis Procedure27		
Component Inspection27		
Component inspection27	33.12 32.133.1	
P0420, P0430 THREE WAY CATALYST	Description	
FUNCTION 28	DTC Logic	
DTC Logic28	Diagnosis Procedure	
Component Function Check28		26
Diagnosis Procedure28		วด
Diagnosis 1 1000agrs20		
P0441 EVAP CONTROL SYSTEM 28	DTC Logic	
DTC Logic28	Diagnosis Procedure	
Component Function Check28	Component Inspection33	2
Diagnosis Procedure28		34
	DTC Logic 33	
P0442 EVAP CONTROL SYSTEM29	Component Function Check 33	
DTC Logic29	1 Diagnosis Procedure	
Diagnosis Procedure29	Component Inspection 34	
Component Inspection29	6	
P0443 EVAP CANISTER PURGE VOLUME	P0460 FUEL LEVEL SENSOR34	41
	_ Description34	41
CONTROL SOLENOID VALVE29	DTG LOGIC	41
Description29	Diauliusis Fluctuult	41
DTC Logic29		
Diagnosis Procedure29		
Component Inspection30	·	
P0444, P0445 EVAP CANISTER PURGE	DTC Logic34	
· ·	Component Function Check34	
VOLUME CONTROL SOLENOID VALVE 30	Diagricolo Frocedure	14
Description		4-
DTC Logic30		
Diagnosis Procedure30		
Component Inspection30		
P0447 EVAP CANISTER VENT CONTROL	Diagnosis Procedure34	1 5
VALVE 30	5 P0500 VSS34	47
Description30	ე — სხასისისი აქ	+/

DTC Logic	347	DTC Logic	374
Component Function Check		Diagnosis Procedure	
Diagnosis Procedure	348		
DOCON IOO OVOTEM		P1217 ENGINE OVER TEMPERATURE	
P0506 ISC SYSTEM		DTC Logic	
Description		Component Function Check	3/5
DTC Logic		Diagnosis Procedure	3/6
Diagnosis Procedure	349	P1225, P1234 TP SENSOR	379
P0507 ISC SYSTEM	351	Description	
Description		DTC Logic	
DTC Logic		Diagnosis Procedure	379
Diagnosis Procedure		Special Repair Requirement	
P0550 PSP SENSOR	353	P1226, P1235 TP SENSOR	391
Description		Description	
DTC Logic		DTC Logic	
Diagnosis Procedure		Diagnosis Procedure	
Component Inspection		Special Repair Requirement	
·			
P0603 ECM POWER SUPPLY		P1233, P2101 ELECTRIC THROTTLE CO	
Description		TROL FUNCTION	
DTC Logic		Description	
Diagnosis Procedure	356	DTC Logic	
P0605 ECM	250	Diagnosis Procedure	
Description		Component Inspection	
DTC Logic		Special Repair Requirement	386
Diagnosis Procedure		P1236, P2118 THROTTLE CONTROL MO-	-
Diagnosis i roccaire	000	TOR	
P0607 ECM	360	Description	
Description	360	DTC Logic	
DTC Logic	360	Diagnosis Procedure	387
Diagnosis Procedure	360	Component Inspection	
P0643 SENSOR POWER SUPPLY	204	Special Repair Requirement	
DTC Logic			
· · · · · · · · · · · · · · · · · · ·		P1238, P2119 ELECTRIC THROTTLE COI	N-
Diagnosis Procedure	301	TROL ACTUATOR	390
P0850 PNP SWITCH	364	Description	390
Description	364	DTC Logic	
DTC Logic	364	Diagnosis Procedure	
Component Function Check	365	Special Repair Requirement	
Diagnosis Procedure	365	P1239, P2135 TP SENSOR	302
D4070 D4004 EVE CONTROL DOCITION		Description	
P1078, P1084 EVT CONTROL POSITION		DTC Logic	
SENSOR		Diagnosis Procedure	
Description		Component Inspection	
DTC Logic		Special Repair Requirement	
Diagnosis Procedure			
Component Inspection	3/1	P1290, P2100, P2103 THROTTLE CONTR	
P1148, P1168 CLOSED LOOP CONTROL	372	MOTOR RELAY	
DTC Logic	372	Description	
B1211 TCS CONTROL LINIT	070	DTC Logic	
P1211 TCS CONTROL UNIT		Diagnosis Procedure	395
Description		P1421 COLD START CONTROL	397
DTC Logic		Description	
Diagnosis Procedure	3/3	DTC Logic	
P1212 TCS COMMUNICATION LINE	374	Diagnosis Procedure	
Description	374	.	

P1550 BATTERY CURRENT SENSOR	399	P1574 ICC VEHICLE SPEED SENSOR	439
Description	399	Description	439
DTC Logic	399	DTC Logic	439
Diagnosis Procedure	400	Diagnosis Procedure	439
Component Inspection	402	DAGGE DE AVE OWITOU	
DATEA DATEO DATTEDY CUDDENT CEN		P1805 BRAKE SWITCH	
P1551, P1552 BATTERY CURRENT SEN-		Description	
SOR		DTC Logic	
Description		Diagnosis Procedure	
DTC Logic		Component Inspection (Stop Lamp Switch)	442
Diagnosis Procedure		P2122, P2123 APP SENSOR	444
Component Inspection	406	Description	
P1553 BATTERY CURRENT SENSOR	408	DTC Logic	
Description		Diagnosis Procedure	
DTC Logic		Component Inspection	
Diagnosis Procedure		Special Repair Requirement	
Component Inspection		·	
·		P2127, P2128 APP SENSOR	448
P1554 BATTERY CURRENT SENSOR	412	Description	448
Description	412	DTC Logic	448
DTC Logic		Diagnosis Procedure	
Component Function Check	412	Component Inspection	451
Diagnosis Procedure	413	Special Repair Requirement	452
Component Inspection	415	DO400 ADD CENCOD	4=-
DATOA A COD OTEEDING OWITCH		P2138 APP SENSOR	
P1564 ASCD STEERING SWITCH		Description	
Description		DTC Logic	
DTC Logic		Diagnosis Procedure	
Diagnosis Procedure		Component Inspection	
Component Inspection	419	Special Repair Requirement	457
P1564 ICC STEERING SWITCH	420	P2A00, P2A03 A/F SENSOR 1	458
Description		Description	
DTC Logic		DTC Logic	
Diagnosis Procedure		Diagnosis Procedure	
Component Inspection		-	
·		ASCD BRAKE SWITCH	
P1568 ICC FUNCTION	423	Description	
DTC Logic		Component Function Check	
Diagnosis Procedure	423	Diagnosis Procedure	
P1572 ASCD BRAKE SWITCH	121	Component Inspection (ASCD Brake Switch)	463
Description		ASCD INDICATOR	465
DTC Logic		Description	
Diagnosis Procedure		Component Function Check	
Component Inspection (ASCD Brake Switch)		Diagnosis Procedure	
Component Inspection (Stop Lamp Switch)		Diagnosis i roccaro	100
Component mopeonon (Gtop Lamp Gwiton)	420	COOLING FAN	466
P1572 ICC BRAKE SWITCH	430	Description	466
Description	430	Component Function Check	
DTC Logic	430	Diagnosis Procedure	466
Diagnosis Procedure		Component Inspection (Cooling Fan Motor)	
Component Inspection (ICC Brake Switch)		Component Inspection (Cooling Fan Relay)	469
Component Inspection (Stop Lamp Switch)		ELECTRICAL LOAD SIGNAL	,
Component Inspection (ICC Brake Hold Relay)436	ELECTRICAL LOAD SIGNAL	
DAETA ACCO VELICI E COEED CENCOD		Description	
P1574 ASCD VEHICLE SPEED SENSOR		Component Function Check	
Description		Diagnosis Procedure	4/0
DTC Logic		FUEL INJECTOR	472
Diagnosis Procedure	437		

Description472	
Component Function Check472	
Diagnosis Procedure472	
Component Inspection474	
FUEL PUMP475	How to Set SRT Code546
	Test Value and Test Limit548
Description	
Component Function Check	
Diagnosis Procedure	
Component Inspection477	Symptom Table555
ICC BRAKE SWITCH478	Symptom rable
Description478	NODMAL ODEDATING CONDITION
Component Function Check478	
Diagnosis Procedure478	•
Component Inspection (ICC Brake Switch) 481	
Compension mopeonem (100 Brane Cimen, immini 101	
IGNITION SIGNAL482	PRECAUTIONS560
Description482	Precaution for Supplemental Restraint System
Component Function Check482	(SRS) "AIR BAG" and "SEAT BELT PRE-TEN-
Diagnosis Procedure482	SIONER"560
Component Inspection (Ignition Coil with Power	Precaution for Procedure without Cowl Top Cover.560
Transistor)485	Precautions For Xenon Headlamp Service560
Component Inspection (Condenser)486	On Board Diagnostic (OBD) System of Engine
INTERPRETATION PION AV (ACCE)	and A/T561
INFORMATION DISPLAY (ASCD)487	
Description487	
Component Function Check487	
Diagnosis Procedure487	PREPARATION565
MALFUNCTION INDICATOR LAMP488	
Description488	
Component Function Check	
Diagnosis Procedure488	
Diagnosis i rocedure400	
ON BOARD REFUELING VAPOR RECOV-	FUEL PRESSURE567
ERY (ORVR)489	Inspection567
Description489	
Component Function Check	
Diagnosis Procedure489	1113000011011
Component Inspection492	
POSITIVE CRANKCASE VENTILATION 494	
Description494	·
Component Inspection494	
DEEDICEDANT DDESCUDE SENSOD	Inspection571
REFRIGERANT PRESSURE SENSOR496	
Description	
Component Function Check	
Diagnosis Procedure496	
SNOW MODE SWITCH498	SERVICE DATA AND SPECIFICATIONS
Description498	(303)572
Component Function Check	luie Speed
Diagnosis Procedure498	Igilition filling
Component Inspection500	Calculated Load value572
Component inspection	Mass All Flow Selisor572
ECU DIAGNOSIS INFORMATION501	VK50VE
	DAGIO INODECTION
ECM501	BASIC INSPECTION573
Reference Value501	DIAGNOSIS AND DEDAID WORKELOW 570
	DIAGNOSIS AND REPAIR WORKFLOW 573

Revision: 2009 March **EC-7** 2009 FX35/FX50

		_
Work Flow573	VVEL CONTROL SHAFT POSITION SENSOR	
Diagnostic Work Sheet576	ADJUSTMENT: Special Repair Requirement 584	4
INSPECTION AND ADJUSTMENT 577	MIXTURE RATIO SELF-LEARNING VALUE	
	CLEAR 580	6
BASIC INSPECTION577	MIXTURE RATIO SELF-LEARNING VALUE	
BASIC INSPECTION : Special Repair Require-	CLEAR: Description586	6
ment577	MIXTURE RATIO SELF-LEARNING VALUE	
ADDITIONAL SERVICE WHEN REPLACING	CLEAR: Special Repair Requirement586	6
CONTROL UNIT (ECM)580	SYSTEM DESCRIPTION588	_
ADDITIONAL SERVICE WHEN REPLACING	5151EW DESCRIPTION588	8
CONTROL UNIT (ECM): Description580	ENGINE CONTROL SYSTEM588	8
ADDITIONAL SERVICÉ WHEN REPLACING	System Diagram588	
CONTROL UNIT (ECM) : Special Repair Require-	System Description589	
ment580	Component Parts Location590	
ADDITIONAL SERVICE WILEN DEDLACING	Component Description598	
ADDITIONAL SERVICE WHEN REPLACING		
CONTROL UNIT (VVEL CONTROL MODULE)580 ADDITIONAL SERVICE WHEN REPLACING	MULTIPORT FUEL INJECTION SYSTEM600	
CONTROL UNIT (VVEL CONTROL MODULE):	System Diagram	
Description580	System Description	
ADDITIONAL SERVICE WHEN REPLACING	Component Parts Location	
CONTROL UNIT (VVEL CONTROL MODULE):	Component Description61	1
Special Repair Requirement580	ELECTRIC IGNITION SYSTEM612	2
	System Diagram612	
IDLE SPEED581	System Description612	
IDLE SPEED : Description581	Component Parts Location613	
IDLE SPEED : Special Repair Requirement581	Component Description62	
IGNITION TIMING581		
IGNITION TIMING : Description581	AIR CONDITIONING CUT CONTROL622	
IGNITION TIMING : Special Repair Requirement.581	System Diagram622	
· · · ·	System Description	
VIN REGISTRATION581	Component Parts Location	
VIN REGISTRATION : Description581	Component Description63	1
VIN REGISTRATION : Special Repair Require-	AUTOMATIC SPEED CONTROL DEVICE	
ment582	(ASCD)633	2
ACCELERATOR PEDAL RELEASED POSITION	System Diagram	
LEARNING582	System Description632	
ACCELERATOR PEDAL RELEASED POSITION	Component Parts Location634	
LEARNING : Description582	Component Description 642	
ACCELERATOR PEDAL RELEASED POSITION		
LEARNING: Special Repair Requirement582	CAN COMMUNICATION64	
TUDOTTI E VALVE OI 00ED DOCITIONI EADN	System Description64	3
THROTTLE VALVE CLOSED POSITION LEARN-	COOLING FAN CONTROL644	4
ING582 THROTTLE VALVE CLOSED POSITION	System Diagram64	
	System Description64	
LEARNING: Description582 THROTTLE VALVE CLOSED POSITION	Component Parts Location64	
LEARNING : Special Repair Requirement582	Component Description	
LEAKINING : Special Repail Requirement		
IDLE AIR VOLUME LEARNING582	EVAPORATIVE EMISSION SYSTEM654	
IDLE AIR VOLUME LEARNING : Description583	System Diagram654	
IDLE AIR VOLUME LEARNING : Special Repair	System Description	
Requirement583	Component Parts Location65	
VVEL CONTROL SHAFT POSITION SENSOR AD-	Component Description669	5
JUSTMENT584	EXHAUST VALVE TIMING CONTROL660	6
VVEL CONTROL SHAFT POSITION SENSOR	System Diagram	
ADJUSTMENT: Description584	System Diagram 666	
	-, >	_

Component Parts Location667	P0014, P0024 EVT CONTROL752
Component Description675	DTC Logic752
FUEL DUMP CONTROL MODULE	Diagnosis Procedure753
FUEL PUMP CONTROL MODULE676	Component Inspection754
System Diagram 676	D0004 D0000 D0054 D0050 A/E 05N00D 4
System Description 676	P0031, P0032, P0051, P0052 A/F SENSOR 1
Component Parts Location	HEATER756
Component Description685	Description
INTAKE VALVE TIMING CONTROL686	DTC Logic
System Diagram686	Diagnosis Procedure
System Description	Component Inspection758
Component Parts Location687	P0037, P0038, P0057, P0058 HO2S2 HEAT-
Component Description695	ER759
·	Description
VVEL SYSTEM696	DTC Logic
System Diagram696	Diagnosis Procedure760
System Description696	Component Inspection761
Component Parts Location697	
Component Description705	P0075, P0081 IVT CONTROL SOLENOID
ON BOARD DIAGNOSTIC (OBD) SYSTEM 706	VALVE762
Diagnosis Description706	Description762
CONSULT-III Function	DTC Logic762
Diagnosis Tool Function	Diagnosis Procedure762
Diagnosis 100i i unction	Component Inspection763
DTC/CIRCUIT DIAGNOSIS731	
	P0078, P0084 EVT CONTROL SOLENOID
TROUBLE DIAGNOSIS - SPECIFICATION	VALVE765
VALUE731	Description765
Description731	DTC Logic765
Component Function Check731	Diagnosis Procedure765
Diagnosis Procedure732	Component Inspection766
POWER SUPPLY AND GROUND CIRCUIT739	P0101, P010B MAF SENSOR768
	Description
Diagnosis Procedure739	DTC Logic
U0101 CAN COMM CIRCUIT742	Component Function Check770
Description	Diagnosis Procedure770
DTC Logic	Component Inspection
Diagnosis Procedure	·
-	P0102, P0103, P010C, P010D MAF SENSOR. 775
U0113, U1003 CAN COMM CIRCUIT743	Description775
Description743	DTC Logic775
DTC Logic743	Diagnosis Procedure776
Diagnosis Procedure743	Component Inspection777
HAGGA CAN COMM CIDCUIT	D0442 D0442 IAT CENCOD
U1001 CAN COMM CIRCUIT745	P0112, P0113 IAT SENSOR781
Description	Description
DTC Logic	DTC Logic
Diagnosis Procedure745	Diagnosis Procedure
U1024 CAN COMM CIRCUIT746	Component Inspection782
Description	P0116 ECT SENSOR784
DTC Logic	Description
Diagnosis Procedure	DTC Logic
Diagnosis i 10000016	Diagnosis Procedure785
P0011, P0021 IVT CONTROL748	Component Inspection
DTC Logic	Component inspection/00
Diagnosis Procedure749	P0117, P0118 ECT SENSOR786
Component Inspection	Description786
	DTC Logic

Revision: 2009 March **EC-9** 2009 FX35/FX50

Diagnosis Procedure	787	P0139, P0159 HO2S2	828
Component Inspection	787	Description	
DOLOG DOLOG DOGGE DOGGE TO OFNICOD		DTC Logic	
P0122, P0123, P0227, P0228 TP SENSOR		Component Function Check	829
Description		Diagnosis Procedure	
DTC Logic		Component Inspection	831
Diagnosis Procedure		DO474 DO474 FUEL IN IEOTION OVOTEN	
Component Inspection		P0171, P0174 FUEL INJECTION SYSTEM	
Special Repair Requirement	791	FUNCTION	
P0125 ECT SENSOR	792	DTC Logic	
Description		Diagnosis Procedure	835
DTC Logic		P0172, P0175 FUEL INJECTION SYSTEM	
Diagnosis Procedure		FUNCTION	000
Component Inspection			
Component mopositori		DTC Logic	
P0127 IAT SENSOR	. 795	Diagnosis Procedure	839
Description	795	P0181 FTT SENSOR	842
DTC Logic	795	Description	
Diagnosis Procedure	796	DTC Logic	
Component Inspection	796	Diagnosis Procedure	
		Component Inspection	
P0128 THERMOSTAT FUNCTION		·	
DTC Logic		P0182, P0183 FTT SENSOR	845
Diagnosis Procedure		Description	845
Component Inspection	798	DTC Logic	845
P0130, P0150 A/F SENSOR 1	700	Diagnosis Procedure	845
		Component Inspection	847
Description			
DTC Logic		P0196 EOT SENSOR	
Component Function Check		Description	
Diagnosis Procedure	801	DTC Logic	
P0131, P0151 A/F SENSOR 1	. 803	Diagnosis Procedure	
Description		Component Inspection	850
DTC Logic		P0197, P0198 EOT SENSOR	0E4
Diagnosis Procedure		Description	
		DTC Logic	
P0132, P0152 A/F SENSOR 1	. 806	Diagnosis Procedure	
Description	806		
DTC Logic		Component Inspection	652
Diagnosis Procedure	807	P0222, P0223, P2132, P2133 TP SENSOR	854
DO422 DO452 A/E CENCOD 4		Description	
P0133, P0153 A/F SENSOR 1		DTC Logic	
Description		Diagnosis Procedure	
DTC Logic		Component Inspection	
Diagnosis Procedure	811	Special Repair Requirement	
P0137, P0157 HO2S2	81 <i>1</i>	·	
Description		P0225 TP SENSOR	
DTC Logic		DTC Logic	857
Component Function Check		D0200 D0204 D0202 D0202 D0204 D020E	
Diagnosis Procedure		P0300, P0301, P0302, P0303, P0304, P0305	-
Component Inspection		P0306, P0307, P0308 MISFIRE	
Component inspection	017	DTC Logic	
P0138, P0158 HO2S2	. 820	Diagnosis Procedure	859
Description		P0327, P0328, P0332, P0333 KS	861
DTC Logic			
Component Function Check		Description DTC Logic	
Diagnosis Procedure		Diagnosis Procedure	
Component Inspection		Component Inspection	
· · · · · · · · · · · · · · · · · · ·		Oumponom mopeodon	000

P0335 CKP SENSOR	867	Diagnosis Procedure	910	
Description	867	Component Inspection	911	A
DTC Logic	867	DOAGO EVAD CONTDOL CYCTEM DDEC		
Diagnosis Procedure	868	P0452 EVAP CONTROL SYSTEM PRES-		
Component Inspection	870	SURE SENSOR		EC
		Description	912	
P0340, P0345 CMP SENSOR		DTC Logic		
Description		Diagnosis Procedure		
DTC Logic		Component Inspection	916	C
Diagnosis Procedure		P0453 EVAP CONTROL SYSTEM PRES-		
Component Inspection	875	SURE SENSOR	047	
P0420, P0430 THREE WAY CATALYST			_	
FUNCTION	077	Description		
		DTC Logic		
DTC Logic		Diagnosis Procedure		Е
Component Function Check		Component Inspection	921	
Diagnosis Procedure	879	P0455 EVAP CONTROL SYSTEM	923	
P0441 EVAP CONTROL SYSTEM	882	DTC Logic		F
DTC Logic		Diagnosis Procedure		
Component Function Check		Component Inspection		
Diagnosis Procedure				
2.ag.100.0 1 100000.0	00 .	P0456 EVAP CONTROL SYSTEM	929	G
P0442 EVAP CONTROL SYSTEM	887	DTC Logic	929	
DTC Logic	887	Component Function Check	931	
Diagnosis Procedure	888	Diagnosis Procedure	931	\vdash
Component Inspection	892	Component Inspection	935	
		D0 400 EUEL 1 EVEL 0EN00D		
P0443 EVAP CANISTER PURGE VOLUME		P0460 FUEL LEVEL SENSOR		-
CONTROL SOLENOID VALVE		Description		
Description		DTC Logic		
DTC Logic		Diagnosis Procedure	936	
Diagnosis Procedure		P0461 FUEL LEVEL SENSOR	938	J
Component Inspection	896	Description		
P0444, P0445 EVAP CANISTER PURGE		DTC Logic		
VOLUME CONTROL SOLENOID VALVE	909	Component Function Check		K
Description		Diagnosis Procedure		
DTC Logic		· ·		
		P0462, P0463 FUEL LEVEL SENSOR	940	
Diagnosis Procedure Component Inspection		Description		
Component inspection	900	DTC Logic	940	
P0447 EVAP CANISTER VENT CONTROL		Diagnosis Procedure	940	IV
VALVE	901	B0500 V00		
Description		P0500 VSS		
DTC Logic		Description		
Diagnosis Procedure		DTC Logic		Ν
Component Inspection		Component Function Check		
·		Diagnosis Procedure	943	
P0448 EVAP CANISTER VENT CONTROL		P0506 ISC SYSTEM	944	С
VALVE	905	Description		
Description	905	DTC Logic		
DTC Logic	905	Diagnosis Procedure		Р
Diagnosis Procedure		Diagnosis i rocedure	3 44	
Component Inspection	907	P0507 ISC SYSTEM	946	
DOLEA EVAD CONTROL OVOTER DDEC		Description		
P0451 EVAP CONTROL SYSTEM PRES-		DTC Logic		
SURE SENSOR		Diagnosis Procedure		
Description		-		
DTC Logic	909	P0524 ENGINE OIL PRESSURE	948	

DTC Logic	948	P1090, P1093 VVEL ACTUATOR MOTOR	979
Diagnosis Procedure	949	Description	
		DTC Logic	
P0550 PSP SENSOR		Diagnosis Procedure	
Description		Component Inspection (VVEL ACTUATOR MO-	
DTC Logic		TOR)	981
Diagnosis Procedure		Component Inspection (VVEL ACTUATOR SUB	
Component Inspection	952	ASSEMBLY)	
DOCO2 FOM DOWED CUDDLY	054	Special Repair Requirement	
P0603 ECM POWER SUPPLY			
Description		P1091 VVEL ACTUATOR MOTOR RELAY	983
DTC Logic		Description	. 983
Diagnosis Procedure	954	DTC Logic	. 983
P0605 ECM	956	Diagnosis Procedure	. 983
Description		Component Inspection	. 985
•			
DTC Logic Diagnosis Procedure		P1148, P1168 CLOSED LOOP CONTROL	
Diagnosis Procedure	957	DTC Logic	. 986
P0607 ECM	958	P1211 TCS CONTROL UNIT	007
Description			
DTC Logic		Description	
Diagnosis Procedure		DTC Logic	
Diagnosis i recodure		Diagnosis Procedure	. 987
P0643 SENSOR POWER SUPPLY	959	P1212 TCS COMMUNICATION LINE	988
DTC Logic	959	Description	
Diagnosis Procedure	959	DTC Logic	
•		Diagnosis Procedure	
P0850 PNP SWITCH		Diagnosis Flocedule	. 900
Description	962	P1217 ENGINE OVER TEMPERATURE	989
DTC Logic		DTC Logic	
Component Function Check	963	Component Function Check	
Diagnosis Procedure	963	Diagnosis Procedure	
DAGGA DAGGD VIVEL CVCTEM		-	
P100A, P100B VVEL SYSTEM		P1220 FUEL PUMP CONTROL MODULE	
DTC Logic		(FPCM)	993
Diagnosis Procedure		Description	. 993
Component Inspection (VVEL ACTUATOR MO-		DTC Logic	. 993
TOR)		Diagnosis Procedure	993
Component Inspection (VVEL ACTUATOR SUE		Component Inspection	
ASSEMBLY)			
Special Repair Requirement	968	P1225, P1234 TP SENSOR	
P1078, P1084 EVT CONTROL POSITION		Description	
SENSOR	060	DTC Logic	
		Diagnosis Procedure	
Description		Special Repair Requirement	. 997
DTC Logic		DADOC DADOE TO CENCOD	
Diagnosis Procedure		P1226, P1235 TP SENSOR	
Component Inspection	972	Description	
P1087, P1088 VVEL SYSTEM	974	DTC Logic	
DTC Logic		Diagnosis Procedure	
D. O Logio	914	Special Repair Requirement	. 999
P1089, P1092 VVEL CONTROL SHAFT PO-	•	P1233, P2101 ELECTRIC THROTTLE CON-	
SITION SENSOR		TROL FUNCTION	1000
Description			
DTC Logic		Description	
Diagnosis Procedure	975	DTC Logic	
Special Repair Requirement		Diagnosis Procedure	1000
. , ,		Component Inspection	1003
		JORGAL KROM KROMENEN	11111

P1236, P2118 THROTTLE CONTROL MO-	DTC Logic1034	
TOR1004	Diagnosis Procedure1034	
Description1004	Component Inspection1036	
DTC Logic1004	DAECA ICO STEEDING SWITCH	
Diagnosis Procedure1004	P1564 ICC STEERING SWITCH1037	E
Component Inspection1005	Description	
Special Repair Requirement1006	Diagnosis Procedure1037	
P1238, P2119 ELECTRIC THROTTLE CON-	Component Inspection	(
TROL ACTUATOR1007		
Description	P1568 ICC FUNCTION1040	
DTC Logic1007	DTC Logic1040	Г
Diagnosis Procedure1008	Diagnosis Procedure1040	L
Special Repair Requirement1008	P1572 ASCD BRAKE SWITCH1041	
	Description	[
P1239, P2135 TP SENSOR1009	DTC Logic1041	
Description1009	Diagnosis Procedure1042	
DTC Logic	Component Inspection (ASCD Brake Switch)1045	
Diagnosis Procedure	Component Inspection (Stop Lamp Switch)1045	ı
Component Inspection		
Special Repair Requirement1011	P1572 ICC BRAKE SWITCH1046	
P1290, P2100, P2103 THROTTLE CONTROL	Description	(
MOTOR RELAY1012	DTC Logic	
Description1012	Diagnosis Procedure1047 Component Inspection (ICC Brake Switch)1050	
DTC Logic1012	Component Inspection (ICC Brake Switch)1050 Component Inspection (Stop Lamp Switch)1051	ŀ
Diagnosis Procedure1012	Component inspection (Stop Lamp Switch)1031	
DA 404 COLD STADT CONTDOL	P1574 ASCD VEHICLE SPEED SENSOR1052	
P1421 COLD START CONTROL1014	Description1052	
Description	DTC Logic1052	
DTC Logic1014 Diagnosis Procedure1014	Diagnosis Procedure1052	
Diagnosis i rocedure1014	P1574 ICC VEHICLE SPEED SENSOR1054	,
P1550 BATTERY CURRENT SENSOR1016	Description	
Description1016	DTC Logic1054	
DTC Logic1016	Diagnosis Procedure1054	ŀ
Diagnosis Procedure1017	•	
Component Inspection1019	P1606 VVEL CONTROL MODULE1056	
P1551, P1552 BATTERY CURRENT SEN-	Description1056	
SOR1020	DTC Logic	
Description1020	Diagnosis Procedure1056	
DTC Logic1020	P1607 VVEL CONTROL MODULE1058	
Diagnosis Procedure1021	Description1058	
Component Inspection1023	DTC Logic1058	
DATES DATTEDY CURRENT CENCOR	Diagnosis Procedure1058	1
P1553 BATTERY CURRENT SENSOR1025	D4C00 VVEL CENCOD DOWED CURRLY 4000	
Description	P1608 VVEL SENSOR POWER SUPPLY1060	
DTC Logic1025 Diagnosis Procedure1026	DTC Logic	(
Component Inspection	Diagnosis Procedure	
Tomponone mopoulon1020	Special Repair Requirement1061	
P1554 BATTERY CURRENT SENSOR1029	P1715 INPUT SPEED SENSOR1063	F
Description1029	Description1063	
DTC Logic1029	DTC Logic1063	
Component Function Check1029	Diagnosis Procedure1063	
Diagnosis Procedure1030	D1905 DDAKE SWITCH	
Component Inspection1032	P1805 BRAKE SWITCH1064	
P1564 ASCD STEERING SWITCH1034	Description	
Description 1034	D10 Logic1064	

Diagnosis Procedure	1064	Diagnosis Procedure	1099
Component Inspection (Stop Lamp Switch)	1065	Component Inspection	1101
P2122, P2123 APP SENSOR		ICC BRAKE SWITCH	
Description		Description	
DTC Logic		Component Function Check	
Diagnosis Procedure		Diagnosis Procedure	
Component Inspection		Component Inspection (ICC Brake Switch)	
Special Repair Requirement	.1070	Component Inspection (ICC Brake Hold Relay)	.1105
P2127, P2128 APP SENSOR		IGNITION SIGNAL	
Description		Description	
DTC Logic		Component Function Check	1107
Diagnosis Procedure		Diagnosis Procedure	
Component Inspection		Component Inspection (Ignition Coil with Power	
Special Repair Requirement	1075	Transistor)	
P2138 APP SENSOR	1076	Component Inspection (Condenser)	1111
Description		INFORMATION DISPLAY (ASCD)	1112
DTC Logic		Description	
Diagnosis Procedure		Component Function Check	
Component Inspection		Diagnosis Procedure	
Special Repair Requirement		Diagnosis Frocedure	
Special Repair Requirement	1000	MALFUNCTION INDICATOR LAMP	1113
P2A00, P2A03 A/F SENSOR 1	.1081	Description	1113
Description		Component Function Check	
DTC Logic		Diagnosis Procedure	
Diagnosis Procedure		-	
-		MANIFOLD PRESSURE SENSOR	1114
ASCD BRAKE SWITCH	.1085	Description	
Description	.1085	Component Function Check	
Component Function Check	.1085	Diagnosis Procedure	1114
Diagnosis Procedure	.1085	Component Inspection	1115
Component Inspection (ASCD Brake Switch)	.1086	ON BOARD REFUELING VAPOR RECOV-	
ASCD INDICATOR	1000		4440
Description		ERY (ORVR)	
Component Function Check		Description	
·		Component Function Check	
Diagnosis Procedure	1088	Diagnosis Procedure	
COOLING FAN	.1089	Component Inspection	1119
Description	.1089	POSITIVE CRANKCASE VENTILATION	1120
Component Function Check	.1089	Description	1120
Diagnosis Procedure	.1089	Component Inspection	
Component Inspection (Cooling Fan Motor)	.1092		
Component Inspection (Cooling Fan Relay)	.1093	REFRIGERANT PRESSURE SENSOR	
		Description	
ELECTRICAL LOAD SIGNAL		Component Function Check	
Description		Diagnosis Procedure	1122
Component Function Check		ONOW MODE OWITOU	
Diagnosis Procedure	1094	SNOW MODE SWITCH	
FUEL IN IECTOR	4000	Description	
FUEL INJECTOR		Component Function Check	
Description		Diagnosis Procedure	
Component Function Check		Component Inspection	1126
Diagnosis Procedure		ECH DIAGNOSIS INEODMATION	440-
Component Inspection	.1098	ECU DIAGNOSIS INFORMATION	1127
FUEL PUMP	.1099	ECM	
Description		Reference Value	1127
Component Function Check		Wiring Diagram - ENGINE CONTROL SYSTEM	

Fail-safe1168	PREPARATION1226
DTC Inspection Priority Chart1171	DDED A DATION
DTC Index1172	PREPARATION1226
How to Set SRT Code1177	Special Service Tools1226
Test Value and Test Limit1179	Commercial Service Tools1226
VVEL CONTROL MODULE1186	PERIODIC MAINTENANCE1228
Reference Value1186	FUEL DRECOURE
Wiring Diagram - ENGINE CONTROL SYSTEM -1190	FUEL PRESSURE1228
OVERTON DIA ONOGIO	Inspection1228
SYMPTOM DIAGNOSIS1215	EVAP LEAK CHECK1229
ENGINE CONTROL SYSTEM SYMPTOMS1215	Inspection
Symptom Table1215	1110p00t10111220
Symptom rable1215	REMOVAL AND INSTALLATION1231
NORMAL OPERATING CONDITION1220	
Description1220	EVAP CANISTER1231
·	Exploded View1231
PRECAUTION1221	Removal and Installation1231
DDECALITIONS 1001	Inspection1232
PRECAUTIONS1221	SEDVICE DATA AND SDECIFICATIONS
Precaution for Supplemental Restraint System	SERVICE DATA AND SPECIFICATIONS
(SRS) "AIR BAG" and "SEAT BELT PRE-TEN-	(SDS)1233
SIONER"	SERVICE DATA AND SPECIFICATIONS
Precaution for Procedure without Cowl Top Cover1221	
Precautions For Xenon Headlamp Service1221	(SDS)1233
On Board Diagnostic (OBD) System of Engine	Idle Speed
and A/T	Ignition Timing
General Precautions1222	Calculated Load Value
	Mass Air Flow Sensor1233

Α

EC

С

D

Е

F

G

Н

J

Κ

L

M

Ν

0

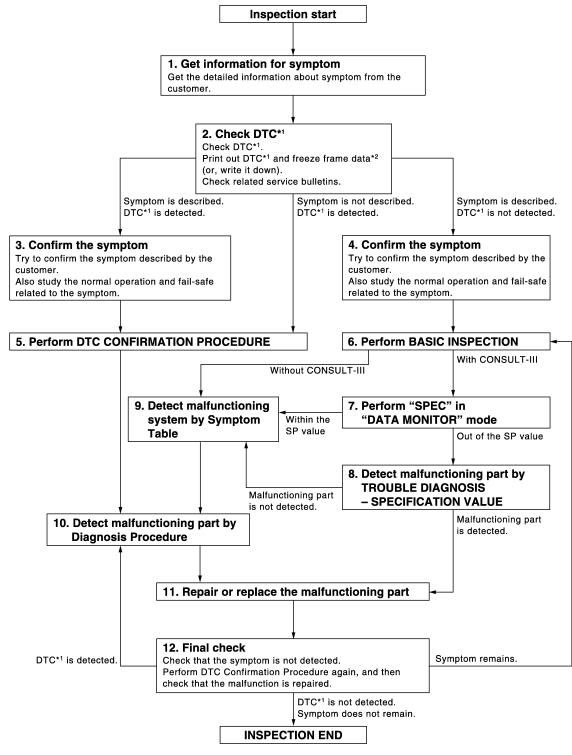
< BASIC INSPECTION > [VQ35HR]

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

OVERALL SEQUENCE



^{*1:} Include 1st trip DTC.

JMBIA1416GB

^{*2:} Include 1st trip freeze frame data.

DIAGNOSIS AND REPAIR WORKFLOW

[VQ35HR1 < BASIC INSPECTION >

1.GET INFORMATION FOR SYMPTOM

Get the detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred) using the "Diagnostic Work Sheet". (Refer to EC-19, "Diagnostic Work Sheet".)

EC

Α

>> GO TO 2.

2.CHECK DTC

1. Check DTC.

- 2. Perform the following procedure if DTC is displayed.
- Record DTC and freeze frame data. (Print them out with CONSULT-III or GST.)
- Erase DTC. (Refer to EC-111, "Diagnosis Description".)
- Study the relationship between the cause detected by DTC and the symptom described by the customer. (Symptom Matrix Chart is useful. Refer to EC-555, "Symptom Table".)
- Check related service bulletins for information.

Are any symptoms described and is any DTCs detected?

Symptom is described, DTC is detected>>GO TO 3.

Symptom is described, DTC is not detected>>GO TO 4.

Symptom is not described, DTC is detected>>GO TO 5.

3.CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer (except MIL ON).

Also study the normal operation and fail-safe related to the symptom. Refer to EC-559, "Description" and EC-538, "Fail-safe".

Diagnosis Work Sheet is useful to verify the incident.

Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 5.

4. CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer.

Also study the normal operation and fail-safe related to the symptom. Refer to EC-559, "Description" and EC-538, "Fail-safe".

Diagnosis Work Sheet is useful to verify the incident.

Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 6.

$oldsymbol{5}$.PERFORM DTC CONFIRMATION PROCEDURE

Perform DTC CONFIRMATION PROCEDURE for the displayed DTC, and then check that DTC is detected again.

If two or more DTCs are detected, refer to EC-540, "DTC Inspection Priority Chart" and determine trouble diagnosis order.

NOTE:

- Freeze frame data is useful if the DTC is not detected.
- Perform Component Function Check if DTC CONFIRMATION PROCEDURE is not included on Service Manual. This simplified check procedure is an effective alternative though DTC cannot be detected during this check.

If the result of Component Function Check is NG, it is the same as the detection of DTC by DTC CONFIR-MATION PROCEDURE.

Is DTC detected?

YES >> GO TO 10.

NO >> Check according to GI-35, "Intermittent Incident".

PERFORM BASIC INSPECTION

Perform EC-20, "BASIC INSPECTION: Special Repair Requirement".

Will CONSULT-III be used?

EC-17 Revision: 2009 March 2009 FX35/FX50

Е

Н

Ν

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION > [VQ35HR]

YES >> GO TO 7. NO >> GO TO 9.

7. PERFORM SPEC IN DATA MONITOR MODE

(P)With CONSULT-III

Check that "MAS A/F SE-B1", "MAS A/F SE-B2", "B/FUEL SCHDL", "A/F ALPHA-B1" and "A/F ALPHA-B2" are within the SP value using CONSULT-III "SPEC" in "DATA MONITOR" mode. Refer to EC-136, "Component Function Check".

Is the measurement value within the SP value?

YES >> GO TO 9. NO >> GO TO 8.

8 DETECT MALFUNCTIONING PART BY TROUBLE DIAGNOSIS - SPECIFICATION VALUE

Detect malfunctioning part according to EC-137, "Diagnosis Procedure".

Is a malfunctioning part detected?

YES >> GO TO 11. NO >> GO TO 9.

9. DETECT MALFUNCTIONING SYSTEM BY SYMPTOM TABLE

Detect malfunctioning system according to <u>EC-555</u>, "<u>Symptom Table</u>" based on the confirmed symptom in step 4, and determine the trouble diagnosis order based on possible causes and symptoms.

>> GO TO 10.

10. DETECT MALFUNCTIONING PART BY DIAGNOSIS PROCEDURE

Inspect according to Diagnosis Procedure of the system.

NOTE:

The Diagnosis Procedure in EC section described based on open circuit inspection. A short circuit inspection is also required for the circuit check in the Diagnosis Procedure. For details, refer to GI-38. "Circuit Inspection".

Is a malfunctioning part detected?

YES >> GO TO 11.

NO >> Monitor input data from related sensors or check voltage of related ECM terminals using CON-SULT-III. Refer to EC-501, "Reference Value".

11. REPAIR OR REPLACE THE MALFUNCTIONING PART

- 1. Repair or replace the malfunctioning part.
- Reconnect parts or connectors disconnected during Diagnosis Procedure again after repair and replacement
- 3. Check DTC. If DTC is displayed, erase it. Refer to EC-111, "Diagnosis Description".

>> GO TO 12.

12.FINAL CHECK

When DTC was detected in step 2, perform DTC CONFIRMATION PROCEDURE or Component Function Check again, and then check that the malfunction have been completely repaired.

When symptom was described from the customer, refer to confirmed symptom in step 3 or 4, and check that the symptom is not detected.

Is DTC detected and does symptom remain?

YES-1 >> DTC is detected: GO TO 10.

YES-2 >> Symptom remains: GO TO 6.

NO >> Before returning the vehicle to the customer, always erase unnecessary DTC in ECM and TCM (Transmission Control Module). (Refer to EC-111, "Diagnosis Description".) If the completion of SRT is needed, drive vehicle under the specific driving pattern. Refer to EC-546. "How to Set SRT Code".

Diagnostic Work Sheet

INFOID:0000000003855977

DESCRIPTION

There are many operating conditions that lead to the malfunction of engine components. A good grasp of such conditions can make troubleshooting faster and more accurate.

In general, each customer feels differently about an incident. It is important to fully understand the symptoms or conditions for a customer complaint.

Utilize a diagnostic worksheet like the WORKSHEET SAMPLE below in order to organize all the information for troubleshooting. Some conditions may cause the MIL to come on steady or blink, and DTC to be detected. Examples:

- Vehicle ran out of fuel, which caused the engine to misfire.
- Fuel filler cap was left off or incorrectly screwed on, allowing fuel to evaporate into the atmosphere.

KEY POINTS

WHAT Vehicle & engine model
WHEN Date, Frequencies
WHERE..... Road conditions
HOW Operating conditions,
Weather conditions,

Symptoms

SEF907L

WORKSHEET SAMPLE

Customer nar	me MR/MS	Model & Year	VIN				
Engine #		Trans.	Mileage				
Incident Date		Manuf. Date	In Service Date				
Fuel and fuel	filler cap	☐ Vehicle ran out of fuel causing misfire ☐ Fuel filler cap was left off or incorrectly screwed on.					
	☐ Startability	☐ Impossible to start ☐ No combustion ☐ Partial combustion ☐ Partial combustion affected by throttle position ☐ Partial combustion NOT affected by throttle position ☐ Possible but hard to start ☐ Others []					
Symptoms	□ Idling	☐ No fast idle ☐ Unstable ☐ High idle ☐ Low idle ☐ Others []					
Cymptome	☐ Driveability	☐ Stumble ☐ Surge ☐ Knock ☐ Lack of power ☐ Intake backfire ☐ Exhaust backfire ☐ Others []					
	☐ Engine stall	☐ At the time of start ☐ While idling ☐ While accelerating ☐ While dece	elerating				
Incident occu	rrence	☐ In the daytime					
Frequency		☐ All the time ☐ Under certain conditions ☐ Sometimes					
Weather conditions		☐ Not affected					
Weather		☐ Fine ☐ Raining ☐ Snowing ☐ Others []					
	Temperature	☐ Hot ☐ Warm ☐ Cool ☐	Cold Humid °F				
		☐ Cold ☐ During warm-up ☐	After warm-up				
Engine conditions		Engine speed0 2,000	4,000 6,000 8,000 rpm				
Road condition	nhway 🗌 Off road (up/down)						
Driving conditions		 Not affected At starting While idling While accelerating While cruising While decelerating While turning (RH/LH) 					
		Vehicle speed					
Malfunction indicator lamp ☐ Turned on ☐ Not turned on							

MTBL0017

Revision: 2009 March EC-19 2009 FX35/FX50

EC

Α

C

D

F

Н

K

L

M

Ν

0

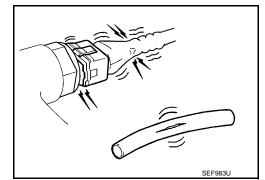
INSPECTION AND ADJUSTMENT BASIC INSPECTION

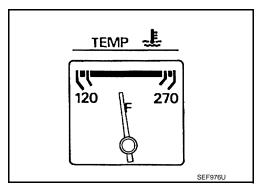
BASIC INSPECTION: Special Repair Requirement

INFOID:0000000003855978

1. INSPECTION START

- 1. Check service records for any recent repairs that may indicate a related malfunction, or a current need for scheduled maintenance.
- 2. Open engine hood and check the following:
- Harness connectors for improper connections
- Wiring harness for improper connections, pinches and cut
- Vacuum hoses for splits, kinks and improper connections
- Hoses and ducts for leakage
- Air cleaner clogging
- Gasket
- 3. Check that electrical or mechanical loads are not applied.
- Headlamp switch is OFF.
- Air conditioner switch is OFF.
- Rear window defogger switch is OFF.
- Steering wheel is in the straight-ahead position, etc.
- Start engine and warm it up until engine coolant temperature indicator points to the middle of gauge. Ensure engine stays below 1,000 rpm.

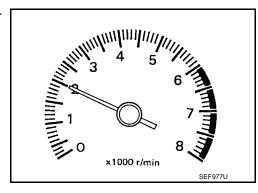




- 5. Run engine at approximately 2,000 rpm for approximately 2 minutes under no load.
- 6. Check that no DTC is displayed with CONSULT-III or GST.

Are any DTCs detected?

YES >> GO TO 2. NO >> GO TO 3.



2. REPAIR OR REPLACE

Repair or replace components as necessary according to corresponding Diagnosis Procedure.

>> GO TO 3

3. CHECK IDLE SPEED

1. Run engine at approximately 2,000 rpm for approximately 2 minutes under no load.

[VQ35HR] < BASIC INSPECTION >

Rev engine (2,000 to 3,000 rpm) 2 or 3 times under no load, then run engine at idle speed for approximately 1 minute.

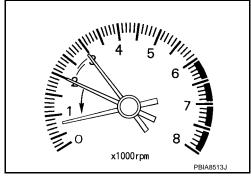
Check idle speed.

For procedure, refer to EC-24, "IDLE SPEED: Special Repair Requirement".

For specification, refer to EC-572, "Idle Speed".

Is the inspection result normal?

YES >> GO TO 10. NO >> GO TO 4.



f 4.PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING

- Stop engine.
- 2. Perform EC-25, "ACCELERATOR PEDAL RELEASED POSITION LEARNING: Special Repair Require-

>> GO TO 5.

${f 5}$.PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Perform EC-25, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement".

>> GO TO 6.

6.PERFORM IDLE AIR VOLUME LEARNING

Perform EC-25, "IDLE AIR VOLUME LEARNING: Special Repair Requirement".

Is Idle Air Volume Learning carried out successfully?

YES >> GO TO 7.

NO >> Follow the instruction of Idle Air Volume Learning. Then GO TO 4.

7. CHECK IDLE SPEED AGAIN

- Start engine and warm it up to normal operating temperature.
- 2. Check idle speed.

For procedure, refer to EC-24, "IDLE SPEED: Special Repair Requirement".

For specification, refer to EC-572, "Idle Speed".

Is the inspection result normal?

YES >> GO TO 10.

NO >> GO TO 8.

8.DETECT MALFUNCTIONING PART

Check the Following.

- Check camshaft position sensor and circuit. Refer to <u>EC-279</u>, "Component Inspection".
- Check crankshaft position sensor and circuit. Refer to <u>EC-273</u>. "Component Inspection".

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair or replace malfunctioning part. Then GO TO 4.

9. CHECK ECM FUNCTION

- Substitute with a non-malfunctioning ECM to check ECM function. (ECM may be the cause of the incident, although this is rare.)
- 2. Perform initialization of IVIS (NATS) system and registration of all IVIS (NATS) ignition key IDs. Refer to SEC-8, "ECM RE-COMMUNICATING FUNCTION: Special Repair Requirement".

>> GO TO 4.

10. CHECK IGNITION TIMING

- Run engine at idle.
- Check ignition timing with a timing light.

Α

EC

D

F

N

EC-21

Revision: 2009 March

[VQ35HR]

< BASIC INSPECTION >

For procedure, refer to EC-24, "IGNITION TIMING: Special Repair Requirement".

For specification, refer to EC-572, "Ignition Timing".

Is the inspection result normal?

YES >> GO TO 19. NO >> GO TO 11.

11. PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING

- Stop engine.
- Perform <u>EC-25</u>, "ACCELERATOR PEDAL RELEASED POSITION LEARNING: Special Repair Requirement".

>> GO TO 12.

12. PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Perform EC-25, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement".

>> GO TO 13.

13. PERFORM IDLE AIR VOLUME LEARNING

Perform EC-25, "IDLE AIR VOLUME LEARNING: Special Repair Requirement".

Is Idle Air Volume Learning carried out successfully?

YES >> GO TO 14.

NO >> Follow the instruction of Idle Air Volume Learning. Then GO TO 4.

14. CHECK IDLE SPEED AGAIN

- 1. Start engine and warm it up to normal operating temperature.
- Check idle speed.

For procedure, refer to EC-24, "IDLE SPEED: Special Repair Requirement".

For specification, refer to EC-572, "Idle Speed".

Is the inspection result normal?

YES >> GO TO 15. NO >> GO TO 17.

15. CHECK IGNITION TIMING AGAIN

- 1. Run engine at idle.
- 2. Check ignition timing with a timing light.

For procedure, refer to EC-24, "IGNITION TIMING: Special Repair Requirement".

For specification, refer to EC-572, "Ignition Timing".

Is the inspection result normal?

YES >> GO TO 19. NO >> GO TO 16.

16. CHECK TIMING CHAIN INSTALLATION

Check timing chain installation. Refer to EM-54, "Removal and Installation".

Is the inspection result normal?

YES >> GO TO 17.

NO >> Repair the timing chain installation. Then GO TO 4.

17. DETECT MALFUNCTIONING PART

Check the following.

- Check camshaft position sensor and circuit. Refer to <u>EC-279</u>, "Component Inspection".
- Check crankshaft position sensor and circuit. Refer to EC-273, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 18.

NO >> Repair or replace malfunctioning part. Then GO TO 4.

18. CHECK ECM FUNCTION

< BASIC INSPECTION > [VQ35HR]

1. Substitute with a non-malfunctioning ECM to check ECM function. (ECM may be the cause of the incident, although this is rare.)

2. Perform initialization of IVIS (NATS) system and registration of all IVIS (NATS) ignition key IDs. Refer to SEC-8, "ECM RE-COMMUNICATING FUNCTION: Special Repair Requirement".

EC

>> GO TO 4.

19. INSPECTION END

If ECM is replaced during this BASIC INSPECTION procedure, go to <u>EC-23</u>, "ADDITIONAL SERVICE WHEN <u>REPLACING CONTROL UNIT</u>: Special Repair Requirement".

D

Е

>> INSPECTION END

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT: Description

INFOID:0000000003855979

When replacing ECM, the following procedure must be performed.

F

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT: Special Repair Requirement

G

1.PERFORM INITIALIZATION OF IVIS (NATS) SYSTEM AND REGISTRATION OF ALL IVIS (NATS) IGNITION KEY IDS

Ш

Refer to SEC-8, "ECM RE-COMMUNICATING FUNCTION: Special Repair Requirement".

>> GO TO 2.

2. PERFORM VIN REGISTRATION

Refer to EC-24, "VIN REGISTRATION: Special Repair Requirement".

.

>> GO TO 3.

3.PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING

K

Refer to EC-25, "ACCELERATOR PEDAL RELEASED POSITION LEARNING: Special Repair Requirement"

L

>> GO TO 4.

4.PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Refer to EC-25, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement".

M

>> GO TO 5.

5. PERFORM IDLE AIR VOLUME LEARNING

N

Refer to EC-25, "IDLE AIR VOLUME LEARNING: Special Repair Requirement".

0

>> GO TO 6.

6. PERFORM EXHAUST VALVE TIMING CONTROL LEARNING

Refer to EC-27, "EXHAUST VALVE TIMING CONTROL LEARNING: Special Repair Requirement".

>> END
IDLE SPEED

Revision: 2009 March

< BASIC INSPECTION > [VQ35HR]

IDLE SPEED: Description

INFOID:0000000003855981

This describes how to check the idle speed. For the actual procedure, follow the instructions in "BASIC INSPECTION".

IDLE SPEED: Special Repair Requirement

INFOID:0000000003855982

1.CHECK IDLE SPEED

With CONSULT-III

Check idle speed in "DATA MONITOR" mode with CONSULT-III.

∰With GST

Check idle speed with Service \$01 of GST.

>> INSPECTION END

IGNITION TIMING

IGNITION TIMING: Description

INFOID:0000000003855983

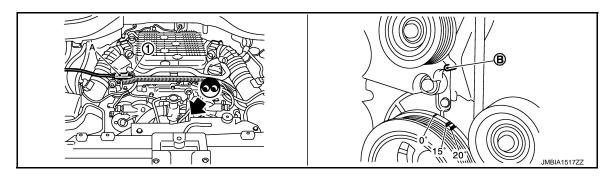
This describes how to check the ignition timing. For the actual procedure, follow the instructions in "BASIC INSPECTION".

IGNITION TIMING: Special Repair Requirement

INFOID:0000000003855984

1. CHECK IGNITION TIMING

1. Attach timing light to loop wire as shown.



- 1. Loop wire
- A. Timing light

- B. Timing indicator
- 2. Check ignition timing.

>> INSPECTION END

VIN REGISTRATION

VIN REGISTRATION : Description

INFOID:0000000003855985

VIN Registration is an operation to register VIN in ECM. It must be performed each time ECM is replaced. **NOTE:**

Accurate VIN which is registered in ECM may be required for Inspection & Maintenance (I/M).

VIN REGISTRATION : Special Repair Requirement

INFOID:0000000003855986

1. CHECK VIN

Check the VIN of the vehicle and note it. Refer to GI-16, "Information About Identification or Model Code".

>> GO TO 2.

[VQ35HR] < BASIC INSPECTION > 2.perform vin registration Α (P)With CONSULT-III 1. Turn ignition switch ON with engine stopped. Select "VIN REGISTRATION" in "WORK SUPPORT" mode. EC Follow the instructions on the CONSULT-III display. >> END ACCELERATOR PEDAL RELEASED POSITION LEARNING ACCELERATOR PEDAL RELEASED POSITION LEARNING: Description INFOID-00000003855997 D Accelerator Pedal Released Position Learning is a function of ECM to learn the fully released position of the accelerator pedal by monitoring the accelerator pedal position sensor output signal. It must be performed each the time harness connector of the accelerator pedal position sensor or ECM is disconnected. Е ACCELERATOR PEDAL RELEASED POSITION LEARNING: Special Repair Requirement INFOID:0000000003855988 1.START Check that accelerator pedal is fully released. Turn ignition switch ON and wait at least 2 seconds. Turn ignition switch OFF and wait at least 10 seconds. 3. Turn ignition switch ON and wait at least 2 seconds. 4. Turn ignition switch OFF and wait at least 10 seconds. >> END THROTTLE VALVE CLOSED POSITION LEARNING THROTTLE VALVE CLOSED POSITION LEARNING: Description INFOID:0000000003855989 Throttle Valve Closed Position Learning is a function of ECM to learn the fully closed position of the throttle valve by monitoring the throttle position sensor output signal. It must be performed each time harness connector of electric throttle control actuator or ECM is disconnected. THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement INFOID:0000000003855990 1.START Check that accelerator pedal is fully released. Turn ignition switch ON. Turn ignition switch OFF and wait at least 10 seconds. Check that throttle valve moves during the above 10 seconds by confirming the operating sound. N >> END IDLE AIR VOLUME LEARNING IDLE AIR VOLUME LEARNING: Description Idle Air Volume Learning is a function of ECM to learn the idle air volume that keeps engine idle speed within the specific range. It must be performed under the following conditions: • Each time electric throttle control actuator or ECM is replaced. Idle speed or ignition timing is out of specification. IDLE AIR VOLUME LEARNING: Special Repair Requirement 1.PRECONDITIONING

Revision: 2009 March EC-25 2009 FX35/FX50

Check that all of the following conditions are satisfied.

< BASIC INSPECTION > [VQ35HR]

Learning will be cancelled if any of the following conditions are missed for even a moment.

- Battery voltage: More than 12.9 V (At idle)
- Engine coolant temperature: 70 105°C (158 221°F)
- Selector lever: P or N
- · Electric load switch: OFF

(Air conditioner, headlamp, rear window defogger)

On vehicles equipped with daytime light systems, if the parking brake is applied before the engine is started the headlamp will not illuminate.

- Steering wheel: Neutral (Straight-ahead position)
- Vehicle speed: Stopped
- Transmission: Warmed-up
- With CONSULT-III: Drive vehicle until "ATF TEMP SE 1" in "DATA MONITOR" mode of "A/T" system indicates less than 0.9 V.
- Without CONSULT-III: Drive vehicle for 10 minutes.

Will CONSULT-III be used?

YES >> GO TO 2. NO >> GO TO 3.

2.perform idle air volume learning

(P)With CONSULT-III

- Perform Accelerator Pedal Released Position Learning. Refer to <u>EC-25</u>. "ACCELERATOR PEDAL <u>RELEASED POSITION LEARNING</u>: <u>Special Repair Requirement"</u>.
- 2. Perform Throttle Valve Closed Position Learning. <u>EC-25</u>, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement".
- 3. Start engine and warm it up to normal operating temperature.
- 4. Select "IDLE AIR VOL LEARN" in "WORK SUPPORT" mode.
- 5. Touch "START" and wait 20 seconds.

Is "CMPLT" displayed on CONSULT-III screen?

YES >> GO TO 4. NO >> GO TO 5.

3.PERFORM IDLE AIR VOLUME LEARNING

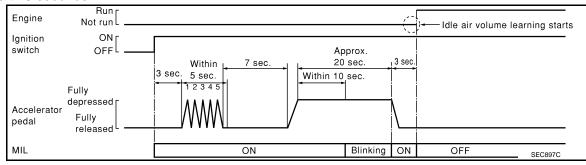
⋈Without CONSULT-III

NOTE:

- It is better to count the time accurately with a clock.
- It is impossible to switch the diagnostic mode when an accelerator pedal position sensor circuit has a malfunction.
- Perform Accelerator Pedal Released Position Learning. Refer to <u>EC-25</u>, "ACCELERATOR PEDAL <u>RELEASED POSITION LEARNING</u>: Special Repair Requirement".
- Perform Throttle Valve Closed Position Learning. <u>EC-25</u>, "THROTTLE VALVE CLOSED POSITION <u>LEARNING</u>: Special Repair Requirement".
- 3. Start engine and warm it up to normal operating temperature.
- Turn ignition switch OFF and wait at least 10 seconds.
- 5. Confirm that accelerator pedal is fully released, turn ignition switch ON and wait 3 seconds.
- 6. Repeat the following procedure quickly 5 times within 5 seconds.
- Fully depress the accelerator pedal.
- Fully release the accelerator pedal.
- 7. Wait 7 seconds, fully depress the accelerator pedal for approx. 20 seconds until the MIL stops blinking and turns ON.
- 8. Fully release the accelerator pedal within 3 seconds after the MIL turns ON.
- Start engine and let it idle.

[VQ35HR] < BASIC INSPECTION >

10. Wait 20 seconds.



>> GO TO 4.

4. CHECK IDLE SPEED AND IGNITION TIMING

Rev up the engine 2 or 3 times and check that idle speed and ignition timing are within the specifications. Refer to EC-572, "Idle Speed" and EC-572, "Ignition Timing".

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 5.

${f 5}$.DETECT MALFUNCTIONING PART-I

Check the following

- Check that throttle valve is fully closed.
- Check PCV valve operation.
- Check that downstream of throttle valve is free from air leakage.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace malfunctioning part.

$\mathsf{6}.\mathsf{DETECT}$ MALFUNCTIONING PART-II

Engine component parts and their installation condition are questionable. Check and eliminate the cause of the incident.

It is useful to perform "TROUBLE DIAGNOSIS - SPECIFICATION VALUE". Refer to EC-136, "Description". If any of the following conditions occur after the engine has started, eliminate the cause of the incident and perform Idle Air Volume Learning again:

- · Engine stalls.
- Incorrect idle.

>> INSPECTION END

EXHAUST VALVE TIMING CONTROL LEARNING

EXHAUST VALVE TIMING CONTROL LEARNING: Description

Exhaust Valve Timing Control Learning is a function of ECM to learn the characteristic of exhaust valve timing control magnet retarder by comparing the target angle of exhaust camshaft with the actual retarded angle of exhaust camshaft. It must be performed each time exhaust valve timing control magnet retarder is disconnected or replaced, or ECM is replaced.

EXHAUST VALVE TIMING CONTROL LEARNING: Special Repair Requirement

INFOID:0000000003855994

1.START

(I) With CONSULT-III

- Start engine and warm it up to normal operating temperature.
- Set selector lever position to N and confirm that the following electrical or mechanical loads are not applied.
- Headlamp switch is OFF

EC

Α

D

Е

F

Н

K

INFOID:0000000003855993

Ν

< BASIC INSPECTION > [VQ35HR]

- Air conditioner switch is OFF
- Rear window defogger switch is OFF
- Steering wheel is in the straight-ahead position, etc.
- 3. Keep the engine speed between 1,800 and 2,000 rpm.
- Select "EXH V/T CONTROL LEARN" in "WORK SUPPORT" mode with CONSULT-III.
- 5. Touch "START" and wait 20 seconds.
- 6. Check that "CMPLT" is displayed on CONSULT-III screen.

Learning completed : CMPLT Learning not yet : YET

(R) Without CONSULT-III

- 1. Start engine and warm it up to normal operating temperature.
- 2. Set selector lever position to N and confirm that the following electrical or mechanical loads are not applied.
- Headlamp switch is OFF
- Air conditioner switch is OFF
- Rear window defogger switch is OFF
- Steering wheel is in the straight-ahead position, etc.
- 3. Keep the engine speed between 1,800 and 2,000 rpm at 20 seconds.

>> END

MIXTURE RATIO SELF-LEARNING VALUE CLEAR

MIXTURE RATIO SELF-LEARNING VALUE CLEAR: Description

This describes how to erase the mixture ratio self-learning value. For the actual procedure, follow the instructions in "Diagnosis Procedure".

MIXTURE RATIO SELF-LEARNING VALUE CLEAR: Special Repair Requirement

INFOID:0000000003855996

INFOID:0000000003855995

1.START

(I) With CONSULT-III

- 1. Start engine and warm it up to normal operating temperature.
- 2. Select "ŠELF-LEARNING CONT" in "WORK SUPPORT" mode with CONSULT-III.
- 3. Clear mixture ratio self-learning value by touching "CLEAR".

With GST

- Start engine and warm it up to normal operating temperature.
- Turn ignition switch OFF.
- Disconnect mass air flow sensor (bank 1) harness connector.
- 4. Restart engine and let it idle for at least 5 seconds.
- 5. Stop engine and reconnect mass air flow sensor (bank 1) harness connector.
- Select Service \$03 with GST. Check DTC P0102 is detected.
- Select Service \$04 with GST to erase the DTC P0102.

>> END

[VQ35HR]

SYSTEM DESCRIPTION

ENGINE CONTROL SYSTEM

System Diagram

INFOID:0000000003855997

Α

C

D

Е

F

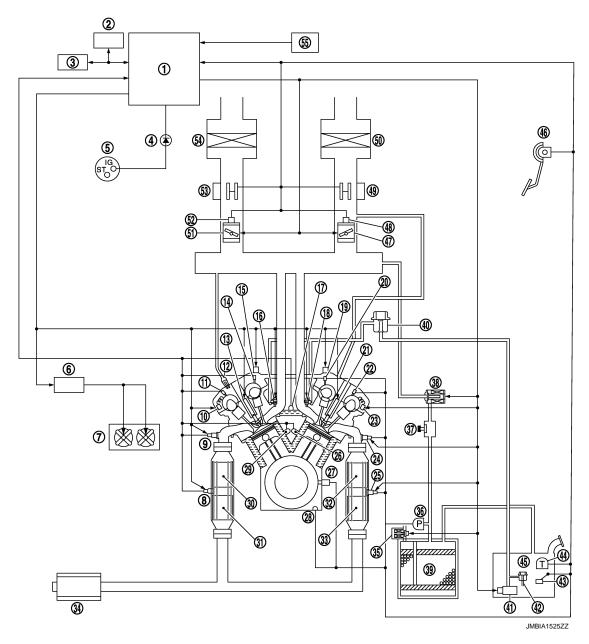
Н

K

M

Ν

Ρ



- 1. ECM
- 4. MIL
- 7. Cooling fan
- Exhaust valve timing control magnet 11.
 retarder (bank 1)
- 13. Spark plug
- 16. Fuel injector
- 19. Intake valve timing control solenoid valve (bank 2)

- 2. Data link connector
- 5. Ignition switch
- 8. Heated oxygen sensor 2 (bank 1)
- Exhaust valve timing control position sensor (bank 1)
- 14. Camshaft position sensor (bank 1)
- 17. Engine coolant temperature sensor
- 20. Camshaft position sensor (bank 2)

- 3. CAN communication
- 6. Cooling fan control module
- 9. A/F sensor 1 (bank 1)
- 12. PCV valve
- 15. Intake valve timing control solenoid valve (bank 1)
- 18. Fuel injector
- 21. Spark plug

Revision: 2009 March EC-29 2009 FX35/FX50

ENGINE CONTROL SYSTEM

< SYSTEM DESCRIPTION >					[VQ35HR]
22. Exhaust valve timing control position	23.	Exhaust valve timing control magnet retarder (bank 2)	24.	A/F sensor 1 (bank 2)	

22.	Exhaust valve timing control position sensor (bank 2)	23.	Exhaust valve timing control magnet retarder (bank 2)	24.	A/F sensor 1 (bank 2)
25.	Heated oxygen sensor 2 (bank 2)	26.	Knock sensor (bank 2)	27.	Crankshaft position sensor
28.	Engine oil temperature sensor	29.	Knock sensor (bank 1)	30.	Three way catalyst 1
31.	Three way catalyst 2	32.	Three way catalyst 1	33.	Three way catalyst 2
34.	Muffler	35.	EVAP canister vent control valve	36.	EVAP control system pressure sensor
37.	EVAP service port	38.	EVAP canister purge volume control solenoid valve	39.	EVAP canister
40.	Fuel damper	41.	Fuel pump	42.	Fuel pressure regulator
43.	Fuel level sensor	44.	Fuel tank temperature sensor	45.	Fuel tank
46.	Accelerator pedal position sensor	47.	Electric throttle control actuator (bank 2)	48.	Throttle position sensor (bank 2)
49.	Mass air flow sensor (with intake air temperature sensor)	50.	Air cleaner (bank 2)	51.	Electric throttle control actuator (bank 1)
52.	Throttle position sensor (bank 1)	53.	Mass air flow sensor (with intake air temperature sensor)	54.	Air cleaner (bank 1)
55.	PNP signal				

System Description

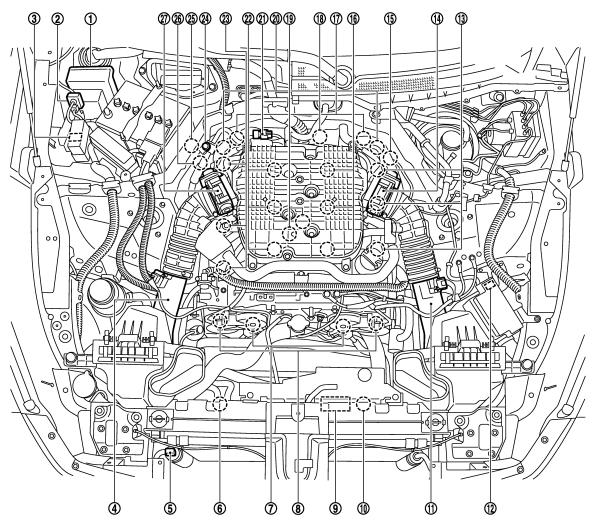
INFOID:0000000003855998

ECM performs various controls such as fuel injection control and ignition timing control.

[VQ35HR]

Component Parts Location

INFOID:0000000003855999



JMBIA1496ZZ

- 1. IPDM E/R
- 4. Mass air flow sensor (with intake air 5. temperature sensor) (bank 1)
- Intake valve timing control solenoid valve
- 10. Cooling fan motor-1
- 13. Ignition coil (with power transistor) and spark plug (bank 2)
- 16. Fuel injector (bank 2)
- 19. Knock sensor
- 22. Fuel injector (bank 1)
- 25. A/F sensor 1 (bank 1)

- 2. Battery current sensor
- 5. Refrigerant pressure sensor
- 8. Exhaust valve timing control magnet 9. retarder
- Mass air flow sensor (with intake air 12. temperature sensor) (bank 2)
- 14. Electric throttle control actuator (bank 2)
- 17. Camshaft position sensor
- 20. Exhaust valve timing control position sensor
- 23. Ignition coil (with power transistor) and spark plug (bank 1)
- 26. Crankshaft position sensor

- Cooling fan relay
- Cooling fan motor-2
- 9. Cooling fan control module
- 12. ICC brake hold relay (ICC models)
- 15. A/F sensor 1 (bank 2)
- 18. Engine coolant temperature sensor
- 21. EVAP canister purge volume control solenoid valve
- 24. EVAP service port
- 27. Electric throttle control actuator (bank 1)

EC

Α

D

Е

F

G

Н

1

K

M

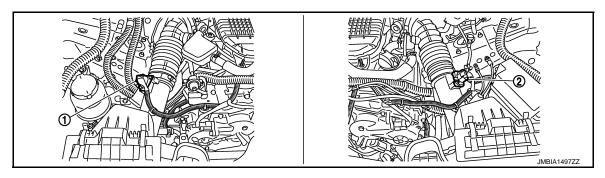
N

0

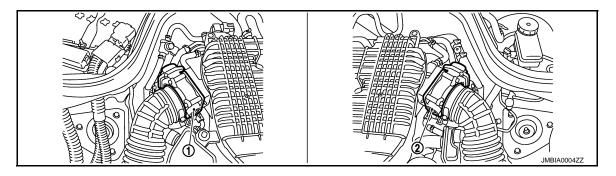
Р

Г

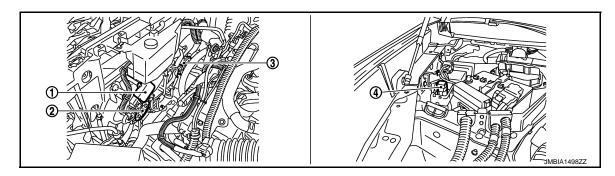
Revision: 2009 March EC-31 2009 FX35/FX50



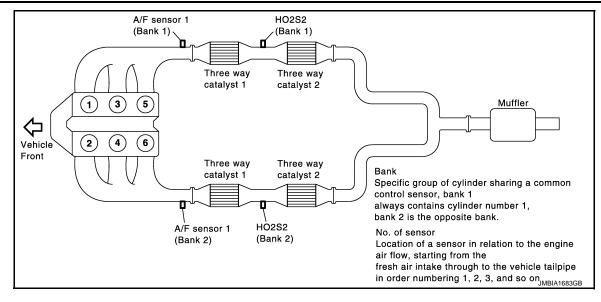
- . Mass air flow sensor (with intake air 2. temperature sensor) (bank 1)
- Mass air flow sensor (with intake air temperature sensor) (bank 2)

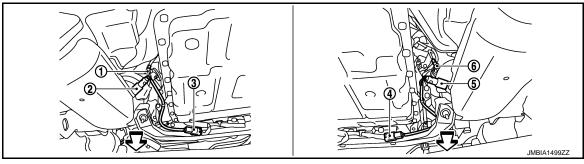


- Electric throttle control actuator (bank 1)
- 2. Electric throttle control actuator (bank 2)



- 1. Cooling fan control module
- Cooling fan relay
- 2. Cooling fan motor-1
- 3. Cooling fan motor-2

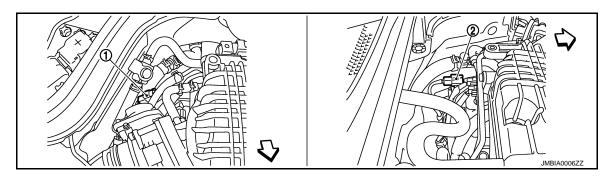




- 1. A/F sensor 1 (bank 2)
- 2. Heated oxygen sensor 2 (bank 2)
- Heated oxygen sensor 2 (bank 2) harness connector

- 4. Heated oxygen sensor 2 (bank 1) harness connector
- 5. Heated oxygen sensor 2 (bank 1)
- 6. A/F sensor 1 (bank 1)

∀
 : Vehicle front



- A/F sensor 1 (bank 1) harness con- 2. nector
 - A/F sensor 1 (bank 2) harness connector

∀ : Vehicle front

Α

EC

C

D

Е

F

G

Н

ı

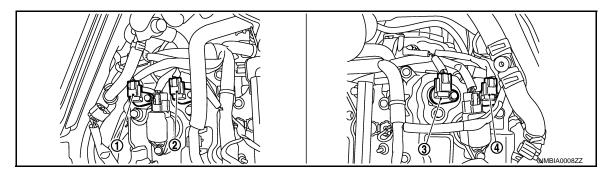
J

K

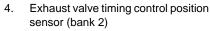
M

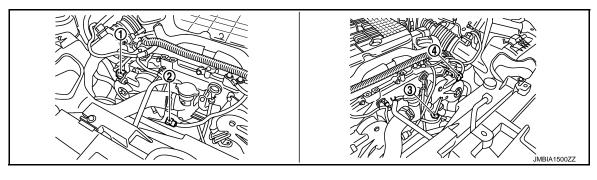
N

 \bigcirc

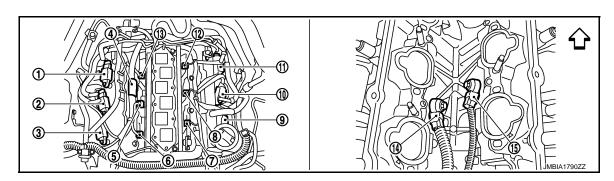


- Exhaust valve timing control position 2. sensor (bank 1)
- Camshaft position sensor (bank 1)
- 3. Camshaft position sensor (bank 2)





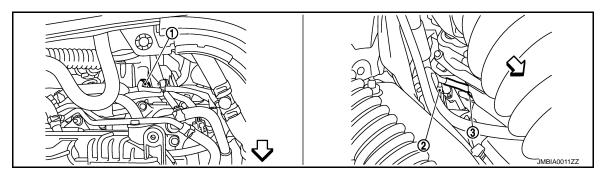
- Exhaust valve timing control magnet 2. retarder (bank 1) harness connector
- 4. Exhaust valve timing control magnet retarder (bank 2) harness connector
- Intake valve timing control solenoid valve (bank 1) harness connector
- Intake valve timing control solenoid valve (bank 2) harness connector



- Ignition coil No.5 (with power transis- 2. 1.
- Condenser 4.
- 7. Fuel injector No.2
- 10. Ignition coil No.4 (with power transis- 11. Ignition coil No.6 (with power transis- 12. Fuel injector No.6 tor)
- 13. Fuel injector No.5

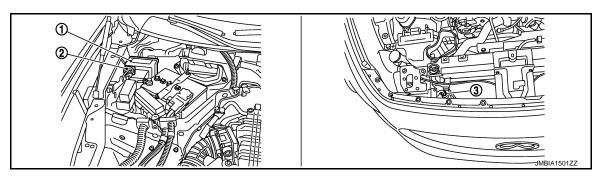
- Ignition coil No.3 (with power transis- 3.
- 5. Fuel injector No.3
- 8. Fuel injector No.4
- tor)
- 14. Knock sensor (bank 2)

- Ignition coil No.1 (with power transis-
- Fuel injector No.1
- Ignition coil No.2 (with power transistor)
- 15. Knock sensor (bank 1)



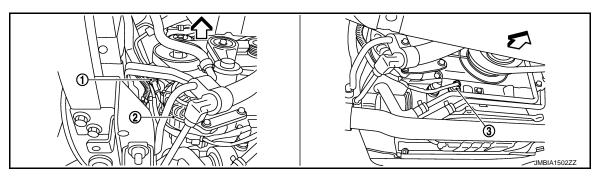
- Engine coolant temperature sensor 2.
 - A/F sensor 1 (bank 1)
- 3. Crankshaft position sensor

⟨□: Vehicle front



1. IPDM E/R

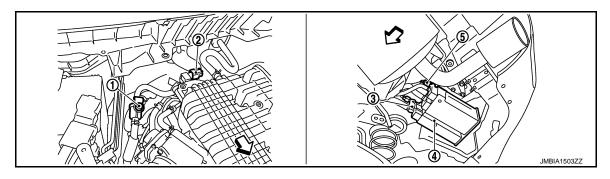
- Battery current sensor
- Refrigerant pressure sensor



- Power steering pressure sensor
- 2. Alternator

Engine oil temperature sensor

∀
 □: Vehicle front



- EVAP service port
- 2. EVAP canister purge volume control 3. EVAP canister vent control valve solenoid valve

EC-35 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

F

G

Н

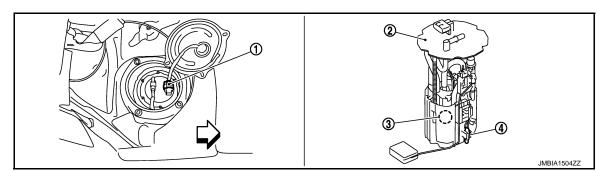
Ν

0

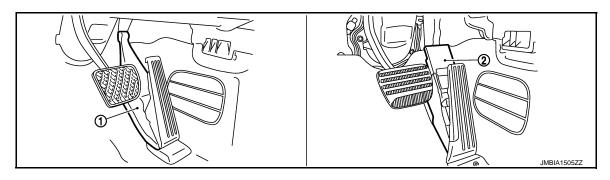
4. EVAP canister

5. EVAP control system pressure sensor

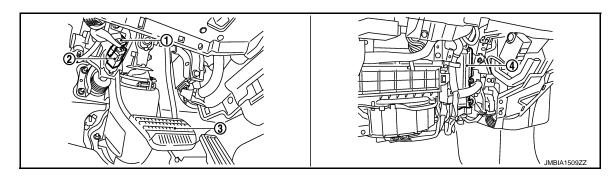
⟨¬: Vehicle front



- Fuel level sensor unit and fuel pump 2. Fuel level sensor unit and fuel pump 3. Fuel pressure regulator harness connector
- 4. Fuel tank temperature sensor
- ∀
 □: Vehicle front



- Accelerator pedal position sensor (Without DCA system)
- Accelerator pedal position sensor (With DCA system)



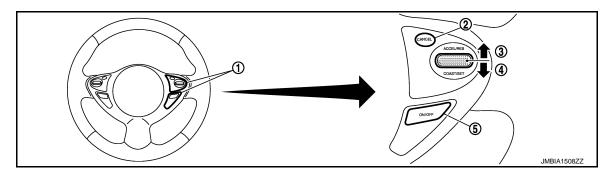
1. Stop lamp switch

ASCD brake switch (ASCD models) 3. Brake pedal ICC brake switch (ICC models)

4. ECM

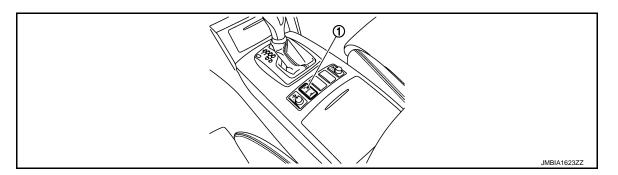
- 1. ICC steering switch
- 4. SET/COAST switch
- 7. LDP switch

- 2. CANCEL switch
- 5. DISTANCE switch
- 3. RESUME/ACCELERATE switch
- 6. MAIN switch



- 1. ASCD steering switch
- 4. SET/COAST switch
- 2. CANCEL switch
- 5. MAIN switch

3. RESUME/ACCELERATE switch



1. Snow mode switch

Component Description

INFOID:0000000003856000

Component	Reference	
A/F sensor 1	EC-202, "Description"	
A/F sensor 1 heater	EC-158, "Description"	
Accelerator pedal position sensor	EC-444, "Description"	
ASCD brake switch	EC-424, "Description"	
ASCD steering switch	EC-417, "Description"	
Battery current sensor	EC-399, "Description"	
Camshaft position sensor	EC-275, "Description"	
Crankshaft position sensor	EC-270, "Description"	

Revision: 2009 March EC-37 2009 FX35/FX50

EC

Α

D

Е

F

G

Н

J

Κ

L

M

Ν

0

ENGINE CONTROL SYSTEM

< SYSTEM DESCRIPTION >

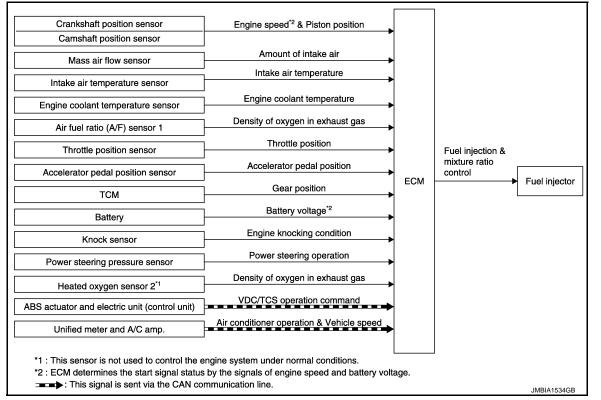
[VQ35HR]

Component	Reference
Cooling fan control module	EC-466, "Description"
Cooling fan motor	EC-466, "Description"
Electric throttle control actuator	EC-390, "Description"
Engine coolant temperature sensor	EC-188, "Description"
Engine oil temperature sensor	EC-251, "Description"
EVAP canister purge volume control solenoid valve	EC-297, "Description"
EVAP canister vent control valve	EC-305, "Description"
EVAP control system pressure sensor	EC-313, "Description"
Exhaust valve timing control magnet retarder	EC-167, "Description"
Exhaust valve timing control position sensor	EC-367, "Description"
Fuel injector	EC-472, "Description"
Fuel level sensor	EC-341, "Description"
Fuel pump	EC-475, "Description"
Fuel tank temperature sensor	EC-245, "Description"
Heated oxygen sensor 2	EC-217, "Description"
Heated oxygen sensor 2 heater	EC-161, "Description"
ICC brake switch	EC-430, "Description"
ICC steering switch	EC-420, "Description"
Ignition coil with power transistor	EC-482, "Description"
Intake air temperature sensor	EC-183, "Description"
Intake valve timing control solenoid valve	EC-164, "Description"
Knock sensor	EC-267, "Description"
Mass air flow sensor	EC-170, "Description"
PCV valve	EC-494, "Description"
Power steering pressure sensor	EC-353, "Description"
Refrigerant pressure sensor	EC-496, "Description"
Snow mode switch	EC-498. "Description"
Stop lamp switch	EC-441, "Description"
Throttle control motor	EC-387, "Description"
Throttle control motor relay	EC-395, "Description"
Throttle position sensor	EC-191, "Description"

[VQ35HR]

MULTIPORT FUEL INJECTION SYSTEM

System Diagram INFOID:0000000003856001



System Description

INFOID:0000000003856002

INPUT/OUTPUT SIGNAL CHART

Sensor	Input Signal to ECM	ECM function	Actuator		
Crankshaft position sensor	_ , , ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				
Camshaft position sensor	Engine speed*3 & Piston position				
Mass air flow sensor	Amount of intake air				
Intake air temperature sensor	Intake air temperature				
Engine coolant temperature sensor	Engine coolant temperature				
Air fuel ratio (A/F) sensor 1	Density of oxygen in exhaust gas	hrottle position ccelerator pedal position ear position attery voltage*3 ngine knocking condition ower steering operation ensity of oxygen in exhaust gas Fuel injection & mixture ratio control Fuel injector			
Throttle position sensor	Throttle position		ion		
Accelerator pedal position sensor	Accelerator pedal position				
TCM	Gear position				
Battery	Battery voltage*3				
Knock sensor	Engine knocking condition				
Power steering pressure sensor	Power steering operation				
Heated oxygen sensor 2*1	Density of oxygen in exhaust gas		n in exhaust gas		
ABS actuator and electric unit (control unit)	VDC/TCS operation command*2				
Unifed meter and A/C amp.	Vehicle speed & Air conditioner operation* ²				

^{*1:} This sensor is not used to control the engine system under normal conditions.

EC-39 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

^{*2:} This signal is sent to the ECM via the CAN communication line.

^{*3:} ECM determines the start signal status by the signals of engine speed and battery voltage.

SYSTEM DESCRIPTION

The amount of fuel injected from the fuel injector is determined by the ECM. The ECM controls the length of time the valve remains open (injection pulse duration). The amount of fuel injected is a program value in the ECM memory. The program value is preset by engine operating conditions. These conditions are determined by input signals (for engine speed and intake air) from the crankshaft position sensor, camshaft position sensor and the mass air flow sensor.

VARIOUS FUEL INJECTION INCREASE/DECREASE COMPENSATION

In addition, the amount of fuel injected is compensated to improve engine performance under various operating conditions as listed below.

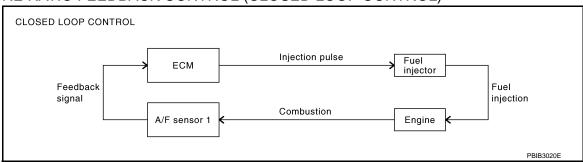
<Fuel increase>

- · During warm-up
- When starting the engine
- During acceleration
- · Hot-engine operation
- When selector lever is changed from N to D
- High-load, high-speed operation

<Fuel decrease>

- During deceleration
- · During high engine speed operation

MIXTURE RATIO FEEDBACK CONTROL (CLOSED LOOP CONTROL)



The mixture ratio feedback system provides the best air-fuel mixture ratio for driveability and emission control. The three way catalyst 1 can better reduce CO, HC and NOx emissions. This system uses A/F sensor 1 in the exhaust manifold to monitor whether the engine operation is rich or lean. The ECM adjusts the injection pulse width according to the sensor voltage signal. For more information about A/F sensor 1, refer to EC-202. "Description". This maintains the mixture ratio within the range of stoichiometric (ideal air-fuel mixture). This stage is referred to as the closed loop control condition.

Heated oxygen sensor 2 is located downstream of the three way catalyst 1. Even if the switching characteristics of A/F sensor 1 shift, the air-fuel ratio is controlled to stoichiometric by the signal from heated oxygen sensor 2.

Open Loop Control

The open loop system condition refers to when the ECM detects any of the following conditions. Feedback control stops in order to maintain stabilized fuel combustion.

- Deceleration and acceleration
- High-load, high-speed operation
- Malfunction of A/F sensor 1 or its circuit
- Insufficient activation of A/F sensor 1 at low engine coolant temperature
- High engine coolant temperature
- During warm-up
- After shifting from N to D
- When starting the engine

MIXTURE RATIO SELF-LEARNING CONTROL

The mixture ratio feedback control system monitors the mixture ratio signal transmitted from A/F sensor 1. This feedback signal is then sent to the ECM. The ECM controls the basic mixture ratio as close to the theoretical mixture ratio as possible. However, the basic mixture ratio is not necessarily controlled as originally designed. Both manufacturing differences (i.e., mass air flow sensor hot wire) and characteristic changes during operation (i.e., fuel injector clogging) directly affect mixture ratio.

MULTIPORT FUEL INJECTION SYSTEM

< SYSTEM DESCRIPTION >

[VQ35HR]

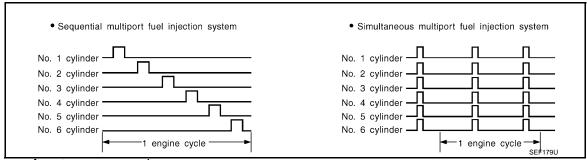
Accordingly, the difference between the basic and theoretical mixture ratios is monitored in this system. This is then computed in terms of "injection pulse duration" to automatically compensate for the difference between the two ratios.

"Fuel trim" refers to the feedback compensation value compared against the basic injection duration. Fuel trim includes short-term fuel trim and long-term fuel trim.

"Short term fuel trim" is the short-term fuel compensation used to maintain the mixture ratio at its theoretical value. The signal from A/F sensor 1 indicates whether the mixture ratio is RICH or LEAN compared to the theoretical value. The signal then triggers a reduction in fuel volume if the mixture ratio is rich, and an increase in fuel volume if it is lean.

"Long-term fuel trim" is overall fuel compensation carried out over time to compensate for continual deviation of the short-term fuel trim from the central value. Continual deviation will occur due to individual engine differences, wear over time and changes in the usage environment.

FUEL INJECTION TIMING



Two types of systems are used.

- Sequential Multiport Fuel Injection System
 Fuel is injected into each cylinder during each engine cycle according to the firing order. This system is used when the engine is running.
- Simultaneous Multiport Fuel Injection System
 Fuel is injected simultaneously into all six cylinders twice each engine cycle. In other words, pulse signals of
 the same width are simultaneously transmitted from the ECM.

The six injectors will then receive the signals 2 times for each engine cycle.

This system is used when the engine is being started and/or if the fail-safe system (CPU) is operating.

FUEL SHUT-OFF

Fuel to each cylinder is cut off during deceleration, operation of the engine at excessively high speeds or operation of the vehicle at excessively high speeds.

EC

D

Е

F

G

J

L

K

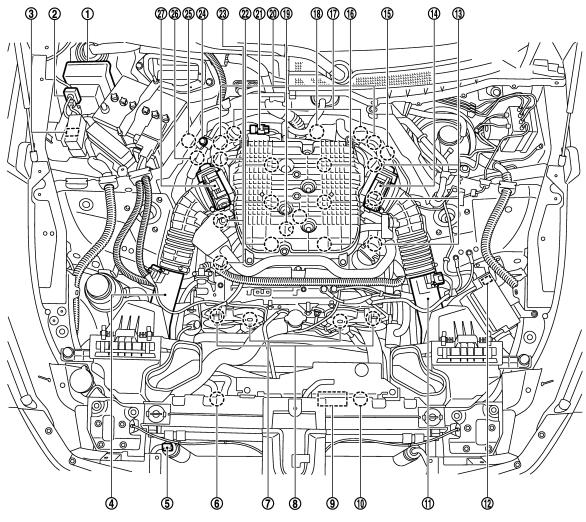
M

Ν

0

Component Parts Location

INFOID:0000000003856003

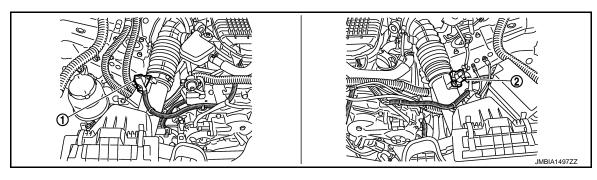


JMBIA149677

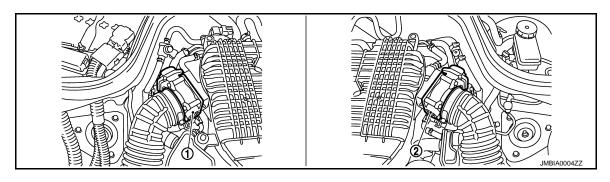
- IPDM E/R 1.
- Mass air flow sensor (with intake air 5. temperature sensor) (bank 1)
- Intake valve timing control solenoid
- 10. Cooling fan motor-1
- 13. Ignition coil (with power transistor) and spark plug (bank 2)
- 16. Fuel injector (bank 2)
- 19. Knock sensor
- 22. Fuel injector (bank 1)
- 25. A/F sensor 1 (bank 1)

- 2. Battery current sensor
- Refrigerant pressure sensor
- 8. Exhaust valve timing control magnet 9. retarder
- 11. Mass air flow sensor (with intake air 12. ICC brake hold relay (ICC models) temperature sensor) (bank 2)
- 14. Electric throttle control actuator (bank 2)
- 17. Camshaft position sensor
- 23. Ignition coil (with power transistor) and spark plug (bank 1)
- 26. Crankshaft position sensor

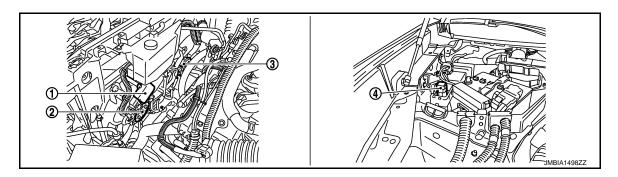
- Cooling fan relay 3.
- Cooling fan motor-2
- Cooling fan control module
- 15. A/F sensor 1 (bank 2)
- 18. Engine coolant temperature sensor
- 20. Exhaust valve timing control position 21. EVAP canister purge volume control solenoid valve
 - 24. EVAP service port
 - 27. Electric throttle control actuator (bank 1)



- . Mass air flow sensor (with intake air 2. temperature sensor) (bank 1)
- Mass air flow sensor (with intake air temperature sensor) (bank 2)



- Electric throttle control actuator (bank 1)
- 2. Electric throttle control actuator (bank 2)



- 1. Cooling fan control module
- 4. Cooling fan relay
- 2. Cooling fan motor-1
- 3. Cooling fan motor-2

EC

Α

D

Е

F

G

Н

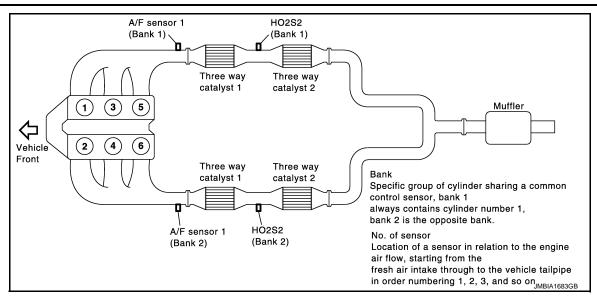
1

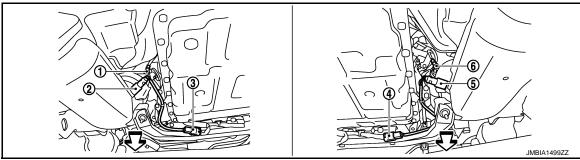
L

M

Ν

0

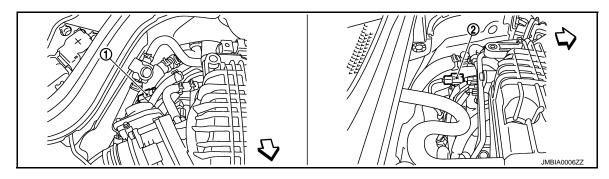




- 1. A/F sensor 1 (bank 2)
- . Heated oxygen sensor 2 (bank 2)
- 3. Heated oxygen sensor 2 (bank 2) harness connector

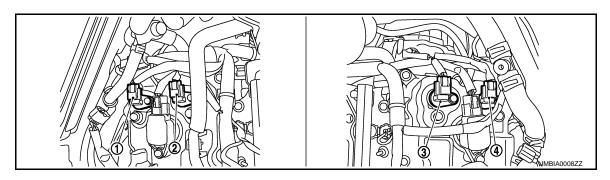
- 4. Heated oxygen sensor 2 (bank 1) harness connector
- 5. Heated oxygen sensor 2 (bank 1)
- 6. A/F sensor 1 (bank 1)

⟨□: Vehicle front



- 1. A/F sensor 1 (bank 1) harness con- 2. nector
- A/F sensor 1 (bank 2) harness connector

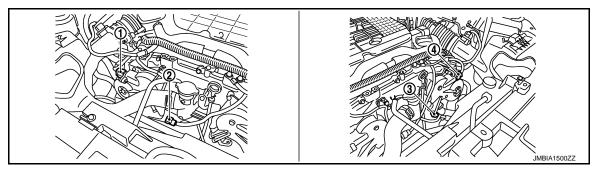
∀
 □: Vehicle front



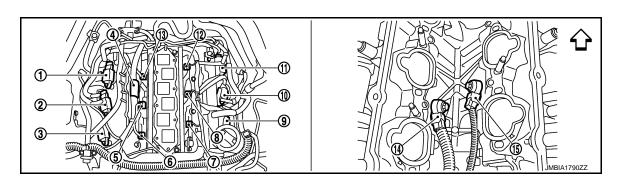
- Exhaust valve timing control position 2. sensor (bank 1)
 - Camshaft position sensor (bank 1)
- 3. Camshaft position sensor (bank 2)

4. Exhaust valve timing control position

sensor (bank 2)



- Exhaust valve timing control magnet 2. retarder (bank 1) harness connector
- Exhaust valve timing control magnet retarder (bank 2) harness connector
- Intake valve timing control solenoid valve (bank 1) harness connector
- Intake valve timing control solenoid valve (bank 2) harness connector



- Ignition coil No.5 (with power transis- 2. 1.
- Condenser 4.
- 7. Fuel injector No.2
- 10. Ignition coil No.4 (with power transis- 11. Ignition coil No.6 (with power transis- 12. Fuel injector No.6 tor)
- 13. Fuel injector No.5

- Ignition coil No.3 (with power transis- 3.
- 5. Fuel injector No.3
- 8. Fuel injector No.4
- 14. Knock sensor (bank 2)

- Ignition coil No.1 (with power transis-
- Fuel injector No.1 6.

3.

- Ignition coil No.2 (with power transistor)
- 15. Knock sensor (bank 1)

Α

EC

D

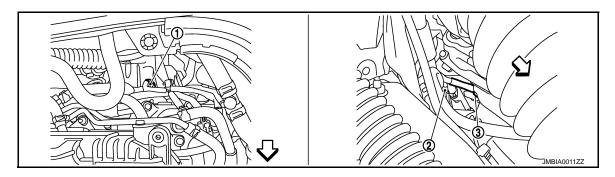
Е

F

Н

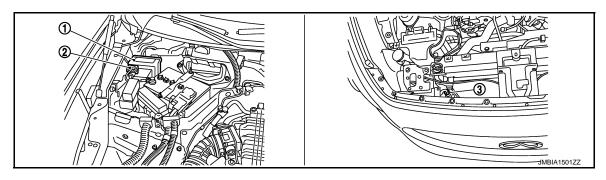
M

Ν



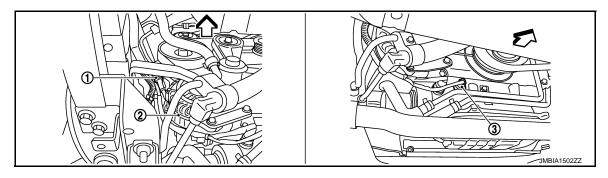
- Engine coolant temperature sensor 2. A/F sensor 1 (bank 1)
- Crankshaft position sensor

∀
 : Vehicle front



IPDM E/R

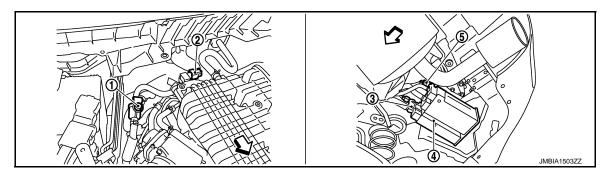
- Battery current sensor
- Refrigerant pressure sensor



- Power steering pressure sensor
- 2. Alternator

Engine oil temperature sensor

∀
 □: Vehicle front

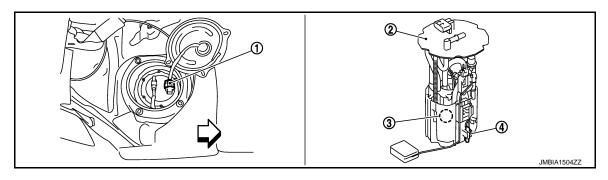


- 1. EVAP service port
- EVAP canister purge volume control 3. EVAP canister vent control valve solenoid valve

[VQ35HR]

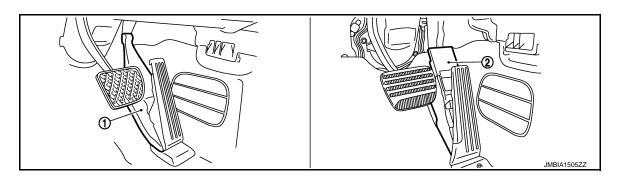
4. EVAP canister

EVAP control system pressure sensor

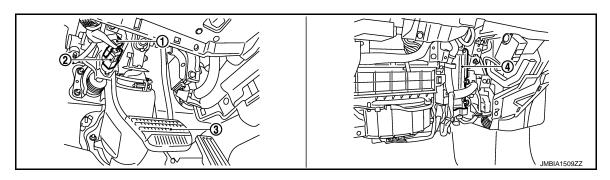


- Fuel level sensor unit and fuel pump 2. Fuel level sensor unit and fuel pump 3. Fuel pressure regulator harness connector
- 4. Fuel tank temperature sensor

∀ : Vehicle front



 Accelerator pedal position sensor (Without DCA system) 2. Accelerator pedal position sensor (With DCA system)



- 1. Stop lamp switch
- ASCD brake switch (ASCD models)
 Brake pedal ICC brake switch (ICC models)

4. ECM

EC

Α

D

Е

F

G

Н

.

J

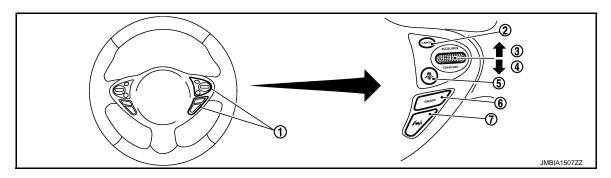
Κ

L

M

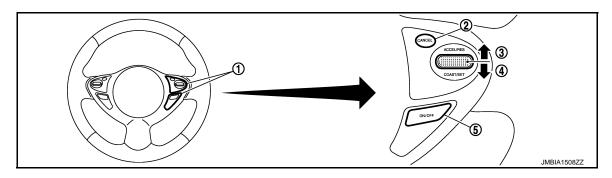
Ν

0



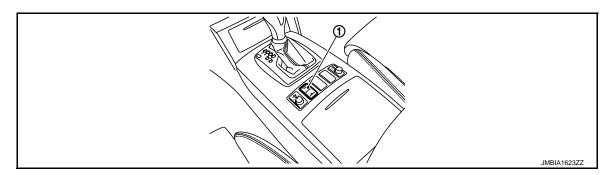
- 1. ICC steering switch
- 4. SET/COAST switch
- 7. LDP switch

- 2. CANCEL switch
- 5. DISTANCE switch
- 3. RESUME/ACCELERATE switch
- 6. MAIN switch



- ASCD steering switch
 SET/COAST switch
- 2. CANCEL switch
- MAIN switch

RESUME/ACCELERATE switch



1. Snow mode switch

Component Description

INFOID:0000000003856004

Component	Reference
A/F sensor 1	EC-202, "Description"
Accelerator pedal position sensor	EC-444, "Description"
Camshaft position sensor	EC-275, "Description"
Crankshaft position sensor	EC-270, "Description"
Engine coolant temperature sensor	EC-188, "Description"
Fuel injector	EC-472, "Description"
Heated oxygen sensor 2	EC-217, "Description"
Intake air temperature sensor	EC-183, "Description"

MULTIPORT FUEL INJECTION SYSTEM

< SYSTEM DESCRIPTION >

[VQ35HR]

Component	Reference
Knock sensor	EC-267, "Description"
Mass air flow sensor	EC-170, "Description"
Power steering pressure sensor	EC-353, "Description"
Throttle position sensor	EC-191, "Description"

Α

EC

C

D

Е

F

G

Н

1

Κ

L

M

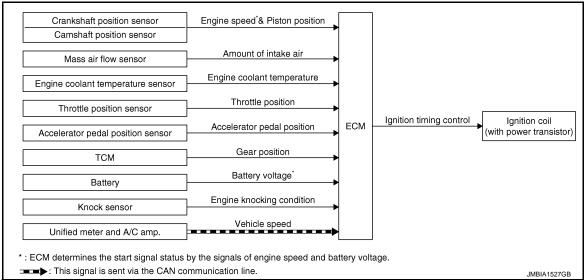
Ν

0

ELECTRIC IGNITION SYSTEM

System Diagram

INFOID:0000000003856005



System Description

INFOID:0000000003856006

INPUT/OUTPUT SIGNAL CHART

Sensor	Input Signal to ECM	ECM function	Actuator
Crankshaft position sensor	- · · · · · · · · · · · · · · · · · · ·		
Camshaft position sensor	Engine speed* ² & Piston position		Ignition coil (with power transistor)
Mass air flow sensor	Amount of intake air		
Engine coolant temperature sensor	Engine coolant temperature		
Throttle position sensor	Throttle position	_	
Accelerator pedal position sensor	Accelerator pedal position		
ТСМ	Gear position		
Battery	Battery voltage*2		
Knock sensor	Engine knocking		
Unifed meter and A/C amp.	Vehicle speed*1		

^{*1:} This signal is sent to the ECM via the CAN communication line.

SYSTEM DESCRIPTION

Ignition order: 1 - 2 - 3 - 4 - 5 - 6

The ignition timing is controlled by the ECM to maintain the best air-fuel ratio for every running condition of the engine. The ignition timing data is stored in the ECM.

The ECM receives information such as the injection pulse width and camshaft position sensor signal. Computing this information, ignition signals are transmitted to the power transistor.

During the following conditions, the ignition timing is revised by the ECM according to the other data stored in the ECM.

- At starting
- During warm-up
- At idle
- At low battery voltage
- During acceleration

The knock sensor retard system is designed only for emergencies. The basic ignition timing is programmed within the anti-knocking zone, if recommended fuel is used under dry conditions. The retard system does not

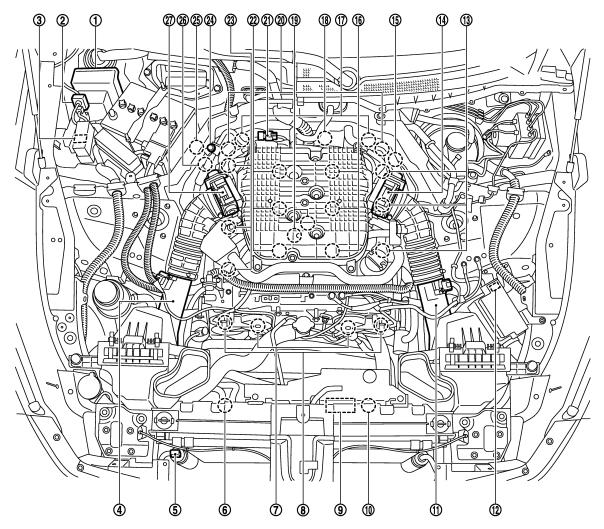
^{*2:} ECM determines the start signal status by the signals of engine speed and battery voltage.

[VQ35HR]

operate under normal driving conditions. If engine knocking occurs, the knock sensor monitors the condition. The signal is transmitted to the ECM. The ECM retards the ignition timing to eliminate the knocking condition.

Component Parts Location

INFOID:0000000003856007



JMBIA1496ZZ

1. IPD	M E/R
--------	-------

- Mass air flow sensor (with intake air 5. temperature sensor) (bank 1)
- 7. Intake valve timing control solenoid valve
- 10. Cooling fan motor-1
- 13. Ignition coil (with power transistor) and spark plug (bank 2)
- 16. Fuel injector (bank 2)
- Knock sensor 19.
- 22. Fuel injector (bank 1)
- 25. A/F sensor 1 (bank 1)

- 2. Battery current sensor
- Refrigerant pressure sensor
- 8. Exhaust valve timing control magnet 9. retarder
- Mass air flow sensor (with intake air temperature sensor) (bank 2)
- 14. Electric throttle control actuator (bank 2)
- 17. Camshaft position sensor
- 20. Exhaust valve timing control position
- 23. Ignition coil (with power transistor) and spark plug (bank 1)
- 26. Crankshaft position sensor

- 3. Cooling fan relay
- 6. Cooling fan motor-2
- Cooling fan control module
- ICC brake hold relay (ICC models)
- 15. A/F sensor 1 (bank 2)
- 18. Engine coolant temperature sensor
- 21. EVAP canister purge volume control solenoid valve
- 24. EVAP service port
- (bank 1)

EC

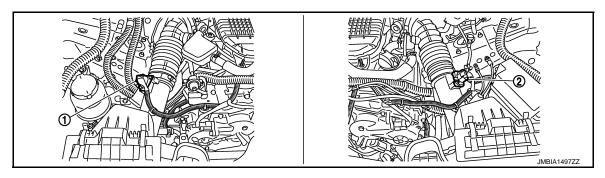
D

Н

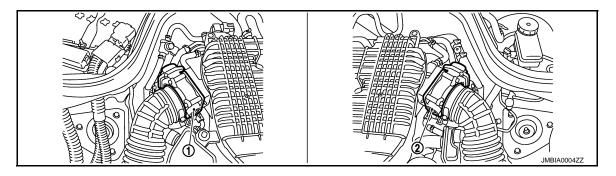
Ν

Ρ

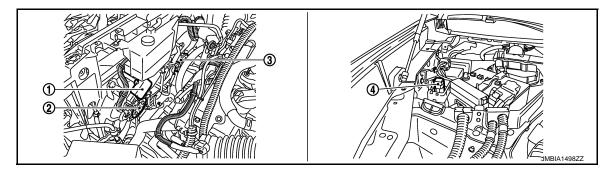
27. Electric throttle control actuator



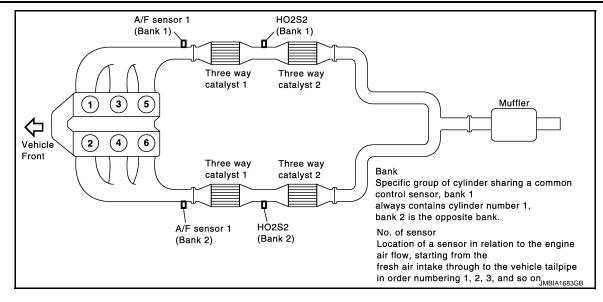
- Mass air flow sensor (with intake air 2. temperature sensor) (bank 1)
- Mass air flow sensor (with intake air temperature sensor) (bank 2)

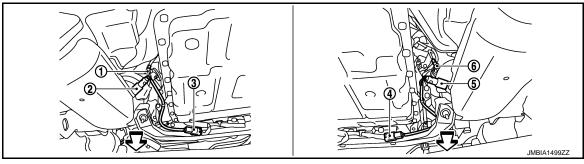


- Electric throttle control actuator (bank 1)
- 2. Electric throttle control actuator (bank 2)



- 1. Cooling fan control module
- 4. Cooling fan relay
- 2. Cooling fan motor-1
- 3. Cooling fan motor-2

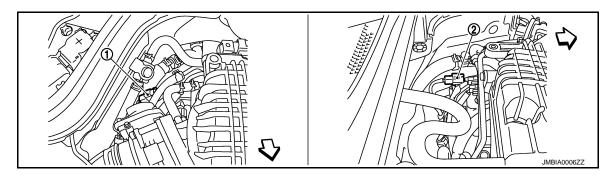




- 1. A/F sensor 1 (bank 2)
- 2. Heated oxygen sensor 2 (bank 2)
- 3. Heated oxygen sensor 2 (bank 2) harness connector

- 4. Heated oxygen sensor 2 (bank 1) harness connector
- 5. Heated oxygen sensor 2 (bank 1)
- 6. A/F sensor 1 (bank 1)

∀
 : Vehicle front



- A/F sensor 1 (bank 1) harness con- 2. nector
 - A/F sensor 1 (bank 2) harness connector

∀ : Vehicle front

Α

EC

D

Е

F

G

Н

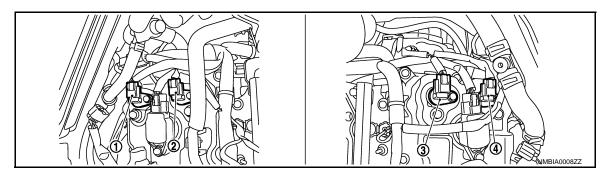
K

L

M

Ν

0

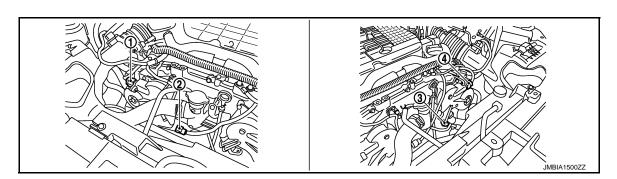


Exhaust valve timing control position 2. sensor (bank 1)

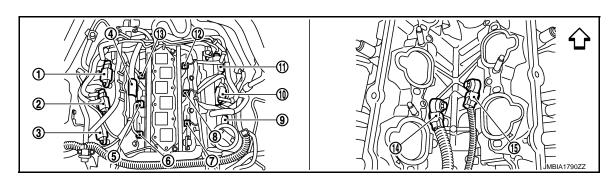
sensor (bank 2)

4.

- Exhaust valve timing control position
- Camshaft position sensor (bank 1)
- 3. Camshaft position sensor (bank 2)



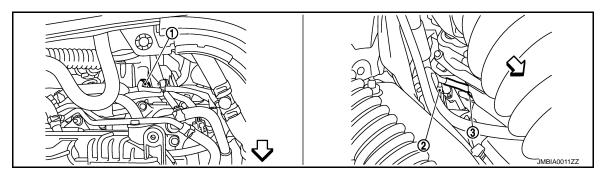
- Exhaust valve timing control magnet 2. retarder (bank 1) harness connector
- 4. Exhaust valve timing control magnet retarder (bank 2) harness connector
- Intake valve timing control solenoid valve (bank 1) harness connector
- Intake valve timing control solenoid valve (bank 2) harness connector



- Ignition coil No.5 (with power transis- 2. 1.
- Condenser 4.
- 7. Fuel injector No.2
- 10. Ignition coil No.4 (with power transis- 11. Ignition coil No.6 (with power transis- 12. Fuel injector No.6 tor)
- 13. Fuel injector No.5

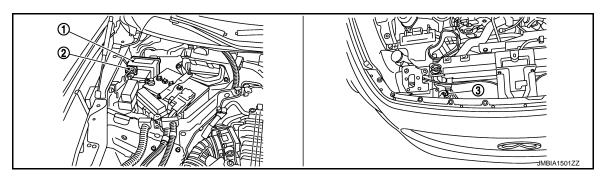
- Ignition coil No.3 (with power transis- 3.
- 5. Fuel injector No.3
- 8. Fuel injector No.4
- tor)
- 14. Knock sensor (bank 2)

- Ignition coil No.1 (with power transis-
- Fuel injector No.1
- Ignition coil No.2 (with power transistor)
- 15. Knock sensor (bank 1)



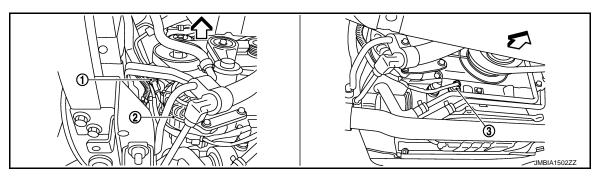
- Engine coolant temperature sensor 2.
- A/F sensor 1 (bank 1)
- 3. Crankshaft position sensor

⟨□: Vehicle front



1. IPDM E/R

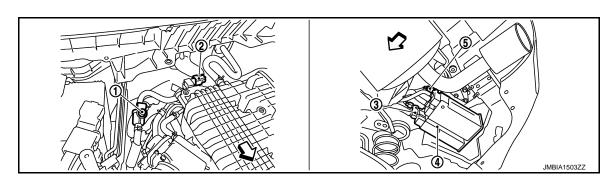
- Battery current sensor
- Refrigerant pressure sensor



- Power steering pressure sensor
- 2. Alternator

Engine oil temperature sensor

∀
 □: Vehicle front



- EVAP service port
- 2. EVAP canister purge volume control 3. EVAP canister vent control valve solenoid valve

EC-55 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

F

G

Н

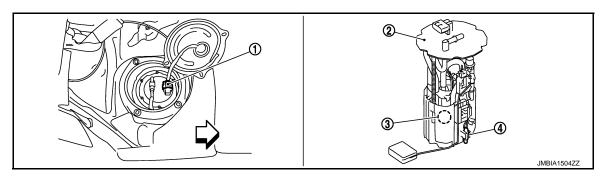
Ν

0

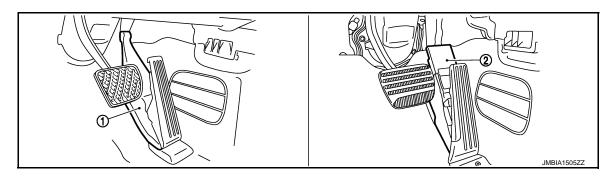
4. EVAP canister

EVAP control system pressure sensor

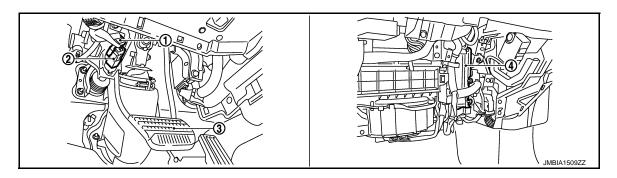
⟨¬: Vehicle front



- Fuel level sensor unit and fuel pump 2. Fuel level sensor unit and fuel pump 3. Fuel pressure regulator harness connector
- 4. Fuel tank temperature sensor
- ∀
 □: Vehicle front



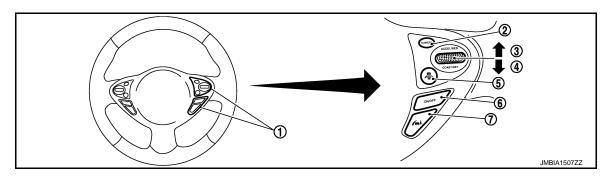
- Accelerator pedal position sensor (Without DCA system)
- Accelerator pedal position sensor (With DCA system)



1. Stop lamp switch

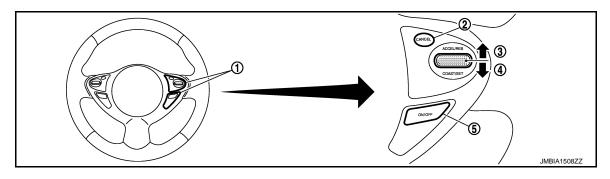
 ASCD brake switch (ASCD models) 3. Brake pedal ICC brake switch (ICC models)

4. ECM



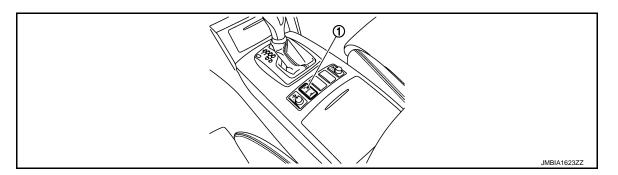
- ICC steering switch
- 4. SET/COAST switch
- 7. LDP switch

- 2. CANCEL switch
- 5. DISTANCE switch
- 3. RESUME/ACCELERATE switch
- 6. MAIN switch



- 1. ASCD steering switch
- 4. SET/COAST switch
- 2. CANCEL switch
- 5. MAIN switch

3. RESUME/ACCELERATE switch



1. Snow mode switch

Component Description

INFOID:0000000003856008

Component	Reference	
Accelerator pedal position sensor	EC-444, "Description"	
Camshaft position sensor	EC-275, "Description"	
Crankshaft position sensor	EC-270, "Description"	
Engine coolant temperature sensor	EC-188, "Description"	
Knock sensor	EC-267, "Description"	
Mass air flow sensor	EC-170, "Description"	
Throttle position sensor	EC-191, "Description"	

Revision: 2009 March EC-57 2009 FX35/FX50

EC

Α

D

Е

F

G

Н

1

J

Κ

L

N /

Ν

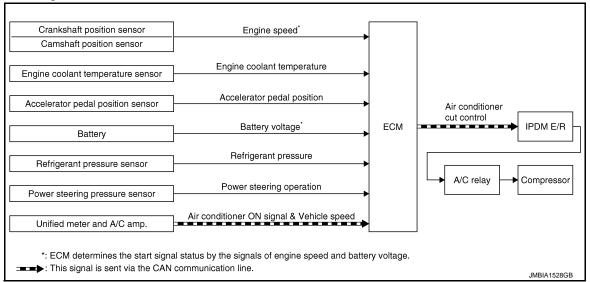
0

[VQ35HR]

AIR CONDITIONING CUT CONTROL

System Diagram

INFOID:0000000003856009



System Description

INFOID:0000000003856010

INPUT/OUTPUT SIGNAL CHART

Sensor	Input Signal to ECM	ECM function	Actuator	
Crankshaft position sensor	2			
Camshaft position sensor	Engine speed* ²			
Engine coolant temperature sensor	Engine coolant temperature	Air conditioner	IPDM E/R ↓ A/C relay ↓ Compressor	
Accelerator pedal position sensor	Accelerator pedal position			
Battery	Battery voltage*2	cut control		
Refrigerant pressure sensor	Refrigerant pressure			
Power steering pressure sensor	Power steering operation			
Unified meter and A/C amp.	Vehicle speed & Air conditioner ON signal*1			

^{*1:} This signal is sent to the ECM via the CAN communication line.

SYSTEM DESCRIPTION

This system improves engine operation when the air conditioner is used.

Under the following conditions, the air conditioner is turned off.

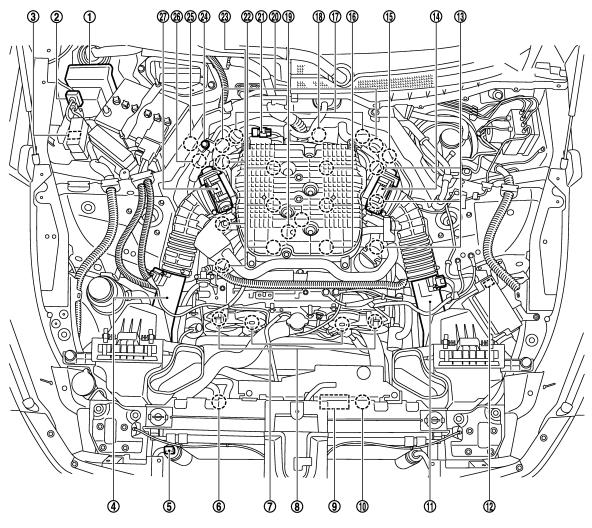
- When the accelerator pedal is fully depressed.
- · When cranking the engine.
- At high engine speeds.
- When the engine coolant temperature becomes excessively high.
- When operating power steering during low engine speed or low vehicle speed.
- When engine speed is excessively low.
- When refrigerant pressure is excessively low or high.

^{*2:} ECM determines the start signal status by the signals of engine speed and battery voltage.

[VQ35HR]

Component Parts Location

INFOID:0000000003856011



JMBIA1496ZZ

- 1. IPDM E/R
- Mass air flow sensor (with intake air 5. temperature sensor) (bank 1)
- Intake valve timing control solenoid valve
- 10. Cooling fan motor-1
- 13. Ignition coil (with power transistor) and spark plug (bank 2)
- 16. Fuel injector (bank 2)
- 19. Knock sensor
- 22. Fuel injector (bank 1)
- 25. A/F sensor 1 (bank 1)

- 2. Battery current sensor
- 5. Refrigerant pressure sensor
- 8. Exhaust valve timing control magnet 9. retarder
- Mass air flow sensor (with intake air 12. temperature sensor) (bank 2)
- 14. Electric throttle control actuator (bank 2)
- 17. Camshaft position sensor
- 20. Exhaust valve timing control position sensor
- 23. Ignition coil (with power transistor) and spark plug (bank 1)
- 26. Crankshaft position sensor

- Cooling fan relay
- Cooling fan motor-2
- 9. Cooling fan control module
- 12. ICC brake hold relay (ICC models)
- 15. A/F sensor 1 (bank 2)
- 18. Engine coolant temperature sensor
- 21. EVAP canister purge volume control solenoid valve
- 24. EVAP service port
- 27. Electric throttle control actuator (bank 1)

EC

Α

D

Е

F

G

Н

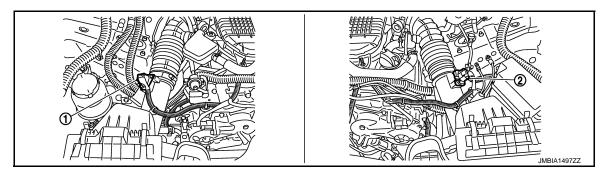
|

K

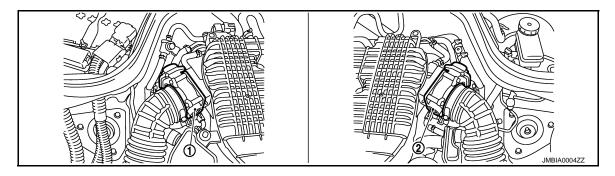
M

N

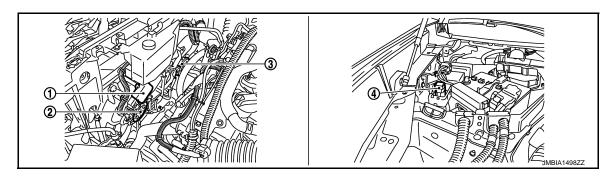
0



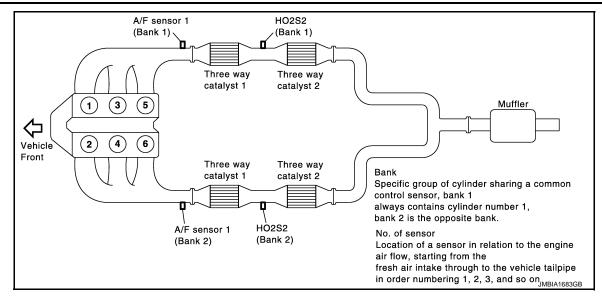
- . Mass air flow sensor (with intake air 2. temperature sensor) (bank 1)
- Mass air flow sensor (with intake air temperature sensor) (bank 2)

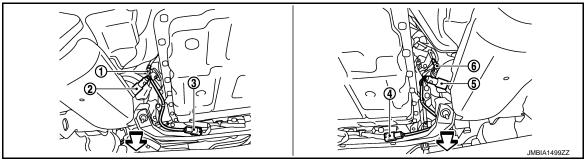


- Electric throttle control actuator (bank 1)
- 2. Electric throttle control actuator (bank 2)



- 1. Cooling fan control module
- 4. Cooling fan relay
- 2. Cooling fan motor-1
- 3. Cooling fan motor-2

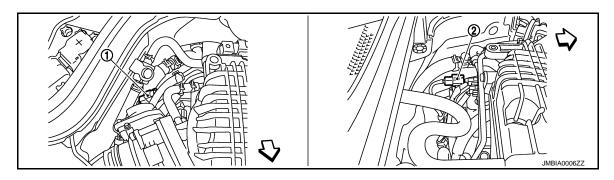




- 1. A/F sensor 1 (bank 2)
- 2. Heated oxygen sensor 2 (bank 2)
- Heated oxygen sensor 2 (bank 2) harness connector

- 4. Heated oxygen sensor 2 (bank 1) harness connector
- 5. Heated oxygen sensor 2 (bank 1)
- 6. A/F sensor 1 (bank 1)

∀
 : Vehicle front



- A/F sensor 1 (bank 1) harness con- 2. nector
 - A/F sensor 1 (bank 2) harness connector

∀
 : Vehicle front

Α

EC

0

D

Е

F

G

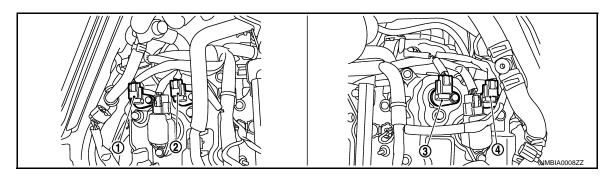
Н

Κ

M

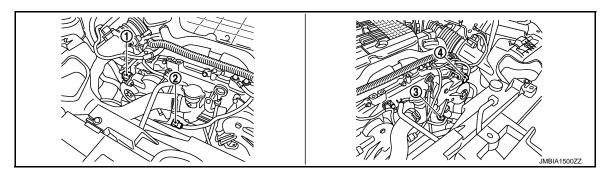
Ν

 \bigcirc



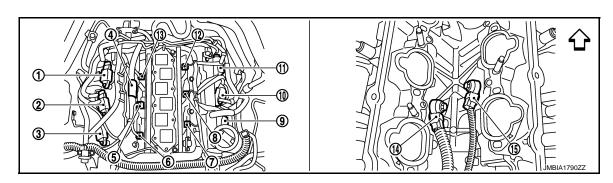
- Exhaust valve timing control position 2. sensor (bank 1)
- Camshaft position sensor (bank 1)
- 3. Camshaft position sensor (bank 2)

4. Exhaust valve timing control position sensor (bank 2)



- Exhaust valve timing control magnet 2. retarder (bank 1) harness connector
- 4. Exhaust valve timing control magnet retarder (bank 2) harness connector
- Intake valve timing control solenoid valve (bank 1) harness connector
- Intake valve timing control solenoid valve (bank 2) harness connector

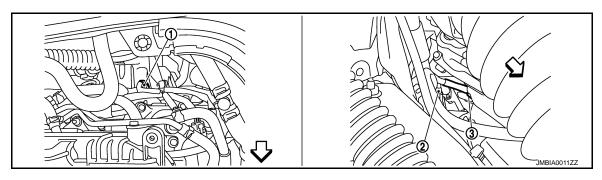
3.



- Ignition coil No.5 (with power transis- 2. 1.
- Condenser 4.
- 7. Fuel injector No.2
- 10. Ignition coil No.4 (with power transis- 11. Ignition coil No.6 (with power transis- 12. Fuel injector No.6 tor)
- 13. Fuel injector No.5

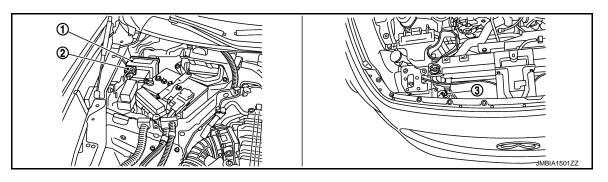
- Ignition coil No.3 (with power transis- 3.
- 5. Fuel injector No.3
- 8. Fuel injector No.4
- tor)
- 14. Knock sensor (bank 2)

- Ignition coil No.1 (with power transis-
- Fuel injector No.1
- Ignition coil No.2 (with power transistor)
- 15. Knock sensor (bank 1)



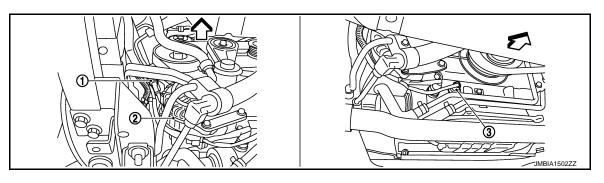
- Engine coolant temperature sensor 2.
 - A/F sensor 1 (bank 1)
- 3. Crankshaft position sensor

⟨□: Vehicle front



1. IPDM E/R

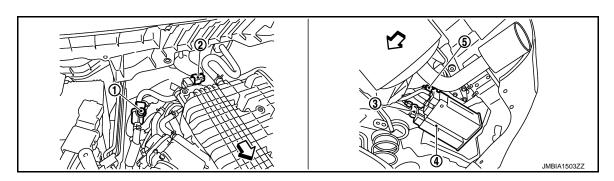
- Battery current sensor
- Refrigerant pressure sensor



- Power steering pressure sensor
- 2. Alternator

Engine oil temperature sensor

∀
 □: Vehicle front



- EVAP service port
- 2. EVAP canister purge volume control 3. EVAP canister vent control valve solenoid valve

EC-63 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

F

Н

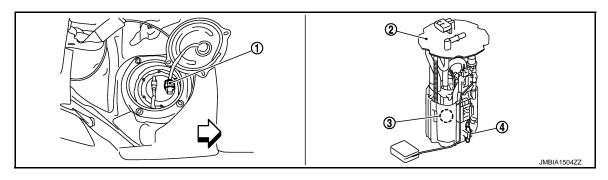
Ν

0

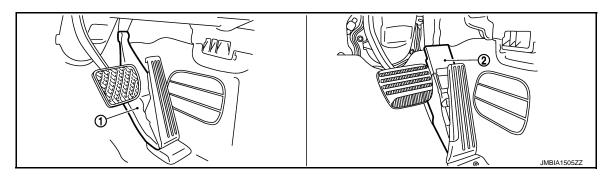
4. EVAP canister

EVAP control system pressure sensor

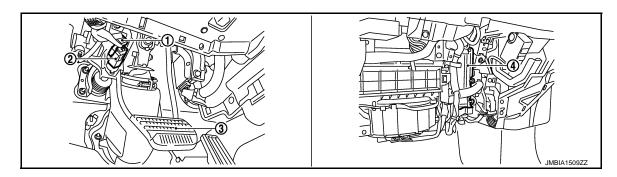
⟨¬: Vehicle front



- Fuel level sensor unit and fuel pump 2. Fuel level sensor unit and fuel pump 3. Fuel pressure regulator harness connector
- 4. Fuel tank temperature sensor
- ∀
 □: Vehicle front



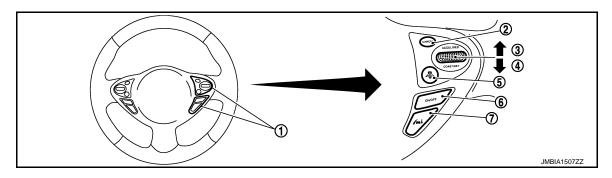
- Accelerator pedal position sensor (Without DCA system)
- Accelerator pedal position sensor (With DCA system)



1. Stop lamp switch

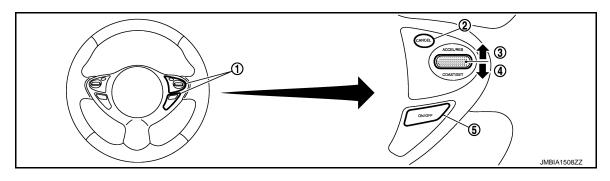
ASCD brake switch (ASCD models)
 Brake pedal ICC brake switch (ICC models)

4. ECM



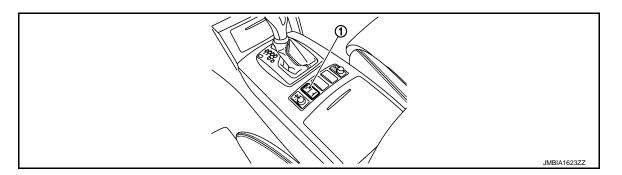
- ICC steering switch
- 4. SET/COAST switch
- 7. LDP switch

- 2. CANCEL switch
- 5. DISTANCE switch
- 3. RESUME/ACCELERATE switch
- 6. MAIN switch



- 1. ASCD steering switch
- 4. SET/COAST switch
- 2. CANCEL switch
- 5. MAIN switch

3. RESUME/ACCELERATE switch



1. Snow mode switch

Component Description

INFOID:0000000003856012

Component	Reference
Accelerator pedal position sensor	EC-444, "Description"
Camshaft position sensor	EC-275, "Description"
Crankshaft position sensor	EC-270, "Description"
Engine coolant temperature sensor	EC-188, "Description"
Power steering pressure sensor	EC-353, "Description"
Refrigerant pressure sensor	EC-496, "Description"

Revision: 2009 March **EC-65** 2009 FX35/FX50

EC

Α

D

Е

F

G

Н

1

J

Κ

L

N /I

Ν

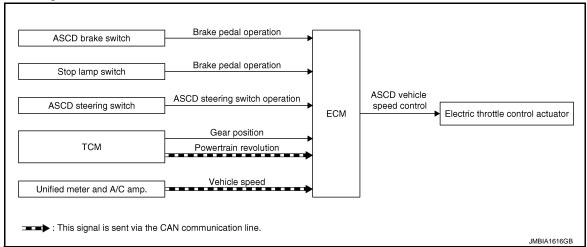
0

[VQ35HR]

AUTOMATIC SPEED CONTROL DEVICE (ASCD)

System Diagram

INFOID:0000000003856013



System Description

INFOID:0000000003856014

INPUT/OUTPUT SIGNAL CHART

Sensor	Input signal to ECM	ECM function	Actuator
ASCD brake switch	Brake pedal operation		
Stop lamp switch	Brake pedal operation		Electric throttle control actuator
ASCD steering switch	ASCD steering switch operation	ASCD vehicle speed control	
TCM	Gear position	actuator	
TOW	Powertrain revolution*		
Unified meter and A/C amp.	Vehicle speed*		

^{*:} This signal is sent to the ECM via the CAN communication line

BASIC ASCD SYSTEM

Refer to Owner's Manual for ASCD operating instructions.

Automatic Speed Control Device (ASCD) allows a driver to keep vehicle at predetermined constant speed without depressing accelerator pedal. Driver can set vehicle speed in advance between approximately 40 km/h (25 MPH) and 144 km/h (89 MPH).

ECM controls throttle angle of electric throttle control actuator to regulate engine speed.

The ASCD operation status is indicated by two indicators (CRUISE and SET on the information display) on the combination meter. If any malfunction occurs in the ASCD system, SET indicator blinks and ASCD control is deactivated.

NOTE:

Always drive vehicle in a safe manner according to traffic conditions and obey all traffic laws.

SET OPERATION

Press MAIN switch. (CRUISE is indicator on the information display.)

When vehicle speed reaches a desired speed between approximately 40 km/h (25 MPH) and 144 km/h (89 MPH), press SET/COAST switch. (Then SET is indicated on the information display, and the set speed is also display.)

ACCELERATE OPERATION

If the RESUME/ACCELERATE switch is pressed during cruise control driving, increase the vehicle speed until the switch is released or vehicle speed reaches maximum speed controlled by the system. And then ASCD will maintain the new set speed.

CANCEL OPERATION

When any of following conditions exist, cruise operation will be canceled.

CANCEL switch is pressed

AUTOMATIC SPEED CONTROL DEVICE (ASCD)

< SYSTEM DESCRIPTION >

More than 2 switches on ASCD steering switch are pressed at the same time (Set speed will be cleared)

- Brake pedal is depressed
- Selector lever position is changed to N, P or R
- Vehicle speed decreased to 13 km/h (8 MPH) lower than the set speed
- TCS system is operated

When the ECM detects any of the following conditions, the ECM will cancel the cruise operation and inform the driver by blinking indicators.

• Engine coolant temperature is slightly higher than the normal operating temperature, CRUISE lamp may blink slowly.

When the engine coolant temperature decreases to the normal operating temperature, CRUISE lamp will stop blinking and the cruise operation will be able to work by pressing SET/COAST switch or RESUME/ACCELERATE switch.

Malfunction for some self-diagnoses regarding ASCD control: SET indicator will blink quickly.
 If MAIN switch is turned to OFF while ASCD is activated, all of ASCD operations will be canceled and vehicle speed memory will be erased.

COAST OPERATION

When the SET/COAST switch is pressed during cruise control driving, decrease vehicle set speed until the switch is released. And then ASCD will maintain the new set speed.

RESUME OPERATION

When the RESUME/ACCELERATE switch is pressed after canceling operation other than pressing the MAIN switch, vehicle speed will return to last set speed. To resume vehicle set speed, vehicle condition must meet following conditions.

- Brake pedal is released
- A/T selector lever is in a position other than P and N
- Vehicle speed is greater than 40 km/h (25 MPH) and less than 144 km/h (89 MPH)

EC

Α

[VQ35HR]

D

Е

F

G

Н

-

J

K

L

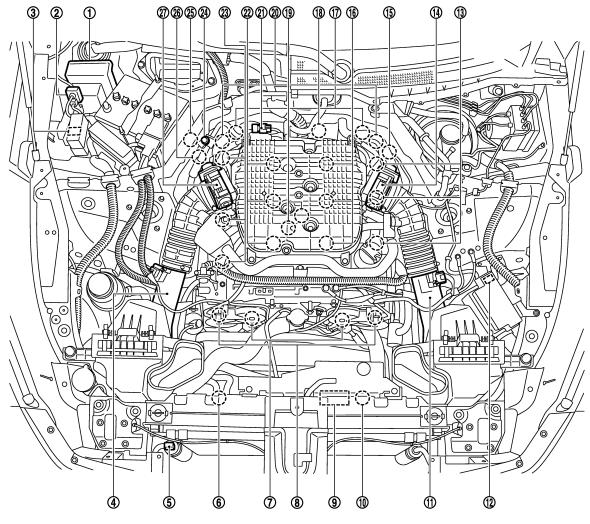
M

Ν

0

Component Parts Location

INFOID:0000000003856015

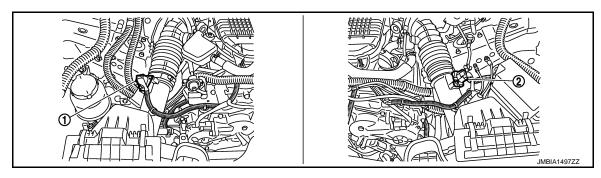


JMBIA149677

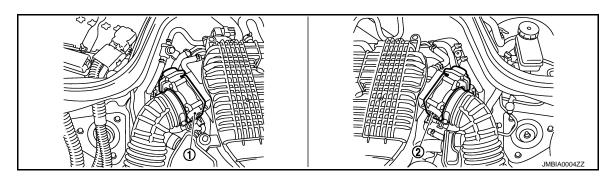
- IPDM E/R
- Mass air flow sensor (with intake air 5. temperature sensor) (bank 1)
- Intake valve timing control solenoid
- 10. Cooling fan motor-1
- 13. Ignition coil (with power transistor) and spark plug (bank 2)
- 16. Fuel injector (bank 2)
- Knock sensor
- 22. Fuel injector (bank 1)
- 25. A/F sensor 1 (bank 1)

- 2. Battery current sensor
- Refrigerant pressure sensor
- 8. Exhaust valve timing control magnet 9. retarder
- 11. Mass air flow sensor (with intake air 12. ICC brake hold relay (ICC models) temperature sensor) (bank 2)
- 14. Electric throttle control actuator (bank 2)
- 17. Camshaft position sensor
- 23. Ignition coil (with power transistor) and spark plug (bank 1)
- 26. Crankshaft position sensor

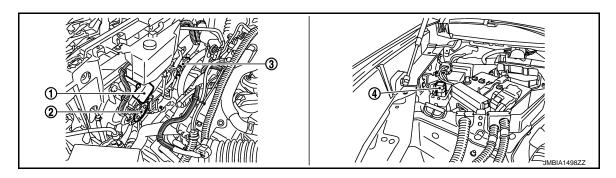
- Cooling fan relay
- Cooling fan motor-2
- Cooling fan control module
- 15. A/F sensor 1 (bank 2)
- 18. Engine coolant temperature sensor
- 20. Exhaust valve timing control position 21. EVAP canister purge volume control solenoid valve
 - 24. EVAP service port
 - 27. Electric throttle control actuator (bank 1)



- . Mass air flow sensor (with intake air 2. temperature sensor) (bank 1)
- . Mass air flow sensor (with intake air temperature sensor) (bank 2)



- Electric throttle control actuator (bank 1)
- 2. Electric throttle control actuator (bank 2)



- 1. Cooling fan control module
- 4. Cooling fan relay
- 2. Cooling fan motor-1
- 3. Cooling fan motor-2

EC

Α

D

Е

F

G

Н

J

<

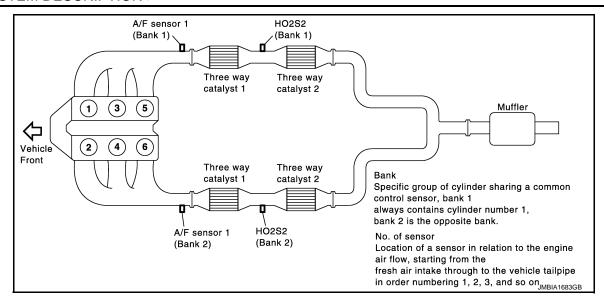
L

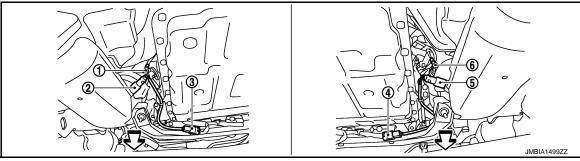
M

Ν

0

Ρ

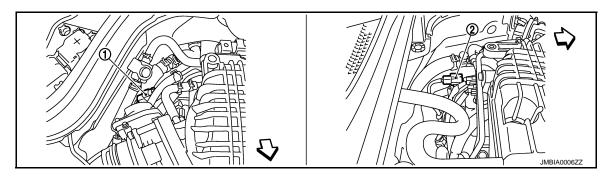




- 1. A/F sensor 1 (bank 2)
- 2. Heated oxygen sensor 2 (bank 2)
- 3. Heated oxygen sensor 2 (bank 2) harness connector

- 4. Heated oxygen sensor 2 (bank 1) harness connector
- 5. Heated oxygen sensor 2 (bank 1)
- 6. A/F sensor 1 (bank 1)

⟨□: Vehicle front

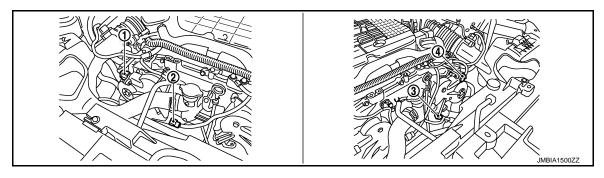


- 1. A/F sensor 1 (bank 1) harness con- 2. nector
- A/F sensor 1 (bank 2) harness connector

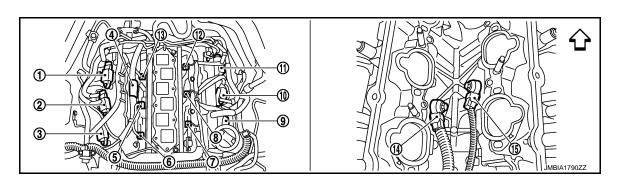
∀
 □: Vehicle front

- Exhaust valve timing control position 2. sensor (bank 1)
 - Camshaft position sensor (bank 1)
- 3. Camshaft position sensor (bank 2)

4. Exhaust valve timing control position sensor (bank 2)



- Exhaust valve timing control magnet 2. retarder (bank 1) harness connector
- Exhaust valve timing control magnet retarder (bank 2) harness connector
- Intake valve timing control solenoid valve (bank 1) harness connector
- Intake valve timing control solenoid valve (bank 2) harness connector



- Ignition coil No.5 (with power transis- 2. 1.
- Condenser 4.
- 7. Fuel injector No.2
- 10. Ignition coil No.4 (with power transis- 11. Ignition coil No.6 (with power transis- 12. Fuel injector No.6
- 13. Fuel injector No.5

- Ignition coil No.3 (with power transis- 3.
- 5. Fuel injector No.3
- 8. Fuel injector No.4
- 14. Knock sensor (bank 2)

- Ignition coil No.1 (with power transis-
- Fuel injector No.1 6.

3.

- Ignition coil No.2 (with power transistor)
- 15. Knock sensor (bank 1)

Α

EC

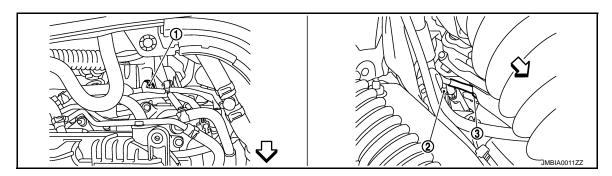
D

Е

Н

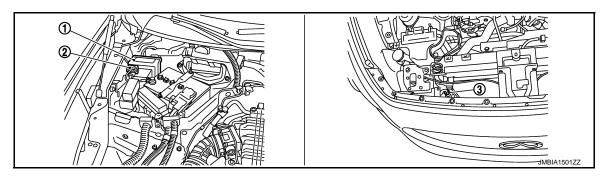
M

Ν



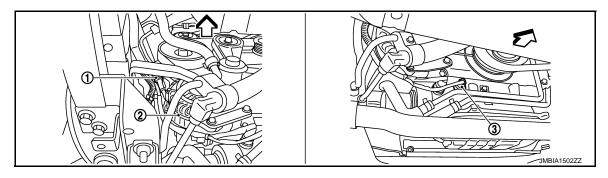
- Engine coolant temperature sensor 2. A/F sensor 1 (bank 1)
- Crankshaft position sensor

∀
 : Vehicle front



IPDM E/R

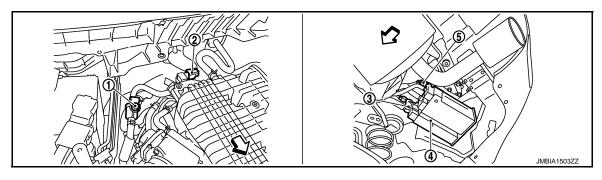
- Battery current sensor
- Refrigerant pressure sensor



- Power steering pressure sensor
- 2. Alternator

Engine oil temperature sensor

∀
 □: Vehicle front



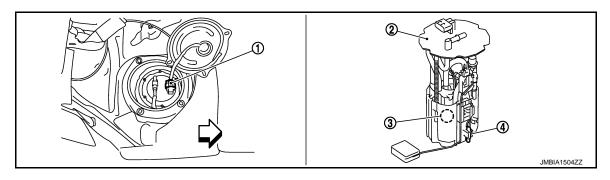
- 1. EVAP service port
- EVAP canister purge volume control 3. EVAP canister vent control valve solenoid valve

AUTOMATIC SPEED CONTROL DEVICE (ASCD)

< SYSTEM DESCRIPTION >

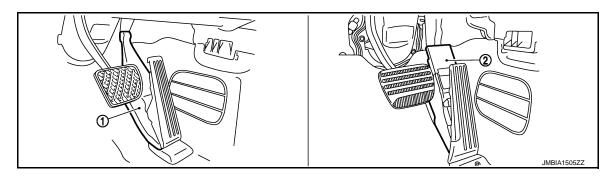
4. EVAP canister

5. EVAP control system pressure sensor

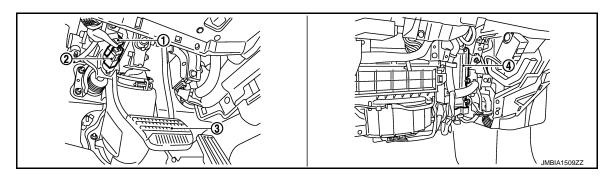


- Fuel level sensor unit and fuel pump 2. Fuel level sensor unit and fuel pump 3. Fuel pressure regulator harness connector
- 4. Fuel tank temperature sensor

∀ : Vehicle front



- Accelerator pedal position sensor (Without DCA system)
- 2. Accelerator pedal position sensor (With DCA system)



- 1. Stop lamp switch
- ASCD brake switch (ASCD models)
 Brake pedal ICC brake switch (ICC models)

4. ECM

EC

Α

[VQ35HR]

0

D

Е

F

G

Н

.

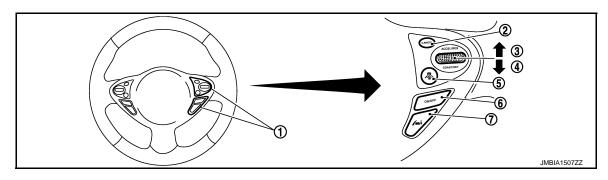
J

K

M

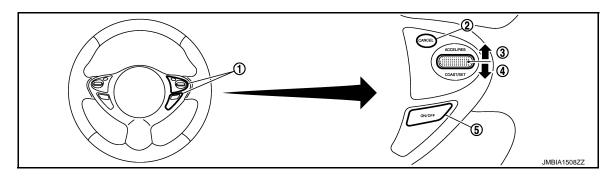
Ν

0



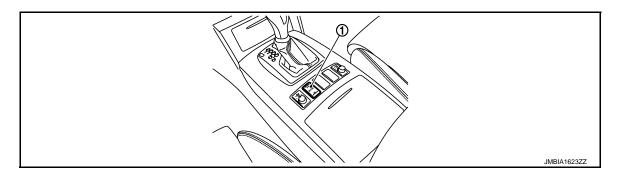
- ICC steering switch
- 4. SET/COAST switch
- 7. LDP switch

- 2. CANCEL switch
- 5. DISTANCE switch
- 3. RESUME/ACCELERATE switch
- 6. MAIN switch



- 1. ASCD steering switch
- 2. CANCEL switch
- SET/COAST switch 5. MAIN switch

3. RESUME/ACCELERATE switch



1. Snow mode switch

Component Description

INFOID:0000000003856016

Component	Reference
ASCD brake switch	EC-424, "Description"
ASCD indicator	EC-465, "Description"
ASCD steering switch	EC-417, "Description"
Electric throttle control actuator	EC-395, "Description"
Stop lamp switch	EC-424, "Description"

CAN COMMUNICATION

< SYSTEM DESCRIPTION >

[VQ35HR]

CAN COMMUNICATION

System Description

INFOID:0000000003856017

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

Refer to LAN-32, "CAN Communication Signal Chart", about CAN communication for detail.

EC

Α

С

D

Е

F

Н

1

K

L

M

Ν

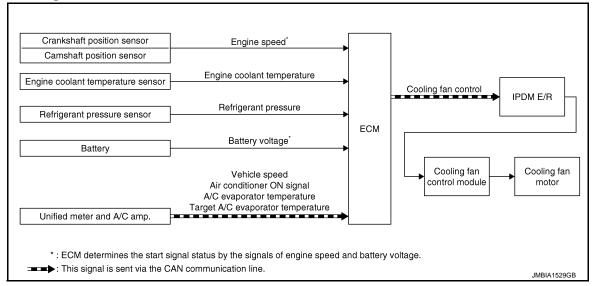
0

[VQ35HR]

COOLING FAN CONTROL

System Diagram

INFOID:0000000003856018



System Description

INFOID:0000000003856019

INPUT/OUTPUT SIGNAL CHART

Sensor	Input signal to ECM	ECM function	Actuator
Crankshaft position sensor	Foreign consider	Cooling fan control	IPDM E/R ↓ Cooling fan control module ↓ Cooling fan motor
Camshaft position sensor	- Engine speed*1		
Engine coolant temperature sensor	Engine coolant temperature		
Refrigerant pressure sensor	Refrigerant pressure		
Battery	Battery voltage*1		
	Vehicle speed*2		
Unified meter and A/C amp.	Air conditioner ON signal*2		
onlined meter and A/O amp.	A/C evaporator temperature*2		
	Target A/C evaporator temperature*2		

^{*1:} The ECM determines the start signal status by the signals of engine speed and battery voltage.

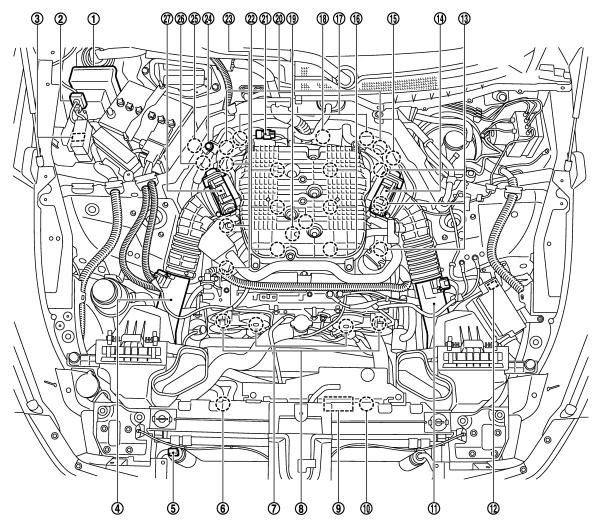
SYSTEM DESCRIPTION

ECM controls cooling fan speed corresponding to vehicle speed, engine coolant temperature, air conditioner ON signal, refrigerant pressure, target A/C evaporator temperature and A/C evaporator temperature. Cooling fan control signal is sent to IPDM E/R from ECM by CAN communication line. Then, IPDM E/R sends ON/OFF pulse duty signal to cooling fan control module. Corresponding to this ON/OFF pulse duty signal, cooling fan control module gives cooling fan motor operating voltage to cooling fan motors. Cooling fan speed is controlled by duty cycle of cooling fan motor operating voltage sent from cooling fan control module.

^{*2:} This signal is sent to ECM via the CAN communication line.

Component Parts Location

INFOID:0000000003856020



JMBIA1496ZZ

- 1. IPDM E/R
- 4. Mass air flow sensor (with intake air 5. temperature sensor) (bank 1)
- Intake valve timing control solenoid valve
- 10. Cooling fan motor-1
- 13. Ignition coil (with power transistor) and spark plug (bank 2)
- 16. Fuel injector (bank 2)
- 19. Knock sensor
- 22. Fuel injector (bank 1)
- 25. A/F sensor 1 (bank 1)

- 2. Battery current sensor
- Refrigerant pressure sensor
- 8. Exhaust valve timing control magnet 9. retarder
- Mass air flow sensor (with intake air 12. temperature sensor) (bank 2)
- 14. Electric throttle control actuator (bank 2)
- 17. Camshaft position sensor
- 20. Exhaust valve timing control position sensor
- 23. Ignition coil (with power transistor) and spark plug (bank 1)
- 26. Crankshaft position sensor

- 3. Cooling fan relay
- Cooling fan motor-2
- 9. Cooling fan control module
- 12. ICC brake hold relay (ICC models)
- 15. A/F sensor 1 (bank 2)
- 18. Engine coolant temperature sensor
- 21. EVAP canister purge volume control solenoid valve
- 24. EVAP service port
- 27. Electric throttle control actuator (bank 1)

EC

Α

D

Е

F

G

Н

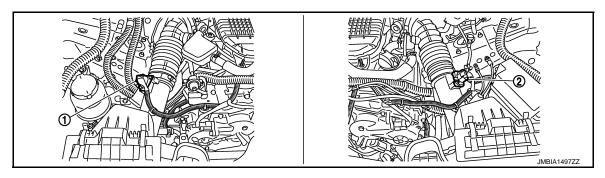
|

K

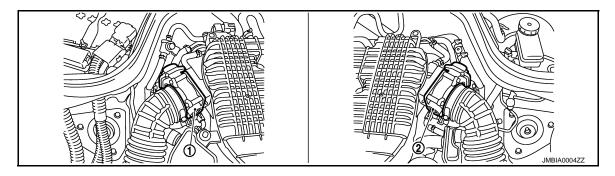
 \mathbb{N}

Ν

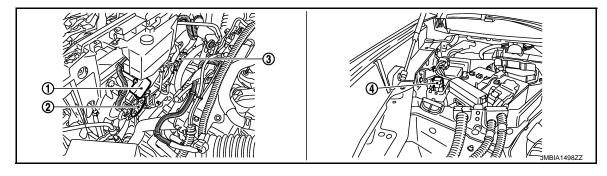
 \circ



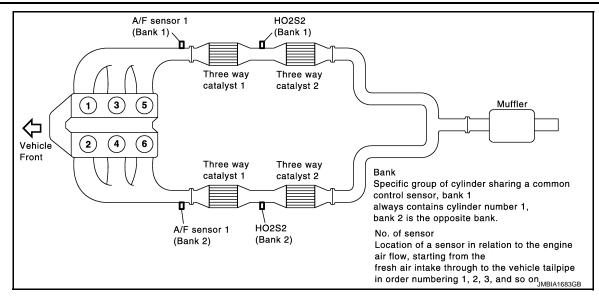
- Mass air flow sensor (with intake air 2. temperature sensor) (bank 1)
- Mass air flow sensor (with intake air temperature sensor) (bank 2)

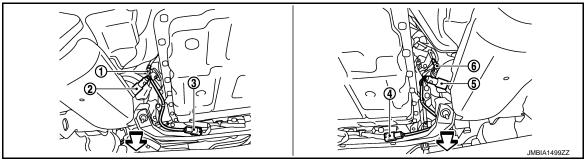


- Electric throttle control actuator (bank 1)
- 2. Electric throttle control actuator (bank 2)



- 1. Cooling fan control module
- Cooling fan relay
- 2. Cooling fan motor-1
- 3. Cooling fan motor-2

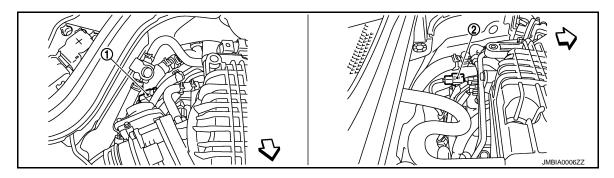




- 1. A/F sensor 1 (bank 2)
- 2. Heated oxygen sensor 2 (bank 2)
- Heated oxygen sensor 2 (bank 2) harness connector

- 4. Heated oxygen sensor 2 (bank 1) harness connector
- 5. Heated oxygen sensor 2 (bank 1)
- 6. A/F sensor 1 (bank 1)

∀
 : Vehicle front



- A/F sensor 1 (bank 1) harness con- 2. nector
 - A/F sensor 1 (bank 2) harness connector

∀ : Vehicle front

Α

EC

D

Е

F

G

Н

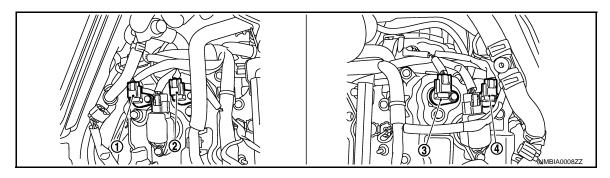
J

K

M

Ν

0

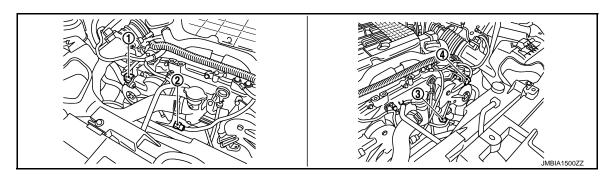


Exhaust valve timing control position 2. sensor (bank 1)

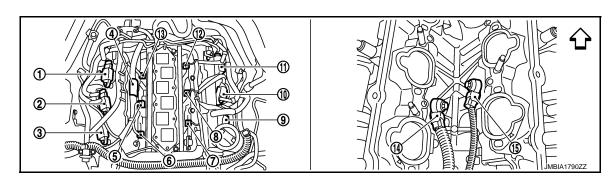
sensor (bank 2)

4.

- Exhaust valve timing control position
- Camshaft position sensor (bank 1)
- 3. Camshaft position sensor (bank 2)



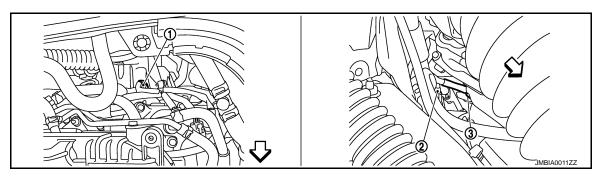
- Exhaust valve timing control magnet 2. retarder (bank 1) harness connector
- 4. Exhaust valve timing control magnet retarder (bank 2) harness connector
- Intake valve timing control solenoid valve (bank 1) harness connector
- Intake valve timing control solenoid valve (bank 2) harness connector



- Ignition coil No.5 (with power transis- 2. 1.
- Condenser 4.
- 7. Fuel injector No.2
- 10. Ignition coil No.4 (with power transis- 11. Ignition coil No.6 (with power transis- 12. Fuel injector No.6 tor)
- 13. Fuel injector No.5

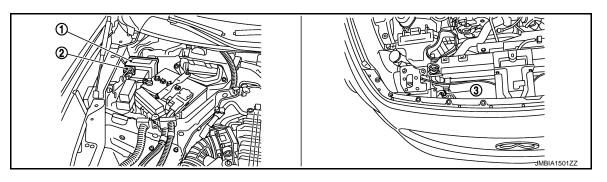
- Ignition coil No.3 (with power transis- 3.
- 5. Fuel injector No.3
- 8. Fuel injector No.4
- tor)
- 14. Knock sensor (bank 2)

- Ignition coil No.1 (with power transis-
- Fuel injector No.1
- Ignition coil No.2 (with power transistor)
- 15. Knock sensor (bank 1)



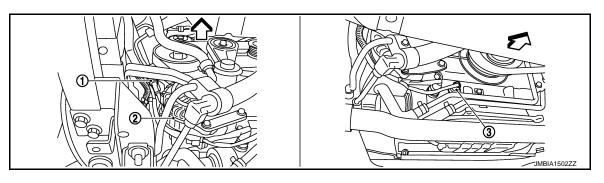
- Engine coolant temperature sensor 2.
 - A/F sensor 1 (bank 1)
- 3. Crankshaft position sensor

⟨□: Vehicle front



1. IPDM E/R

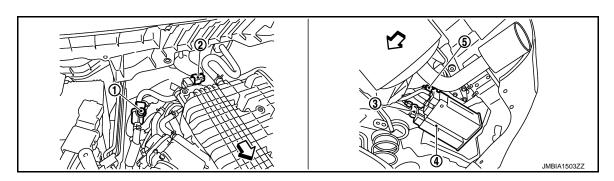
- Battery current sensor
- Refrigerant pressure sensor



- Power steering pressure sensor
- 2. Alternator

Engine oil temperature sensor

∀
 □: Vehicle front



- EVAP service port
- 2. EVAP canister purge volume control 3. EVAP canister vent control valve solenoid valve

EC-81 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

F

G

Н

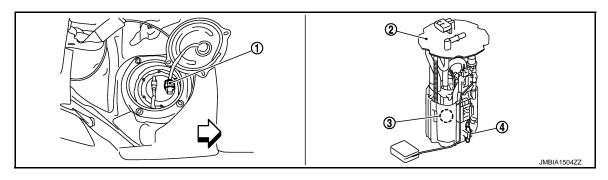
Ν

0

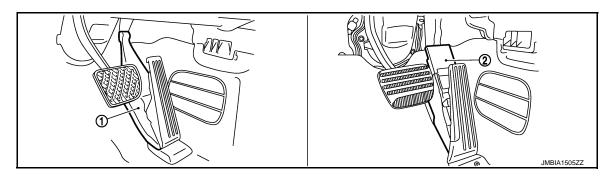
4. EVAP canister

EVAP control system pressure sensor

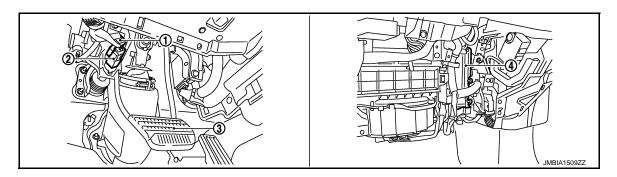
⟨¬: Vehicle front



- Fuel level sensor unit and fuel pump 2. Fuel level sensor unit and fuel pump 3. Fuel pressure regulator harness connector
- 4. Fuel tank temperature sensor
- ∀
 □: Vehicle front



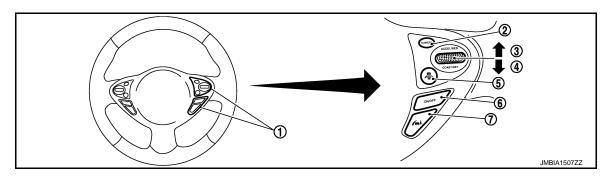
- Accelerator pedal position sensor (Without DCA system)
- Accelerator pedal position sensor (With DCA system)



1. Stop lamp switch

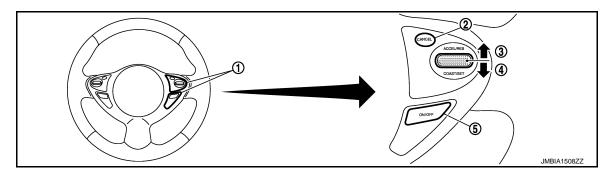
ASCD brake switch (ASCD models) 3. Brake pedal ICC brake switch (ICC models)

4. ECM



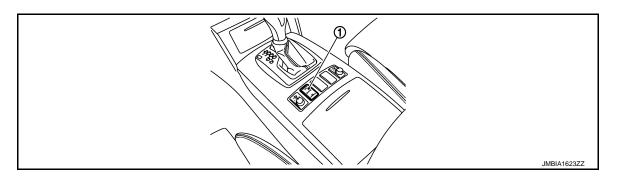
- 1. ICC steering switch
- 4. SET/COAST switch
- 7. LDP switch

- 2. CANCEL switch
- 5. DISTANCE switch
- 3. RESUME/ACCELERATE switch
- 6. MAIN switch



- 1. ASCD steering switch
- 4. SET/COAST switch
- 2. CANCEL switch
- 5. MAIN switch

3. RESUME/ACCELERATE switch



1. Snow mode switch

Component Description

INFOID:0000000003856021

Component	Reference
Camshaft position sensor	EC-275, "Description"
Crankshaft position sensor	EC-270, "Description"
Cooling fan control module	EC-466, "Description"
Cooling fan motor	EC-466, "Description"
Engine coolant temperature sensor	EC-188, "Description"
Refrigerant pressure sensor	EC-496, "Description"

Revision: 2009 March **EC-83** 2009 FX35/FX50

EC

Α

D

Е

F

G

Н

1

J

Κ

L

N /

0

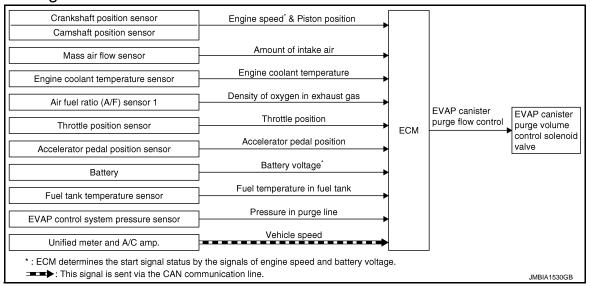
Ν

[VQ35HR]

EVAPORATIVE EMISSION SYSTEM

System Diagram

INFOID:0000000003856022



System Description

INFOID:0000000003856023

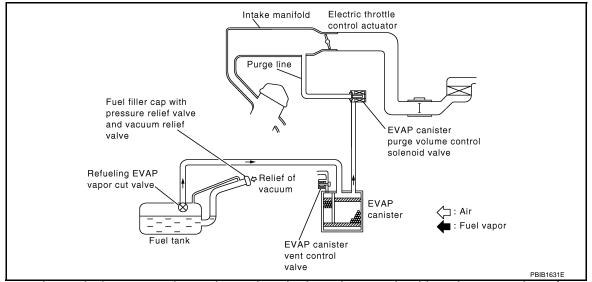
INPUT/OUTPUT SIGNAL CHART

Sensor	Input signal to ECM	ECM function	Actuator
Crankshaft position sensor	F		EVAP canister purge volume control solenoid valve
Camshaft position sensor	Engine speed*1 & Piston position		
Mass air flow sensor	Amount of intake air		
Engine coolant temperature sensor	Engine coolant temperature	EVAP canister purge flow control	
Battery	Battery voltage*1		
Throttle position sensor	Throttle position		
Accelerator pedal position sensor	Accelerator pedal position		
Air fuel ratio (A/F) sensor 1	Density of oxygen in exhaust gas (Mixture ratio feedback signal)		
Fuel tank temperature sensor	Fuel temperature in fuel tank		
EVAP control system pressure sensor	Pressure in purge line		
Unified meter and A/C amp.	Vehicle speed*2		

^{*1:} ECM determines the start signal status by the signals of engine speed and battery voltage.

^{*2:} This signal is sent to the ECM via the CAN communication line.

SYSTEM DESCRIPTION



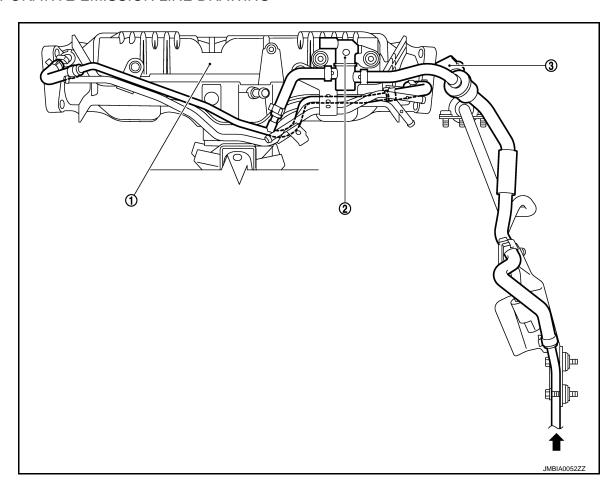
The evaporative emission system is used to reduce hydrocarbons emitted into the atmosphere from the fuel system. This reduction of hydrocarbons is accomplished by activated charcoals in the EVAP canister.

The fuel vapor in the sealed fuel tank is led into the EVAP canister which contains activated carbon and the vapor is stored there when the engine is not operating or when refueling to the fuel tank.

The vapor in the EVAP canister is purged by the air through the purge line to the intake manifold when the engine is operating. EVAP canister purge volume control solenoid valve is controlled by ECM. When the engine operates, the flow rate of vapor controlled by EVAP canister purge volume control solenoid valve is proportionally regulated as the air flow increases.

EVAP canister purge volume control solenoid valve also shuts off the vapor purge line during decelerating.

EVAPORATIVE EMISSION LINE DRAWING



Α

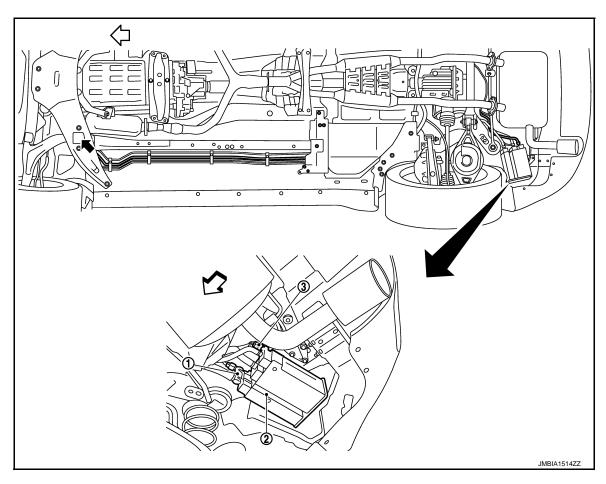
EC

D

Ν

Revision: 2009 March 2009 FX35/FX50

- 1. Intake manifold collector
- EVAP canister purge volume control 3. EVAP service port solenoid valve
- From next figure



- 1. EVAP canister vent control valve
- 2. EVAP canister

3. EVAP control system pressure sensor

- ∀
 : Vehicle front
- To previous figure

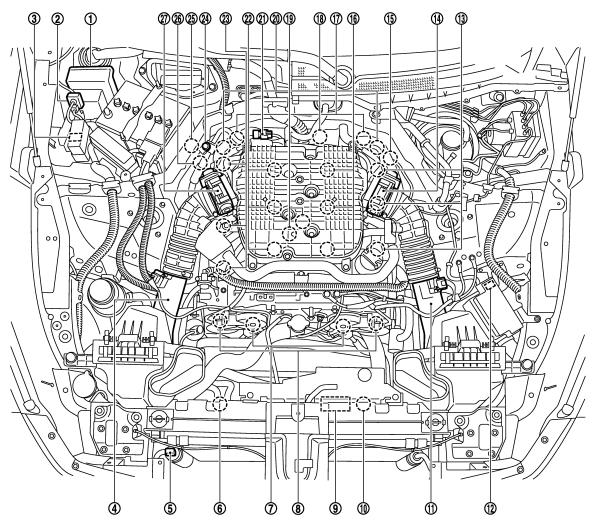
NOTE:

Do not use soapy water or any type of solvent while installing vacuum hose or purge hoses.

[VQ35HR]

Component Parts Location

INFOID:0000000003856024



JMBIA1496ZZ

- 1. IPDM E/R
- Mass air flow sensor (with intake air 5. temperature sensor) (bank 1)
- Intake valve timing control solenoid valve
- 10. Cooling fan motor-1
- 13. Ignition coil (with power transistor) and spark plug (bank 2)
- 16. Fuel injector (bank 2)
- 19. Knock sensor
- 22. Fuel injector (bank 1)
- 25. A/F sensor 1 (bank 1)

- 2. Battery current sensor
- 5. Refrigerant pressure sensor
- 8. Exhaust valve timing control magnet 9. retarder
 - Mass air flow sensor (with intake air 12. temperature sensor) (bank 2)
- 14. Electric throttle control actuator (bank 2)
- 17. Camshaft position sensor
- 20. Exhaust valve timing control position sensor
- 23. Ignition coil (with power transistor) and spark plug (bank 1)
- 26. Crankshaft position sensor

- Cooling fan relay
- Cooling fan motor-2
- 9. Cooling fan control module
- 12. ICC brake hold relay (ICC models)
- 15. A/F sensor 1 (bank 2)
- 18. Engine coolant temperature sensor
- 21. EVAP canister purge volume control solenoid valve
- 24. EVAP service port
- 27. Electric throttle control actuator (bank 1)

EC

Α

D

Е

F

G

Н

|

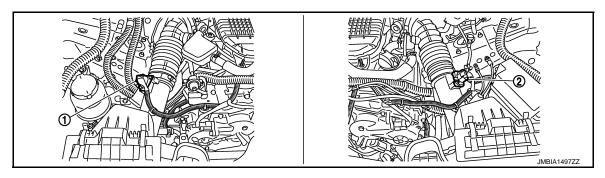
K

M

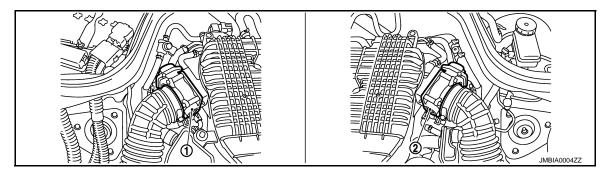
Ν

0

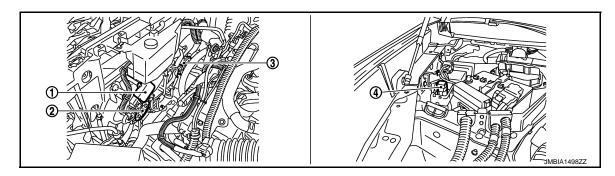
Р



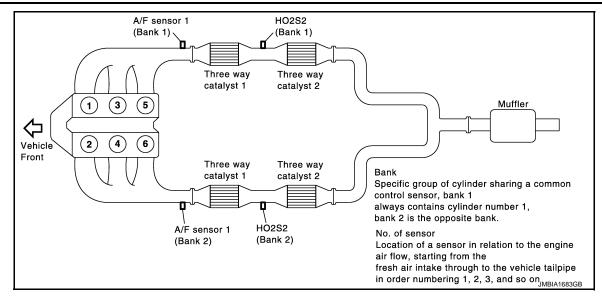
- Mass air flow sensor (with intake air 2. temperature sensor) (bank 1)
- Mass air flow sensor (with intake air temperature sensor) (bank 2)

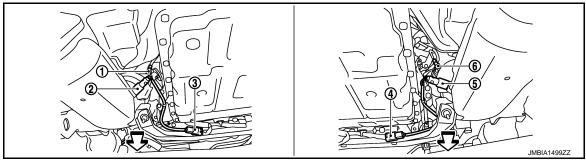


- Electric throttle control actuator (bank 1)
- 2. Electric throttle control actuator (bank 2)



- Cooling fan control module
- Cooling fan motor-1 Cooling fan relay
- 3. Cooling fan motor-2

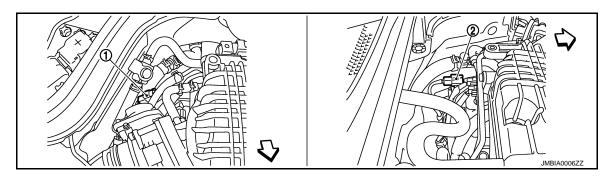




- 1. A/F sensor 1 (bank 2)
- 2. Heated oxygen sensor 2 (bank 2)
- 3. Heated oxygen sensor 2 (bank 2) harness connector

- 4. Heated oxygen sensor 2 (bank 1) harness connector
- 5. Heated oxygen sensor 2 (bank 1)
- 6. A/F sensor 1 (bank 1)

∀
 : Vehicle front



- A/F sensor 1 (bank 1) harness con- 2. nector
- A/F sensor 1 (bank 2) harness connector

∀
 : Vehicle front

Α

EC

D

Е

F

G

Н

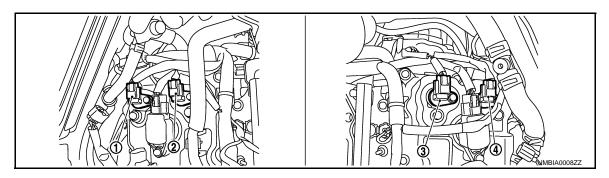
K

ı

M

Ν

0

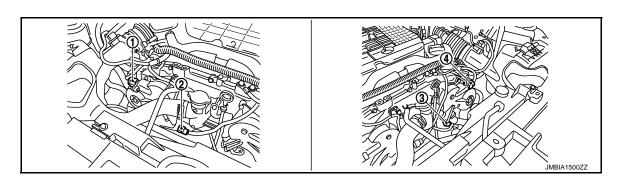


Exhaust valve timing control position 2. sensor (bank 1)

sensor (bank 2)

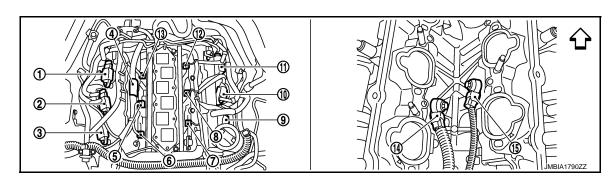
4.

- Exhaust valve timing control position
- Camshaft position sensor (bank 1)
- 3. Camshaft position sensor (bank 2)



- Exhaust valve timing control magnet 2. retarder (bank 1) harness connector
- 4. Exhaust valve timing control magnet retarder (bank 2) harness connector
- Intake valve timing control solenoid valve (bank 1) harness connector
- Intake valve timing control solenoid valve (bank 2) harness connector

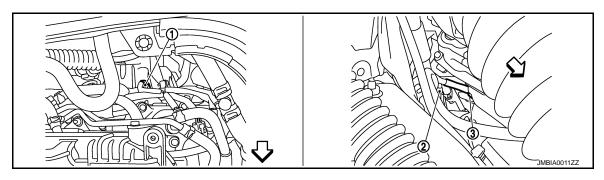
3.



- Ignition coil No.5 (with power transis- 2. 1.
- Condenser 4.
- 7. Fuel injector No.2
- 10. Ignition coil No.4 (with power transis- 11. Ignition coil No.6 (with power transis- 12. Fuel injector No.6 tor)
- 13. Fuel injector No.5

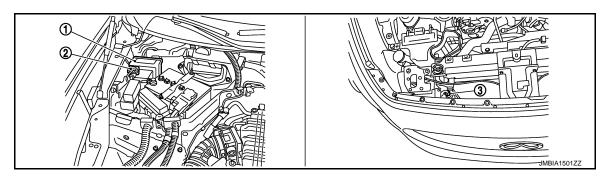
- Ignition coil No.3 (with power transis- 3.
- 5. Fuel injector No.3
- 8. Fuel injector No.4
- tor)
- 14. Knock sensor (bank 2)

- Ignition coil No.1 (with power transis-
- Fuel injector No.1
- Ignition coil No.2 (with power transistor)
- 15. Knock sensor (bank 1)



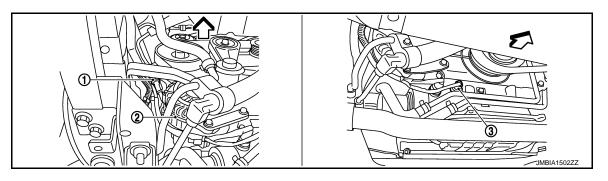
- Engine coolant temperature sensor 2.
 - A/F sensor 1 (bank 1)
- 3. Crankshaft position sensor

⟨□: Vehicle front



1. IPDM E/R

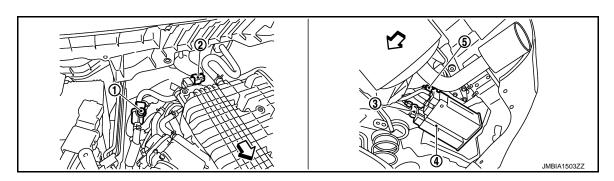
- Battery current sensor
- Refrigerant pressure sensor



- Power steering pressure sensor
- 2. Alternator

Engine oil temperature sensor

∀
 □: Vehicle front



- EVAP service port
- 2. EVAP canister purge volume control 3. EVAP canister vent control valve solenoid valve

EC-91 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

F

Н

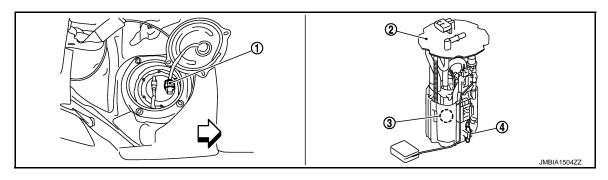
Ν

0

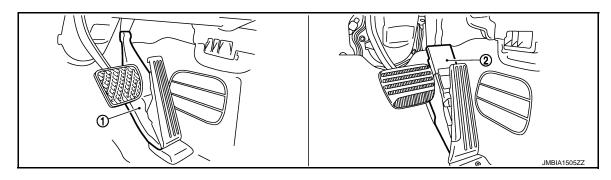
4. EVAP canister

5. EVAP control system pressure sensor

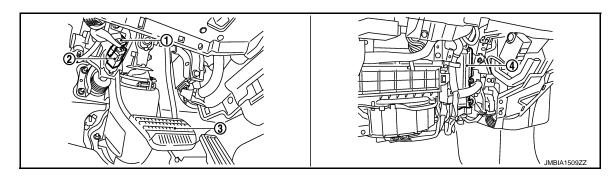
⟨¬: Vehicle front



- Fuel level sensor unit and fuel pump 2. Fuel level sensor unit and fuel pump 3. Fuel pressure regulator harness connector
- 4. Fuel tank temperature sensor
- ∀
 □: Vehicle front



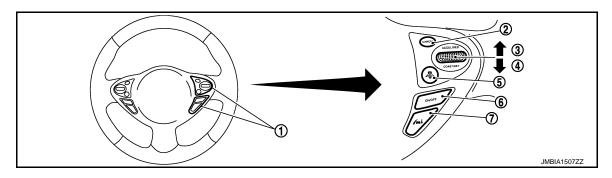
- Accelerator pedal position sensor (Without DCA system)
- 2. Accelerator pedal position sensor (With DCA system)



1. Stop lamp switch

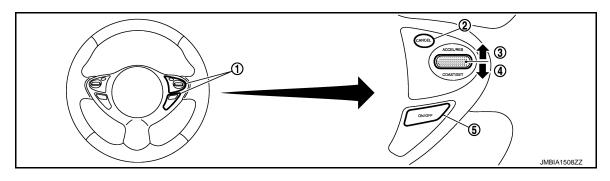
 ASCD brake switch (ASCD models) 3. Brake pedal ICC brake switch (ICC models)

4. ECM



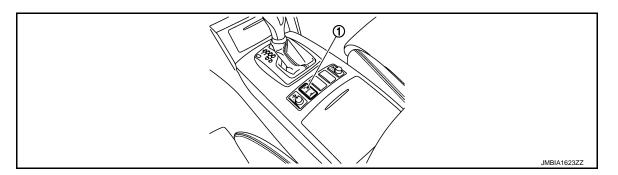
- ICC steering switch
- 4. SET/COAST switch
- 7. LDP switch

- 2. CANCEL switch
- 5. DISTANCE switch
- 3. RESUME/ACCELERATE switch
- 6. MAIN switch



- 1. ASCD steering switch
- 4. SET/COAST switch
- 2. CANCEL switch
- 5. MAIN switch

3. RESUME/ACCELERATE switch



1. Snow mode switch

Component Description

INFOID:0000000003856025

Component	Reference
A/F sensor 1	EC-202, "Description"
Accelerator pedal position sensor	EC-444, "Description"
Camshaft position sensor	EC-275, "Description"
Crankshaft position sensor	EC-270, "Description"
Engine coolant temperature sensor	EC-188, "Description"
EVAP canister purge volume control solenoid valve	EC-297, "Description"
EVAP control system pressure sensor	EC-313, "Description"
Fuel tank temperature sensor	EC-245. "Description"

Revision: 2009 March **EC-93** 2009 FX35/FX50

Α

EC

D

Е

F

G

Н

K

L

M

Ν

0

EVAPORATIVE EMISSION SYSTEM

< SYSTEM DESCRIPTION >

[VQ35HR]

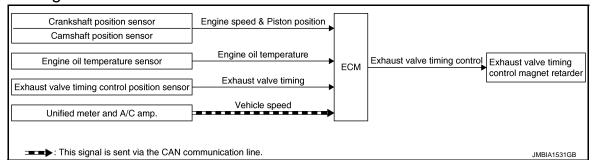
Component	Reference	
Mass air flow sensor	EC-170, "Description"	
Throttle position sensor	EC-191, "Description"	

[VQ35HR]

EXHAUST VALVE TIMING CONTROL

System Diagram

INFOID:0000000003856026



System Description

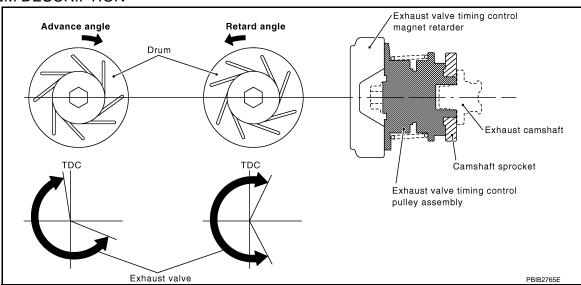
INFOID:0000000003856027

INPUT/OUTPUT SIGNAL CHART

Sensor	Input signal to ECM	ECM function	Actuator
Crankshaft position sensor	Engine speed & piston position	Exhaust valve timing control	Exhaust valve timing control magnet retarder
Camshaft position sensor	- Lingine speed & pistori position		
Engine oil temperature sensor	Engine oil temperature		
Exhaust valve timing control position sensor	Exhaust valve timing signal		
Unified meter and A/C amp.	Vehicle speed		

^{*:} This signal is sent to the ECM via the CAN Communication line.

SYSTEM DESCRIPTION



This mechanism magnetically controls cam phases continuously with the fixed operating angle of the exhaust valve.

The ECM receives signals such as crankshaft position, camshaft position, engine speed, and engine oil temperature. Then, the ECM sends ON/OFF pulse duty signals to the exhaust valve timing control magnet retarder depending on driving status. This makes it possible to control the shut/open timing of the exhaust valve to increase engine torque and output in a range of high engine speed.

Revision: 2009 March EC-95 2009 FX35/FX50

EC

Α

D

200003956037

G

-

,

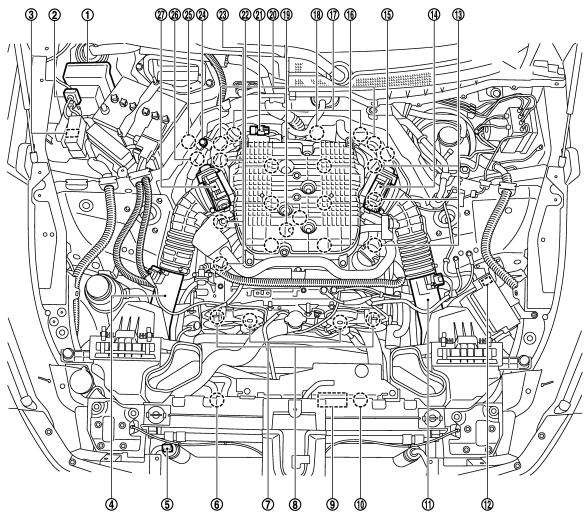
L

M

Ν

Component Parts Location

INFOID:0000000003856028

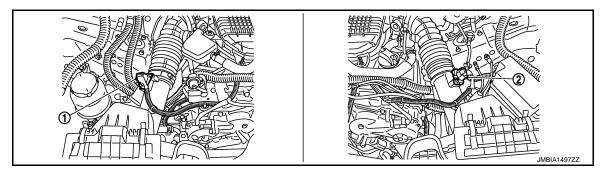


JMBIA149677

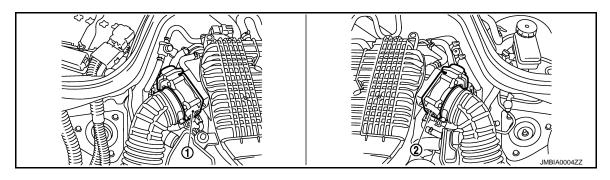
- IPDM E/R
- Mass air flow sensor (with intake air 5. temperature sensor) (bank 1)
- Intake valve timing control solenoid
- 10. Cooling fan motor-1
- 13. Ignition coil (with power transistor) and spark plug (bank 2)
- 16. Fuel injector (bank 2)
- 19. Knock sensor
- 22. Fuel injector (bank 1)
- 25. A/F sensor 1 (bank 1)

- 2. Battery current sensor
- Refrigerant pressure sensor
- 8. Exhaust valve timing control magnet 9. retarder
- 11. Mass air flow sensor (with intake air 12. ICC brake hold relay (ICC models) temperature sensor) (bank 2)
- 14. Electric throttle control actuator (bank 2)
- 17. Camshaft position sensor
- 23. Ignition coil (with power transistor) and spark plug (bank 1)
- 26. Crankshaft position sensor

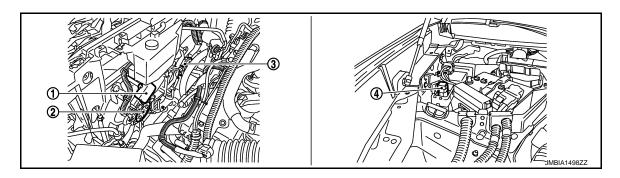
- Cooling fan relay
- Cooling fan motor-2
- Cooling fan control module
- 15. A/F sensor 1 (bank 2)
- 18. Engine coolant temperature sensor
- 20. Exhaust valve timing control position 21. EVAP canister purge volume control solenoid valve
 - 24. EVAP service port
 - 27. Electric throttle control actuator (bank 1)



- Mass air flow sensor (with intake air 2. temperature sensor) (bank 1)
- . Mass air flow sensor (with intake air temperature sensor) (bank 2)



- Electric throttle control actuator (bank 1)
- 2. Electric throttle control actuator (bank 2)



- 1. Cooling fan control module
- 4. Cooling fan relay
- 2. Cooling fan motor-1
- 3. Cooling fan motor-2

EC

Α

D

Е

F

G

Н

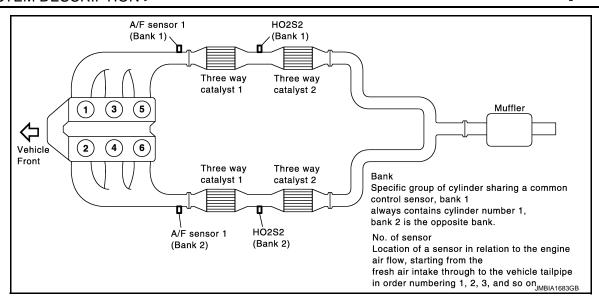
<

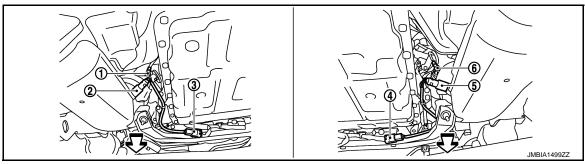
L

M

Ν

0

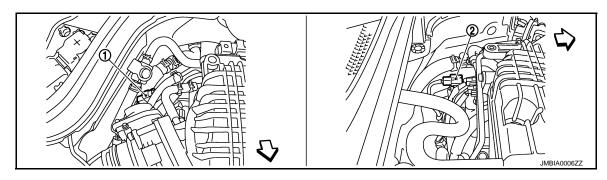




- 1. A/F sensor 1 (bank 2)
- 2. Heated oxygen sensor 2 (bank 2)
- 3. Heated oxygen sensor 2 (bank 2) harness connector

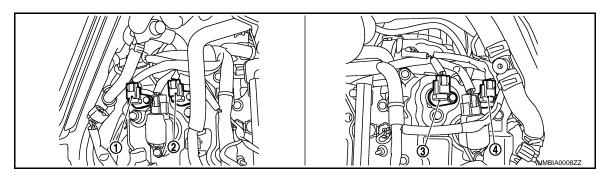
- 4. Heated oxygen sensor 2 (bank 1) harness connector
- 5. Heated oxygen sensor 2 (bank 1)
- 6. A/F sensor 1 (bank 1)

⟨□: Vehicle front



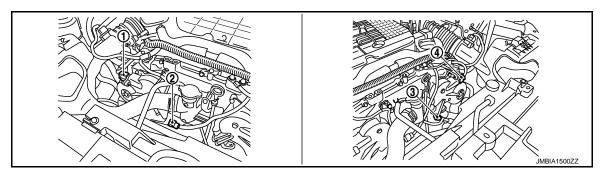
- 1. A/F sensor 1 (bank 1) harness con- 2. nector
- A/F sensor 1 (bank 2) harness connector

∀
 □: Vehicle front

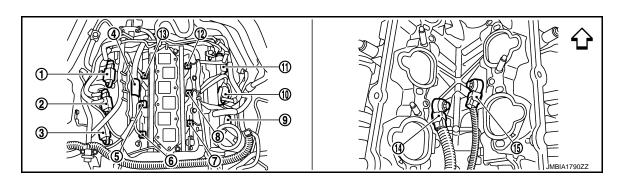


- Exhaust valve timing control position 2. sensor (bank 1)
 - Camshaft position sensor (bank 1)
- 3. Camshaft position sensor (bank 2)

4. Exhaust valve timing control position sensor (bank 2)



- Exhaust valve timing control magnet 2. retarder (bank 1) harness connector
- Exhaust valve timing control magnet retarder (bank 2) harness connector
- Intake valve timing control solenoid valve (bank 1) harness connector
- Intake valve timing control solenoid valve (bank 2) harness connector



- Ignition coil No.5 (with power transis- 2. 1.
- Condenser 4.
- 7. Fuel injector No.2
- tor)
- 13. Fuel injector No.5

- Ignition coil No.3 (with power transis- 3.
- 5. Fuel injector No.3
- 8. Fuel injector No.4
- 10. Ignition coil No.4 (with power transis- 11. Ignition coil No.6 (with power transis- 12. Fuel injector No.6
 - 14. Knock sensor (bank 2)

- Ignition coil No.1 (with power transis-
- Fuel injector No.1 6.
- Ignition coil No.2 (with power transistor)
- 15. Knock sensor (bank 1)

Α

EC

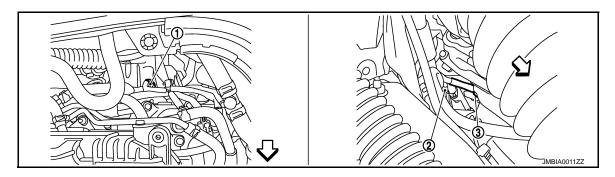
D

Е

Н

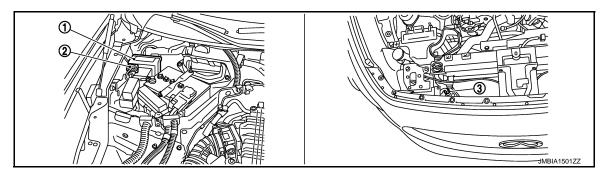
M

Ν



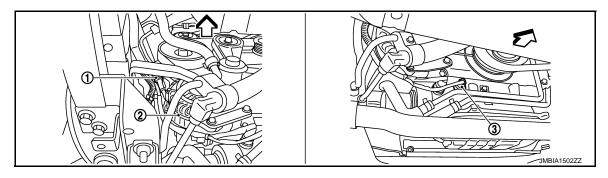
- Engine coolant temperature sensor 2. A/F sensor 1 (bank 1)
- Crankshaft position sensor

∀
 : Vehicle front



IPDM E/R

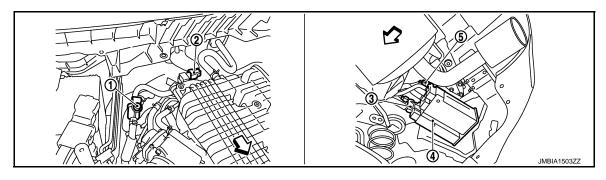
- Battery current sensor
- Refrigerant pressure sensor



- Power steering pressure sensor
- 2. Alternator

Engine oil temperature sensor

∀
 □: Vehicle front



- 1. EVAP service port
- EVAP canister purge volume control 3. EVAP canister vent control valve solenoid valve

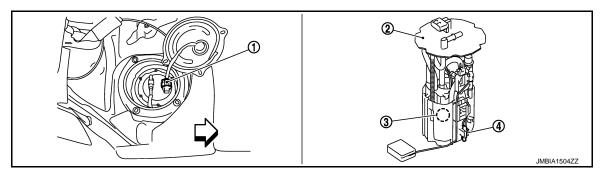
EXHAUST VALVE TIMING CONTROL

< SYSTEM DESCRIPTION > [VQ35HR]

4. EVAP canister

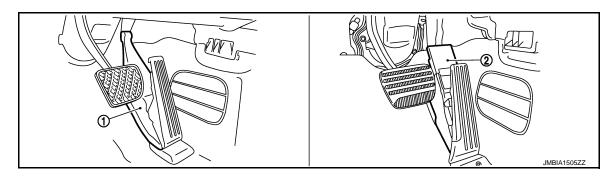
EVAP control system pressure sensor

∀
 □: Vehicle front

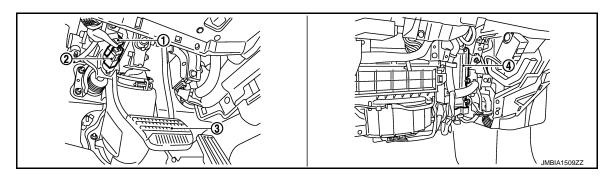


- 1. Fuel level sensor unit and fuel pump 2. Fuel level sensor unit and fuel pump 3. Fuel pressure regulator harness connector
- 4. Fuel tank temperature sensor

∀ : Vehicle front



- Accelerator pedal position sensor (Without DCA system)
- 2. Accelerator pedal position sensor (With DCA system)



- 1. Stop lamp switch
- ASCD brake switch (ASCD models)
 Brake pedal ICC brake switch (ICC models)

4. ECM

EC

Α

D

Е

F

G

Н

I

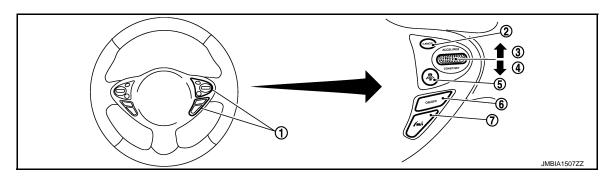
J

K

M

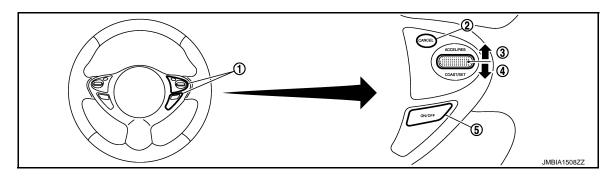
Ν

0



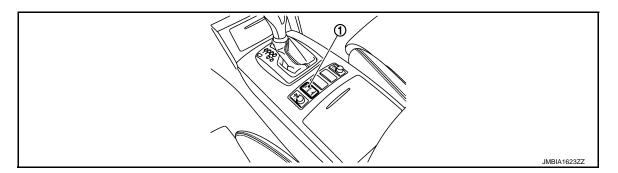
- ICC steering switch
- 4. SET/COAST switch
- 7. LDP switch

- 2. CANCEL switch
- 5. DISTANCE switch
- 3. RESUME/ACCELERATE switch
- 6. MAIN switch



- ASCD steering switch
 SET/COAST switch
- 2. CANCEL switch
- 5. MAIN switch

3. RESUME/ACCELERATE switch



1. Snow mode switch

Component Description

INFOID:0000000003856029

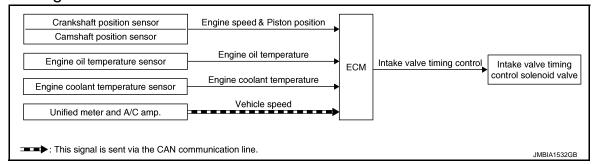
Component	Reference
Camshaft position sensor	EC-275, "Description"
Crankshaft position sensor	EC-270, "Description"
Engine oil temperature sensor	EC-251, "Description"
Exhaust valve timing control magnet retarder	EC-167, "Description"
Exhaust valve timing control position sensor	EC-367, "Description"

[VQ35HR]

INTAKE VALVE TIMING CONTROL

System Diagram

INFOID:0000000003856030



System Description

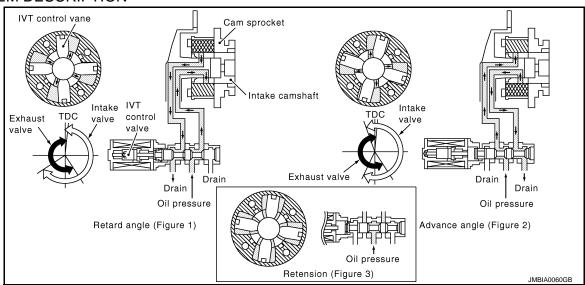
INFOID:0000000003856031

INPUT/OUTPUT SIGNAL CHART

Sensor	Input signal to ECM	ECM function	Actuator
Crankshaft position sensor	Engine speed & piston position		Intake valve timing control solenoid valve
Camshaft position sensor	Engine speed & pistori position		
Engine oil temperature sensor	Engine oil temperature	Intake valve timing control	
Engine coolant temperature sensor	Engine coolant temperature		
Unified meter and A/C amp.	Vehicle speed*		

^{*:} This signal is sent to the ECM via the CAN communication line.

SYSTEM DESCRIPTION



This mechanism hydraulically controls cam phases continuously with the fixed operating angle of the intake

The ECM receives signals such as crankshaft position, camshaft position, engine speed, and engine coolant temperature. Then, the ECM sends ON/OFF pulse duty signals to the intake valve timing (IVT) control solenoid valve depending on driving status. This makes it possible to control the shut/open timing of the intake valve to increase engine torque in low/mid speed range and output in high-speed range.

EC-103 Revision: 2009 March 2009 FX35/FX50

EC

Α

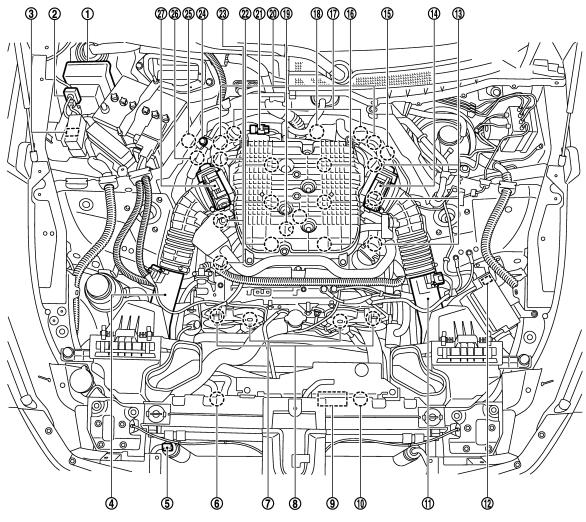
D

Е

Ν

Component Parts Location

INFOID:0000000003856032

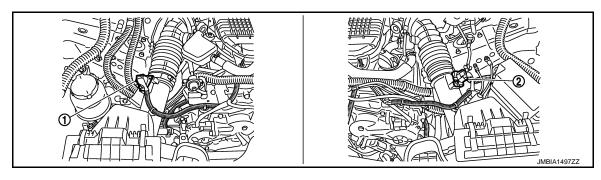


JMBIA149677

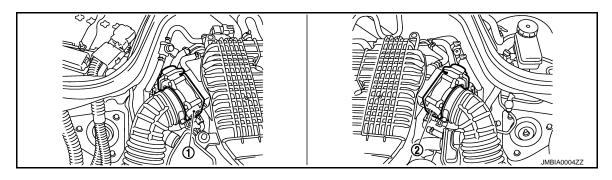
- IPDM E/R
- Mass air flow sensor (with intake air 5. temperature sensor) (bank 1)
- Intake valve timing control solenoid
- 10. Cooling fan motor-1
- 13. Ignition coil (with power transistor) and spark plug (bank 2)
- 16. Fuel injector (bank 2)
- 19. Knock sensor
- 22. Fuel injector (bank 1)
- 25. A/F sensor 1 (bank 1)

- 2. Battery current sensor
- Refrigerant pressure sensor
- 8. Exhaust valve timing control magnet 9. retarder
- 11. Mass air flow sensor (with intake air 12. ICC brake hold relay (ICC models) temperature sensor) (bank 2)
- 14. Electric throttle control actuator (bank 2)
- 17. Camshaft position sensor
- 23. Ignition coil (with power transistor) and spark plug (bank 1)
- 26. Crankshaft position sensor

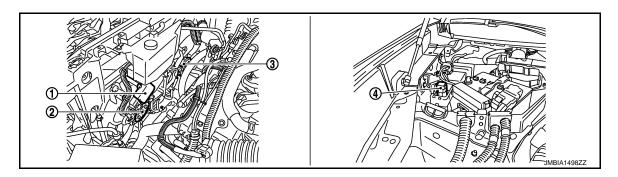
- Cooling fan relay
- Cooling fan motor-2
- Cooling fan control module
- 15. A/F sensor 1 (bank 2)
- 18. Engine coolant temperature sensor
- 20. Exhaust valve timing control position 21. EVAP canister purge volume control solenoid valve
 - 24. EVAP service port
 - 27. Electric throttle control actuator (bank 1)



- . Mass air flow sensor (with intake air 2. temperature sensor) (bank 1)
- Mass air flow sensor (with intake air temperature sensor) (bank 2)



- Electric throttle control actuator (bank 1)
- 2. Electric throttle control actuator (bank 2)



- 1. Cooling fan control module
- 4. Cooling fan relay
- 2. Cooling fan motor-1
- 3. Cooling fan motor-2

EC

Α

D

Е

F

G

Н

J

K

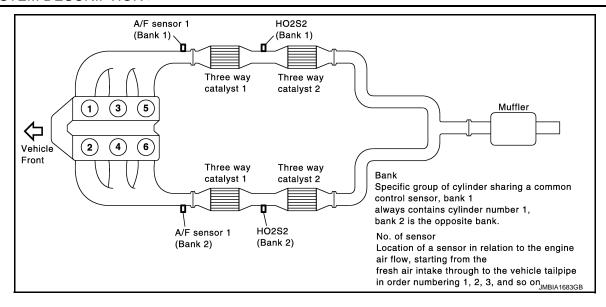
L

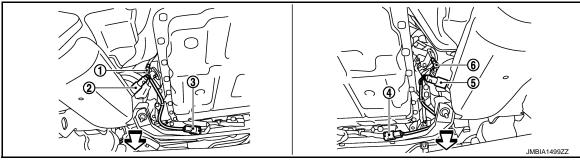
M

Ν

0

Ρ

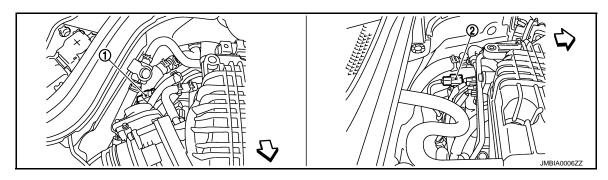




- 1. A/F sensor 1 (bank 2)
- 2. Heated oxygen sensor 2 (bank 2)
- 3. Heated oxygen sensor 2 (bank 2) harness connector

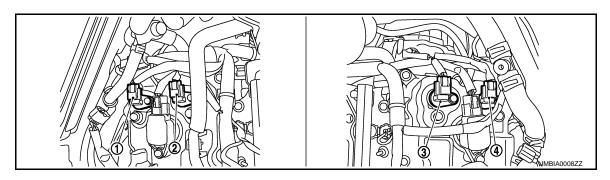
- 4. Heated oxygen sensor 2 (bank 1) harness connector
- 5. Heated oxygen sensor 2 (bank 1)
- 6. A/F sensor 1 (bank 1)

⟨□: Vehicle front



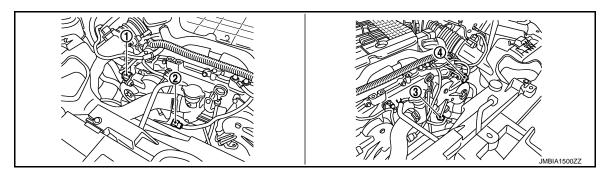
- 1. A/F sensor 1 (bank 1) harness con- 2. nector
- A/F sensor 1 (bank 2) harness connector

∀
 □: Vehicle front

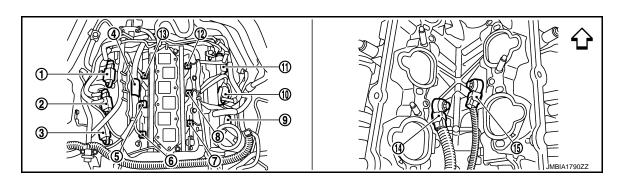


- Exhaust valve timing control position 2. sensor (bank 1)
 - Camshaft position sensor (bank 1)
- 3. Camshaft position sensor (bank 2)

4. Exhaust valve timing control position sensor (bank 2)



- Exhaust valve timing control magnet 2. retarder (bank 1) harness connector
- Exhaust valve timing control magnet retarder (bank 2) harness connector
- Intake valve timing control solenoid valve (bank 1) harness connector
- Intake valve timing control solenoid valve (bank 2) harness connector



- Ignition coil No.5 (with power transis- 2. 1.
- Condenser 4.
- 7. Fuel injector No.2
- 10. Ignition coil No.4 (with power transis- 11. Ignition coil No.6 (with power transis- 12. Fuel injector No.6 tor)
- 13. Fuel injector No.5

- Ignition coil No.3 (with power transis- 3.
- 5. Fuel injector No.3
- 8. Fuel injector No.4
- 14. Knock sensor (bank 2)

- Ignition coil No.1 (with power transis-
- Fuel injector No.1 6.

3.

- Ignition coil No.2 (with power transistor)
- 15. Knock sensor (bank 1)

Α

EC

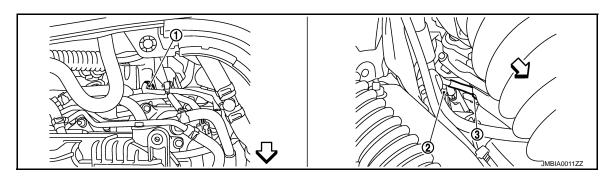
D

Е

Н

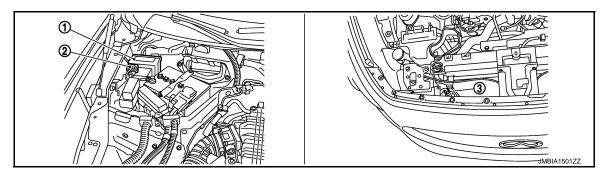
M

Ν



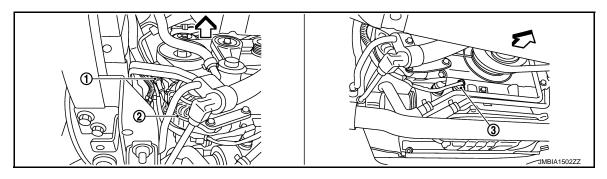
- Engine coolant temperature sensor 2. A/F sensor 1 (bank 1)
- Crankshaft position sensor

∀
 : Vehicle front



IPDM E/R

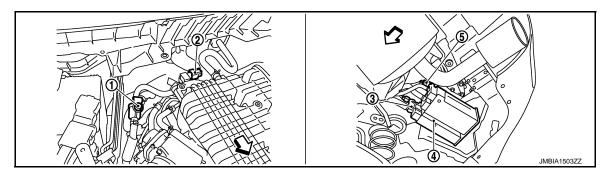
- Battery current sensor
- Refrigerant pressure sensor



- Power steering pressure sensor
- 2. Alternator

Engine oil temperature sensor

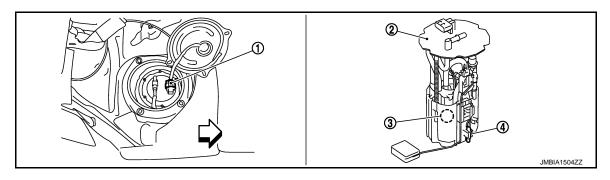
∀
 □: Vehicle front



- 1. EVAP service port
- EVAP canister purge volume control 3. EVAP canister vent control valve solenoid valve

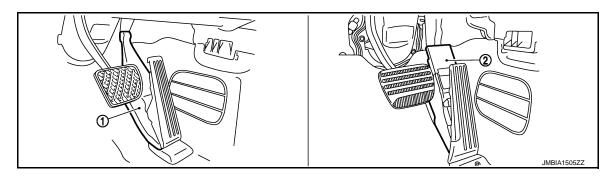
4. EVAP canister

EVAP control system pressure sensor

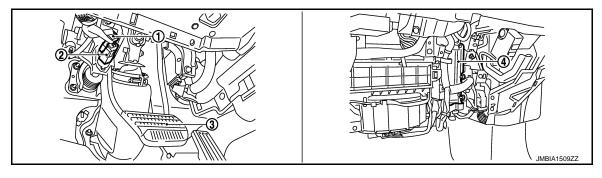


- Fuel level sensor unit and fuel pump 2. Fuel level sensor unit and fuel pump 3. Fuel pressure regulator harness connector
- 4. Fuel tank temperature sensor

∀ : Vehicle front



- Accelerator pedal position sensor (Without DCA system)
- Accelerator pedal position sensor (With DCA system)



- 1. Stop lamp switch
- 2. ASCD brake switch (ASCD models) 3. Brake pedal ICC brake switch (ICC models)

4. ECM

EC

Α

D

Е

F

G

Н

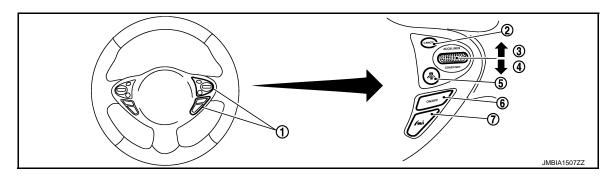
I

K

M

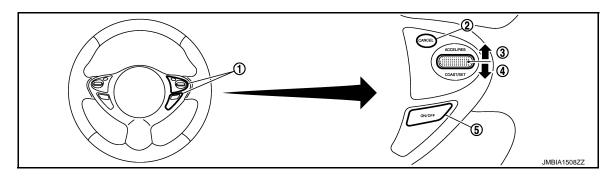
N

0



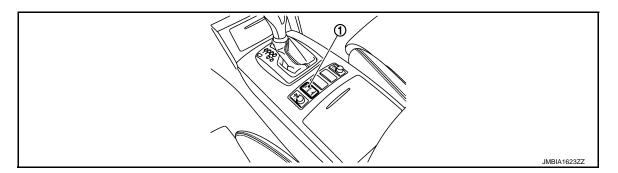
- 1. ICC steering switch
- 4. SET/COAST switch
- 7. LDP switch

- 2. CANCEL switch
- 5. DISTANCE switch
- 3. RESUME/ACCELERATE switch
- 6. MAIN switch



- 1. ASCD steering switch
- 2. CANCEL switch
- SET/COAST switch 5. MAIN switch

3. RESUME/ACCELERATE switch



1. Snow mode switch

Component Description

INFOID:0000000003856033

Component	Reference
Camshaft position sensor	EC-275, "Description"
Crankshaft position sensor	EC-270, "Description"
Engine coolant temperature sensor	EC-188, "Description"
Intake valve timing control solenoid valve	EC-164, "Description"

< SYSTEM DESCRIPTION >

[VQ35HR]

ON BOARD DIAGNOSTIC (OBD) SYSTEM

Diagnosis Description

INFOID:0000000003856034

Α

EC

D

Е

Н

M

N

INTRODUCTION

The ECM has an on board diagnostic system, which detects malfunctions related to engine sensors or actuators. The ECM also records various emission-related diagnostic information including:

Emission-related diagnostic information	Diagnostic service			
Diagnostic Trouble Code (DTC)	Service \$03 of SAE J1979			
Freeze Frame data	Service \$02 of SAE J1979			
System Readiness Test (SRT) code	Service \$01 of SAE J1979			
1st Trip Diagnostic Trouble Code (1st Trip DTC)	Service \$07 of SAE J1979			
1st Trip Freeze Frame data	-			
Test values and Test limits	Service \$06 of SAE J1979			
Calibration ID	Service \$09 of SAE J1979			

The above information can be checked using procedures listed in the table below.

 \times : Applicable —: Not applicable

	DTC	1st trip DTC	Freeze Frame data	1st trip Freeze Frame data	SRT code	SRT status	Test value
CONSULT-III	×	×	×	×	×	×	_
GST	×	×	×	_	×	×	×
ECM	×	×*	_	_	_	×	_

^{*:} When DTC and 1st trip DTC simultaneously appear on the display, they cannot be clearly distinguished from each other.

The malfunction indicator lamp (MIL) on the instrument panel illuminates when the same malfunction is detected in two consecutive trips (Two trip detection logic), or when the ECM enters fail-safe mode. (Refer to EC-538, "Fail-safe".)

TWO TRIP DETECTION LOGIC

When a malfunction is detected for the first time, 1st trip DTC and 1st trip Freeze Frame data are stored in the ECM memory. The MIL will not illuminate at this stage. <1st trip>

If the same malfunction is detected again during the next drive, the DTC and Freeze Frame data are stored in the ECM memory, and the MIL illuminates. The MIL illuminates at the same time when the DTC is stored. <2nd trip> The "trip" in the "Two Trip Detection Logic" means a driving mode in which self-diagnosis is performed during vehicle operation. Specific on board diagnostic items will cause the ECM to illuminate or blink the MIL, and store DTC and Freeze Frame data, even in the 1st trip, as shown below.

×: Applicable —: Not applicable

		M	IL		D	TC	1st trip DTC		
Items	1s	t trip	2nd	l trip	1st trip	2nd trip	1st trip	2nd trip	
	Blinking	Illuminate	Blinking	Illuminate	displaying	displaying	displaying	display- ing	
Misfire (Possible three way catalyst damage) — DTC: P0300 - P0306 is being detected	×	_	_	_	_	_	×	_	
Misfire (Possible three way catalyst damage) — DTC: P0300 - P0306 is being detected	_	_	×	_	_	×	_	_	
One trip detection diagnoses (Refer to EC-542, "DTC Index".)	_	×	_	_	×	_	_	_	
Except above	_	_	_	×	_	×	×	_	

DTC AND FREEZE FRAME DATA

DTC and 1st Trip DTC

Revision: 2009 March **EC-111** 2009 FX35/FX50

[VQ35HR]

The 1st trip DTC (whose number is the same as the DTC number) is displayed for the latest self-diagnostic result obtained. If the ECM memory was cleared previously, and the 1st trip DTC did not recur, the 1st trip DTC will not be displayed.

If a malfunction is detected during the 1st trip, the 1st trip DTC is saved in the ECM memory. The MIL will not illuminate (two trip detection logic). If the same malfunction is not detected in the 2nd trip (meeting the required driving pattern), the 1st trip DTC is cleared from the ECM memory. If the same malfunction is detected in the 2nd trip, both the 1st trip DTC and DTC are stored in the ECM memory and the MIL illuminates. In other words, the DTC is stored in the ECM memory and the MIL lights up when the same malfunction occurs in two consecutive trips. If a 1st trip DTC is saved and a non-diagnostic operation is performed between the 1st and 2nd trips, only the 1st trip DTC will continue to be stored. For malfunctions that blink or illuminate the MIL during the 1st trip, the DTC and 1st trip DTC are stored in the ECM memory.

Procedures for clearing the DTC and the 1st trip DTC from the ECM memory are described in "How to Erase DTC and 1st trip DTC".

For malfunctions in which 1st trip DTCs are displayed, refer to <u>EC-542, "DTC Index"</u>. These items are required by legal regulations to continuously monitor the system/component. In addition, the items monitored non-continuously are also displayed on CONSULT-III.

1st trip DTC is specified in Service \$07 of SAE J1979. 1st trip DTC detection occurs without illuminating the MIL and therefore does not warn the driver of a malfunction. However, 1st trip DTC detection will not prevent the vehicle from being tested, for example during Inspection/Maintenance (I/M) tests.

When a 1st trip DTC is detected, check, print out or write down and erase (1st trip) DTC and Freeze Frame data as specified in Work Flow procedure Step 2, refer to <u>EC-16</u>, "Work Flow". Then perform DTC Confirmation Procedure or Component Function Check to try to duplicate the malfunction. If the malfunction is duplicated, the item requires repair.

Freeze Frame Data and 1st Trip Freeze Frame Data

The ECM records the driving conditions such as fuel system status, calculated load value, engine coolant temperature, short-term fuel trim, long-term fuel trim, engine speed, vehicle speed, absolute throttle position, base fuel schedule and intake air temperature at the moment a malfunction is detected.

Data which are stored in the ECM memory, along with the 1st trip DTC, are called 1st trip freeze frame data. The data, stored together with the DTC data, are called freeze frame data and displayed on CONSULT-III or GST. The 1st trip freeze frame data can only be displayed on the CONSULT-III screen, not on the GST.

Only one set of freeze frame data (either 1st trip freeze frame data or freeze frame data) can be stored in the ECM. 1st trip freeze frame data is stored in the ECM memory along with the 1st trip DTC. There is no priority for 1st trip freeze frame data and it is updated each time a different 1st trip DTC is detected. However, once freeze frame data (2nd trip detection/MIL on) is stored in the ECM memory, 1st trip freeze frame data is no longer stored. Remember, only one set of freeze frame data can be stored in the ECM. The ECM has the following priorities to update the data.

Priority	Items					
1	Freeze frame data	Misfire — DTC: P0300 - P0306 Fuel Injection System Function — DTC: P0171, P0172, P0174, P0175				
2		Except the above items (Includes A/T related items)				
3	1st trip freeze frame data					

For example, the EGR malfunction (Priority: 2) was detected and the freeze frame data was saved in the 2nd trip. After that when the misfire (Priority: 1) is detected in another trip, the freeze frame data will be updated from the EGR malfunction to the misfire. The 1st trip freeze frame data is updated each time a different malfunction is detected. There is no priority for 1st trip freeze frame data. However, once freeze frame data is stored in the ECM memory, 1st trip freeze data is no longer stored (because only one freeze frame data or 1st trip freeze frame data can be stored in the ECM). If freeze frame data is stored in the ECM memory and freeze frame data with the same priority occurs later, the first (original) freeze frame data remains unchanged in the ECM memory.

Both 1st trip freeze frame data and freeze frame data (along with the DTCs) are cleared when the ECM memory is erased. Procedures for clearing the ECM memory are described in "How to Erase DTC and 1st trip DTC".

How to Read DTC and 1st Trip DTC

(P)With CONSULT-III

With GST

CONSULT-III or GST (Generic Scan Tool) Examples: P0340, P0850, P1148, etc.

These DTCs are prescribed by SAE J2012.

[VQ35HR] < SYSTEM DESCRIPTION >

(CONSULT-III also displays the malfunctioning component or system.)

No Tools

The number of blinks of the MIL in the Diagnostic Test Mode II (Self-Diagnostic Results) indicates the DTC. Example: 0340, 0850, 1148, etc.

These DTCs are controlled by NISSAN.

- 1st trip DTC No. is the same as DTC No.
- Output of a DTC indicates a malfunction. However, GST and the Diagnostic Test Mode II do not indicate whether the malfunction is still occurring or has occurred in the past and has returned to normal. CONSULT-III can identify malfunction status as shown below. Therefore, using CONSULT-III (if available) is recommended.

DTC or 1st trip DTC of a malfunction is displayed in SELF-DIAGNOSTIC RESULTS mode of CONSULT-III. Time data indicates how many times the vehicle was driven after the last detection of a DTC.

If the DTC is being detected currently, the time data will be [0].

If a 1st trip DTC is stored in the ECM, the time data will be [1t].

How to Erase DTC and 1st Trip DTC

(P) With CONSULT-III

NOTE:

- If the ignition switch stays ON after repair work, be sure to turn ignition OFF once. Wait at least 10 seconds and then turn it ON (engine stopped) again.
- If the DTC is not for A/T related items (see EC-542, "DTC Index"), skip step 1.
- Erase DTC in TCM. Refer to TM-74, "Diagnosis Description".
- Select "ENGINE" with CONSULT-III. 2.
- Select "SELF-DIAG RESULTS".
- Touch "ERASE". (DTC in ECM will be erased.)

With GST

NOTE:

- If the ignition switch stays ON after repair work, be sure to turn ignition switch OFF once. Wait at least 10 seconds and then turn it ON (engine stopped) again.
- 1. Select Service \$04 with GST (Generic Scan Tool).

No Tools

NOTE:

- If the ignition switch stays ON after repair work, be sure to turn ignition switch OFF once. Wait at least 10 seconds and then turn it ON (engine stopped) again.
- Erase DTC in ECM. Refer to How To ERASE DIAGNOSTIC TEST MODE II (SELF-DIAGNOSTIC RESULTS).
- If the battery is disconnected, the emission-related diagnostic information will be cleared within 24
- The following data are cleared when the ECM memory is erased.
- Diagnostic trouble codes
- 1st trip diagnostic trouble codes
- Freeze frame data
- 1st trip freeze frame data
- System readiness test (SRT) codes
- Test values

Actual work procedures are explained using a DTC as an example. Be careful so that not only the DTC, but all of the data listed above, are cleared from the ECM memory during work procedures.

SYSTEM READINESS TEST (SRT) CODE

System Readiness Test (SRT) code is specified in Service \$01 of SAE J1979.

As part of an enhanced emissions test for Inspection & Maintenance (I/M), certain states require the status of SRT be used to indicate whether the ECM has completed self-diagnosis of major emission systems and components. Completion must be verified in order for the emissions inspection to proceed.

If a vehicle is rejected for a State emissions inspection due to one or more SRT items indicating "INCMP", use the information in this Service Manual to set the SRT to "CMPLT".

In most cases the ECM will automatically complete its self-diagnosis cycle during normal usage, and the SRT status will indicate "CMPLT" for each application system. Once set as "CMPLT", the SRT status remains "CMPLT" until the self-diagnosis memory is erased.

Occasionally, certain portions of the self-diagnostic test may not be completed as a result of the customer's normal driving pattern; the SRT will indicate "INCMP" for these items.

EC

Α

D

Е

Н

L

Ν

2009 FX35/FX50

NOTE:

The SRT will also indicate "INCMP" if the self-diagnosis memory is erased for any reason or if the ECM memory power supply is interrupted for several hours.

If, during the state emissions inspection, the SRT indicates "CMPLT" for all test items, the inspector will continue with the emissions test. However, if the SRT indicates "INCMP" for one or more of the SRT items the vehicle is returned to the customer untested.

NOTE:

If MIL is ON during the state emissions inspection, the vehicle is also returned to the customer untested even though the SRT indicates "CMPLT" for all test items. Therefore, it is important to check SRT ("CMPLT") and DTC (No DTCs) before the inspection.

SRT Item

The table below shows required self-diagnostic items to set the SRT to "CMPLT".

SRT item (CONSULT-III indication)	Performance Priority*	Required self-diagnostic items to set the SRT to "CMPLT"	Corresponding DTC No.
CATALYST	2	Three way catalyst function	P0420, P0430
EVAP SYSTEM	2	EVAP control system purge flow monitoring	P0441
	1	EVAP control system	P0442
	2	EVAP control system	P0456
HO2S	2	Air fuel ratio (A/F) sensor 1	P0133, P0153
		Heated oxygen sensor 2	P0137, P0157
		Heated oxygen sensor 2	P0138, P0158
		Heated oxygen sensor 2	P0139, P0159

^{*:} If completion of several SRTs is required, perform driving patterns (DTC confirmation procedure), one by one based on the priority for models with CONSULT-III.

SRT Set Timing

SRT is set as "CMPLT" after self-diagnosis has been performed one or more times. Completion of SRT is done regardless of whether the result is OK or NG. The set timing is different between OK and NG results and is shown in the table below.

				Example					
Self-diagnosis result		Diagnosis	$\begin{array}{cccccccccccccccccccccccccccccccccccc$						
All OK	Case 1	P0400	OK (1)	— (1)	OK (2)	— (2)			
		P0402	OK (1)	— (1)	—(1)	OK (2)			
		P1402	OK (1)	OK (2)	— (2)	— (2)			
		SRT of EGR	"CMPLT"	"CMPLT"	"CMPLT"	"CMPLT"			
	Case 2	P0400	OK (1)	— (1)	—(1)	— (1)			
		P0402	— (0)	— (0)	OK (1)	— (1)			
		P1402	OK (1)	OK (2)	— (2)	— (2)			
		SRT of EGR	"INCMP"	"INCMP"	"CMPLT"	"CMPLT"			
NG exists	Case 3	P0400	OK	OK	_	_			
		P0402	_	_	_	_			
		P1402	NG	_	NG	NG (Consecutive NG)			
		(1st trip) DTC	1st trip DTC	_	1st trip DTC	DTC (= MIL ON)			
		SRT of EGR	"INCMP"	"INCMP"	"INCMP"	"CMPLT"			

OK: Self-diagnosis is carried out and the result is OK.

NG: Self-diagnosis is carried out and the result is NG.

^{—:} Self-diagnosis is not carried out.

< SYSTEM DESCRIPTION > [VQ35HR]

When all SRT related self-diagnoses show OK results in a single cycle (Ignition OFF-ON-OFF), the SRT will indicate "CMPLT". \rightarrow Case 1 above

When all SRT related self-diagnoses show OK results through several different cycles, the SRT will indicate "CMPLT" at the time the respective self-diagnoses have at least one OK result. \rightarrow Case 2 above

If one or more SRT related self-diagnoses show NG results in 2 consecutive cycles, the SRT will also indicate "CMPLT". \rightarrow Case 3 above

The table above shows that the minimum number of cycles for setting SRT as "INCMP" is the number one (1) for each self-diagnosis (Case 1 & 2) or the number two (2) for one of self-diagnoses (Case 3). However, in preparation for the state emissions inspection, it is unnecessary for each self-diagnosis to be executed twice (Case 3) for the following reasons:

- The SRT will indicate "CMPLT" at the time the respective self-diagnoses have one (1) OK result.
- The emissions inspection requires "CMPLT" of the SRT only with OK self-diagnosis results.
- During SRT driving pattern, the 1st trip DTC (NG) is detected prior to "CMPLT" of SRT and the self-diagnosis memory must be erased from the ECM after repair.
- If the 1st trip DTC is erased, all the SRT will indicate "INCMP".

NOTE:

SRT can be set as "CMPLT" together with the DTC(s). Therefore, DTC check must always be carried out prior to the state emission inspection even though the SRT indicates "CMPLT".

SRT Service Procedure

If a vehicle has failed the state emissions inspection due to one or more SRT items indicating "INCMP", review the flowchart diagnostic sequence on the next figure.

EC

Α

С

D

Е

F

G

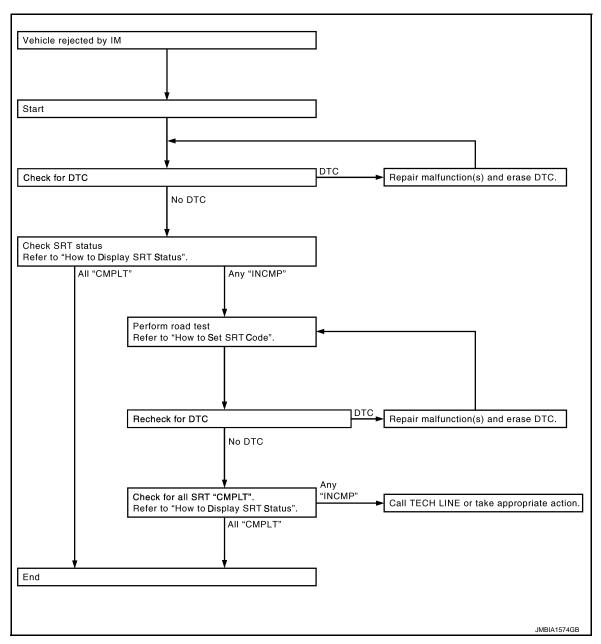
Н

K

L

IVI

Ν



How to Display SRT Status

WITH CONSULT-III

Selecting "SRT STATUS" in "DTC CONFIRMATION" mode with CONSULT-III.

For items whose SRT codes are set, "CMPLT" is displayed on the CONSULT-III screen; for items whose SRT codes are not set, "INCMP" is displayed.

NOTE:

Though displayed on the CONSULT-III screen, "HO2S HTR" is not SRT item.

WITH GST

Selecting Service \$01 with GST (Generic Scan Tool)

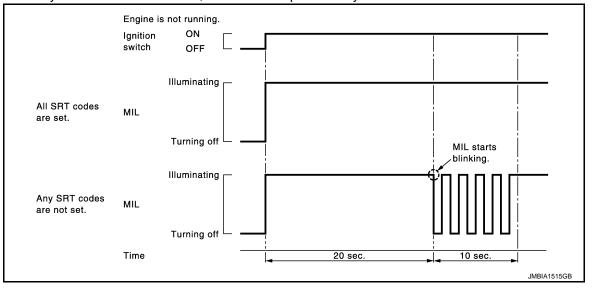
NO TOOLS

A SRT code itself cannot be displayed, however SRT status can.

- 1. Turn ignition switch ON and wait 20 seconds.
- SRT status is indicated as shown below.
 - When all SRT codes are set, MIL illuminates continuously.

[VQ35HR] < SYSTEM DESCRIPTION >

When any SRT codes are not set, MIL will blink periodically for 10 seconds.



MALFUNCTION INDICATOR LAMP (MIL)

Description

The MIL is located on the combination meter.

- The MIL will illuminate when the ignition switch is turned ON without the engine running. This is a bulb check. If the MIL does not illuminate, check MIL circuit. Refer to EC-488, "Component Function Check".
- When the engine is started, the MIL should turn off. If the MIL remains on, the on board diagnostic system has detected an engine system malfunction.



On Board Diagnostic System Function

The on board diagnostic system has the following three functions.

Α

EC

D

Е

F

Н

K

M

L

Ν

[VQ35HR]

Diagnostic Test Mode	KEY and ENG. Status	Function	Explanation of Function
Mode I	Ignition switch in ON position Engine stopped	BULB CHECK	This function checks the MIL bulb for damage (blown, open circuit, etc.). If the MIL does not come on, check MIL circuit.
	Engine running	MALFUNCTION WARNING	When a malfunction is detected twice in two consecutive driving cycles (two trip detection logic), the MIL will illuminated to inform the driver that a malfunction has been detected. The following malfunctions will illuminated or blink the MIL in the 1st trip. • Misfire (Possible three way catalyst damage) • One trip detection diagnoses
Mode II	Ignition switch in ON position Engine stopped	SELF-DIAGNOSTIC RESULTS	This function allows DTCs and 1st trip DTCs to be read.

Diagnostic Test Mode I — Bulb Check

In this mode, the MIL on the instrument panel should stay ON. If it remains OFF, check MIL circuit. Refer to <u>EC-488</u>, "Component Function Check".

Diagnostic Test Mode I — Malfunction Warning

MIL	Condition				
ON	When the malfunction is detected.				
OFF	No malfunction.				

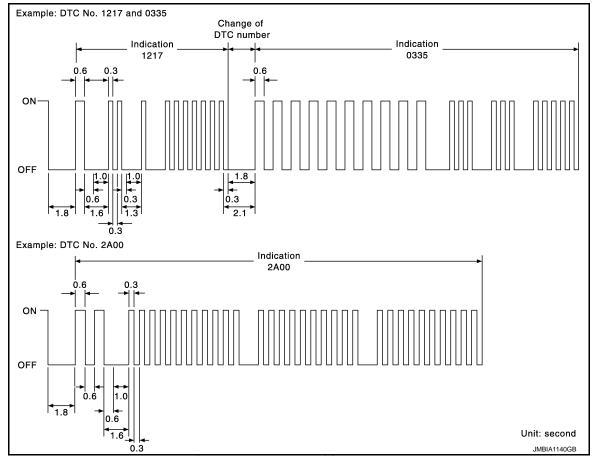
This DTC number is clarified in Diagnostic Test Mode II (SELF-DIAGNOSTIC RESULTS)

Diagnostic Test Mode II — Self-diagnostic Results

In this mode, the DTC and 1st trip DTC are indicated by the number of blinks of the MIL as shown below. The DTC and 1st trip DTC are displayed at the same time. If the MIL does not illuminate in diagnostic test mode I (Malfunction warning), all displayed items are 1st trip DTCs. If only one code is displayed when the MIL illuminates in diagnostic test mode II (SELF-DIAGNOSTIC RESULTS), it is a DTC; if two or more codes are displayed, they may be either DTCs or 1st trip DTCs. DTC No. is same as that of 1st trip DTC. These uniden-

[VQ35HR] < SYSTEM DESCRIPTION >

tified codes can be identified by using the CONSULT-III or GST. A DTC will be used as an example for how to read a code.



A particular trouble code can be identified by the number of four-digit numeral blinks as per the following.

Number	0	1	2	3	4	5	6	7	8	9	Α	В	С	D	Е	F
Blinks	10	1	2	3	4	5	6	7	8	9	11	12	13	14	15	16

The length of time the 1,000th-digit numeral blinks on and off is 1.2 seconds consisting of an ON (0.6-second) - OFF (0.6-second) cycle.

The 100th-digit numeral and lower digit numerals consist of a 0.3-seconds ON and 0.3-seconds OFF cycle.

A change from one digit numeral to another occurs at an interval of 1.0-second OFF. In other words, the later numeral appears on the display 1.3 seconds after the former numeral has disappeared.

A change from one trouble code to another occurs at an interval of 1.8-seconds OFF.

In this way, all the detected malfunctions are classified by their DTC numbers. The DTC 0000 refers to no malfunction. (See EC-542, "DTC Index")

How to Switch Diagnostic Test Mode

NOTE:

- It is better to count the time accurately with a clock.
- It is impossible to switch the diagnostic mode when an accelerator pedal position sensor circuit has a malfunction.
- ECM always returns to Diagnostic Test Mode I after the ignition switch is turned OFF.

HOW TO SET DIAGNOSTIC TEST MODE II (SELF-DIAGNOSTIC RESULTS)

- Confirm that accelerator pedal is fully released, turn ignition switch ON and wait 3 seconds.
- Repeat the following procedure quickly 5 times within 5 seconds.
- Fully depress the accelerator pedal.
- Fully release the accelerator pedal.
- Wait 7 seconds, fully depress the accelerator pedal and keep it depressed for approx. 10 seconds until the MIL starts blinking.

NOTE:

Do not release the accelerator pedal for 10 seconds if MIL starts blinking during this period. This blinking is displaying SRT status and is continued for another 10 seconds.

EC-119 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

F

Н

Ν

[VQ35HR1

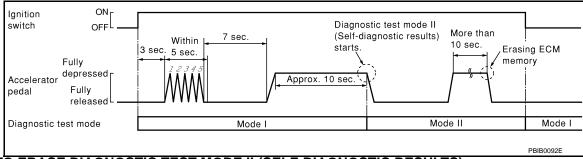
< SYSTEM DESCRIPTION >

4. Fully release the accelerator pedal.

ECM has entered to Diagnostic Test Mode II (Self-diagnostic results).

NOTE:

Wait until the same DTC (or 1st trip DTC) appears to completely confirm all DTCs.



HOW TO ERASE DIAGNOSTIC TEST MODE II (SELF-DIAGNOSTIC RESULTS)

- Set ECM in Diagnostic Test Mode II (Self-diagnostic results). Refer to "How to Set Diagnostic Test Mode II (Self-diagnostic Results)".
- Fully depress the accelerator pedal and keep it depressed for more than 10 seconds.The emission-related diagnostic information has been erased from the backup memory in the ECM.
- 3. Fully release the accelerator pedal, and confirm the DTC 0000 is displayed.
- If the battery is disconnected, the DTC will be lost from the backup memory within 24 hours.
- Do not erase the stored memory before starting trouble diagnoses.

OBD System Operation Chart

Relationship Between MIL, 1st Trip DTC, DTC, and Detectable Items

- When a malfunction is detected for the first time, the 1st trip DTC and the 1st trip freeze frame data are stored in the ECM memory.
- When the same malfunction is detected in two consecutive trips, the DTC and the freeze frame data are stored in the ECM memory, and the MIL will come on.
- The MIL will turn off after the vehicle is driven 3 times (driving pattern B) with no malfunction. A drive is counted only when the recorded driving pattern is met (as stored in the ECM). If another malfunction occurs while counting, the counter will reset.
- The DTC and the freeze frame data will be stored until the vehicle is driven 40 times (driving pattern A) without the same malfunction recurring (except for Misfire and Fuel Injection System). For Misfire and Fuel Injection System, the DTC and freeze frame data will be stored until the vehicle is driven 80 times (driving pattern C) without the same malfunction recurring. The "TIME" in "SELF-DIAGNOSTIC RESULTS" mode of CONSULT-III will count the number of times the vehicle is driven.
- The 1st trip DTC is not displayed when the self-diagnosis results in OK for the 2nd trip.

Summary Chart

Items	Fuel Injection System	Misfire	Other		
MIL (turns off)	3 (pattern B)	3 (pattern B)	3 (pattern B)		
DTC, Freeze Frame Data (no display)	80 (pattern C)	80 (pattern C)	40 (pattern A)		
1st Trip DTC (clear)	1 (pattern C), *1	1 (pattern C), *1	1 (pattern B)		
1st Trip Freeze Frame Data (clear)	*1, *2	*1, *2	1 (pattern B)		

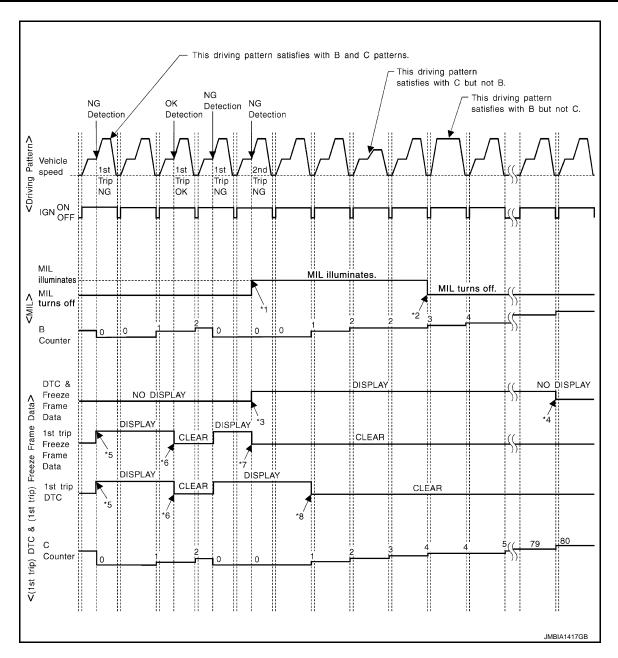
For details about patterns B and C under "Fuel Injection System" and "Misfire", see "EXPLANATION FOR DRIVING PATTERNS FOR "MISFIRE <EXHAUST QUALITY DETERIORATION>", "FUEL INJECTION SYSTEM".

For details about patterns A and B under Other, see "EXPLANATION FOR DRIVING PATTERNS FOR "MISFIRE <EXHAUST QUALITY DETERIORATION>", "FUEL INJECTION SYSTEM".

Relationship Between MIL, DTC, 1st Trip DTC and Driving Patterns for "Misfire <Exhaust Quality Deterioration>", "Fuel Injection System"

^{*1:} Clear timing is at the moment OK is detected.

^{*2:} Clear timing is when the same malfunction is detected in the 2nd trip.



- *1: When the same malfunction is detected in two consecutive trips, MIL will illuminate.
- *4: The DTC and the freeze frame data will not be displayed any longer after vehicle is driven 80 times (pattern C) without the same malfunction. (The DTC and the freeze frame data still remain in ECM.)
- *7: When the same malfunction is detected in the 2nd trip, the 1st trip freeze frame data will be cleared.

- *2: MIL will turn off after vehicle is driven 3 times (pattern B) without any malfunctions.
- *5: When a malfunction is detected for the first time, the 1st trip DTC and the 1st trip freeze frame data will be stored in ECM.
- *8: 1st trip DTC will be cleared when vehicle is driven once (pattern C) without the same malfunction after DTC is stored in ECM.
- *3: When the same malfunction is detected in two consecutive trips, the DTC and the freeze frame data will be stored in ECM.
- *6: The 1st trip DTC and the 1st trip freeze frame data will be cleared at the moment OK is detected.

Explanation for Driving Patterns for "Misfire <Exhaust Quality Deterioration>", "Fuel Injection System" <Driving Pattern B>

Driving pattern B means the vehicle operation as per the following:

All components and systems should be monitored at least once by the OBD system.

EC-121 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

M

Ν

< SYSTEM DESCRIPTION > [VQ35HR]

- The B counter will be cleared when the malfunction is detected once regardless of the driving pattern.
- The B counter will be counted up when driving pattern B is satisfied without any malfunction.
- The MIL will turn off when the B counter reaches 3. (*2 in "OBD SYSTEM OPERATION CHART")

<Driving Pattern C>

Driving pattern C means operating vehicle as per the following:

The following conditions should be satisfied at the same time:

Engine speed: (Engine speed in the freeze frame data) ±375 rpm

Calculated load value: (Calculated load value in the freeze frame data) x (1±0.1) [%]

Engine coolant temperature (T) condition:

- When the freeze frame data shows lower than 70°C (158°F), T should be lower than 70°C (158°F).
- When the freeze frame data shows higher than or equal to 70°C (158°F), T should be higher than or equal to 70°C (158°F).

Example:

If the stored freeze frame data is as per the following:

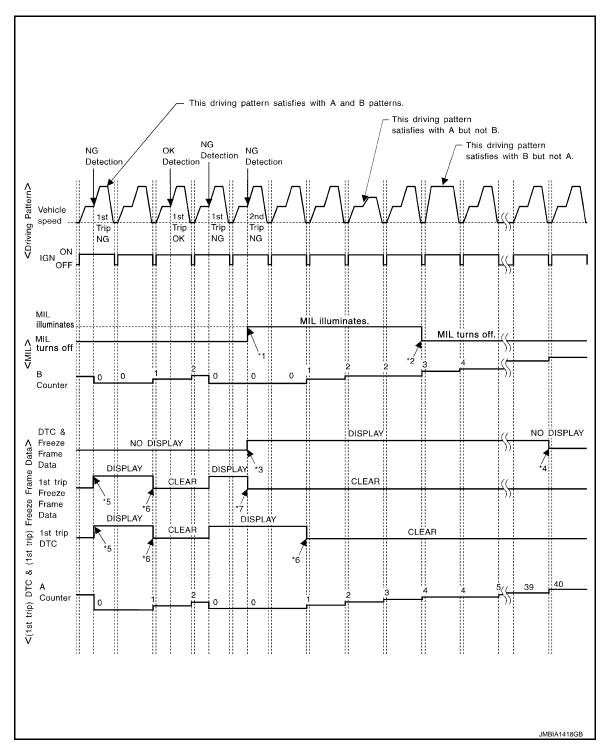
Engine speed: 850 rpm, Calculated load value: 30%, Engine coolant temperature: 80°C (176°F)

To be satisfied with driving pattern C, the vehicle should run under the following conditions:

Engine speed: 475 - 1,225 rpm, Calculated load value: 27 - 33%, Engine coolant temperature: more than 70°C (158°F)

- The C counter will be cleared when the malfunction is detected regardless of vehicle conditions above.
- The C counter will be counted up when vehicle conditions above are satisfied without the same malfunction.
- The DTC will not be displayed after C counter reaches 80.
- The 1st trip DTC will be cleared when C counter is counted once without the same malfunction after DTC is stored in ECM.

Relationship Between MIL, DTC, 1st Trip DTC and Driving Patterns Except For "Misfire <Exhaust Quality Deterioration>", "Fuel Injection System"



- *1: When the same malfunction is detected in two consecutive trips, MIL will illuminate.
- *2: MIL will turn off after vehicle is driven 3 times (pattern B) without any malfunctions.
 - *3: When the same malfunction is detected in two consecutive trips, the DTC and the freeze frame data will be stored in ECM.

Α

EC

С

D

Е

F

G

Н

1

K

.

M

Ν

0

< SYSTEM DESCRIPTION >

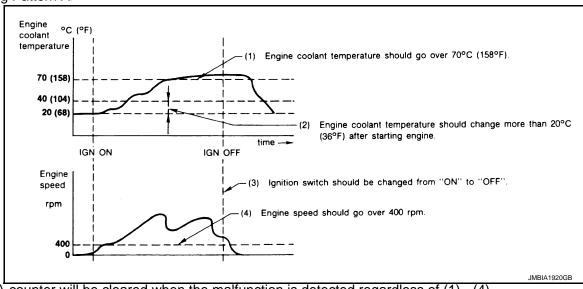
*4: The DTC and the freeze frame data will not be displayed any longer after vehicle is driven 40 times (pattern A) without the same malfunction. (The DTC and the freeze frame data still remain in ECM.)

tected in the 2nd trip, the 1st trip freeze frame data will be cleared.

- still remain in ECM.)

 *7: When the same malfunction is de-
- *5: When a malfunction is detected for the first time, the 1st trip DTC and the 1st trip freeze frame data will be stored in ECM.
- *6: 1st trip DTC will be cleared after vehicle is driven once (pattern B) without the same malfunction.

Explanation for Driving Patterns Except for "Misfire <Exhaust Quality Deterioration>", "Fuel Injection System" <Driving Pattern A>



- The A counter will be cleared when the malfunction is detected regardless of (1) (4).
- The A counter will be counted up when (1) (4) are satisfied without the same malfunction.
- The DTC will not be displayed after the A counter reaches 40.

<Driving Pattern B>

Driving pattern B means operating vehicle as per following:

All components and systems should be monitored at least once by the OBD system.

- The B counter will be cleared when the malfunction is detected once regardless of the driving pattern.
- The B counter will be counted up when driving pattern B is satisfied without any malfunctions.
- The MIL will turn off when the B counter reaches 3 (*2 in OBD SYSTEM OPERATION CHART).

CONSULT-III Function

INFOID:0000000003856035

FUNCTION

Diagnostic test mode	Function
Work support	This mode enables a technician to adjust some devices faster and more accurately by following the indications on the CONSULT-III unit.
Self-diagnostic results	Self-diagnostic results such as 1st trip DTC, DTCs and 1st trip freeze frame data or freeze frame data can be read and erased quickly.*
Data monitor	Input/Output data in the ECM can be read.
Active test	Diagnostic Test Mode in which CONSULT-III drives some actuators apart from the ECMs and also shifts some parameters in a specified range.
DTC & SRT confirmation	The status of system monitoring tests and the self-diagnosis status/results can be confirmed.
Function test	This mode is used to inform customers when the vehicle requires periodic maintenance.
ECU part number	ECM part number can be read.

- *: The following emission-related diagnostic information is cleared when the ECM memory is erased.
- · Diagnostic trouble codes
- · 1st trip diagnostic trouble codes
- · Freeze frame data

< SYSTEM DESCRIPTION >

[VQ35HR]

- 1st trip freeze frame data
- · System readiness test (SRT) codes

Item

Test values

ENGINE CONTROL COMPONENT PARTS

INPUT

Knock sensor

Stop lamp switch

Battery voltage

Fuel level sensor Battery current sensor

ICC steering switch

ICC brake switch

ASCD brake switch

Snow mode switch

ASCD steering switch

Load signal

sensor

ENGINE CONTROL COMPONENT PARTS/CONTROL SYSTEMS APPLICATION

DIAGNOSTIC TEST MODE SELF-DIAGNOSTIC DTC & SRT RESULTS CONFIRMATION DATA WORK **ACTIVE** DTC MONI-**FREEZE** SUPPORT **TEST SRT STA-WORK** TOR DTC*1 **FRAME** TUS SUP-D DATA*2 **PORT** Crankshaft position sensor × × × Е Camshaft position sensor × × \times Mass air flow sensor × × Engine coolant temperature sensor × X X X Engine oil temperature sensor × × Air fuel ratio (A/F) sensor 1 × × × Heated oxygen sensor 2 × × Vehicle speed signal Accelerator pedal position sensor X Throttle position sensor × X X Fuel tank temperature sensor X X EVAP control system pressure sensor × × Intake air temperature sensor × × × × Refrigerant pressure sensor \times Air conditioner switch × Park/neutral position (PNP) signal × \times × \times Power steering pressure sensor × × × × Exhaust valve timing control position M ×

×

×

×

×

×

EC-125 Revision: 2009 March 2009 FX35/FX50

×

×

×

×

×

EC

Α

Ν

			DIAGNOSTIC TEST MODE						
	Item		SELF-DIAGNOSTIC RESULTS		DATA		DTC & SRT CONFIRMATION		
			WORK SUPPORT	DTC*1	FREEZE FRAME DATA*2	DATA MONI- TOR	ACTIVE TEST	SRT STA- TUS	DTC WORK SUP- PORT
		Fuel injector				×	×		
		Power transistor (Ignition timing)				×	×		
		Throttle control motor relay		×		×			
Z		Throttle control motor		×					
T PAR	оитрит	EVAP canister purge volume control solenoid valve		×		×	×		×
Ä		Air conditioner relay				×			
<u>6</u>		Fuel pump relay	×			×	×		
Ö		Cooling fan relay		×		×	×		
OL (5	Air fuel ratio (A/F) sensor 1 heater		×		×		×* ³	
MTR		Heated oxygen sensor 2 heater		×		×		×* ³	
8		EVAP canister vent control valve	×	×		×	×		
ENGINE CONTROL COMPONENT PARTS		Intake valve timing control solenoid valve		×		×	×		
Ш		Alternator				×	×		
		Exhaust valve timing control magnet retarder	×	×		×	×		
		Calculated load value			×	×			

^{×:} Applicable

WORK SUPPORT MODE

Work Item

WORK ITEM	CONDITION	USAGE
FUEL PRESSURE RELEASE	Fuel pump will stop by touching "START" during idling. Crank a few times after engine stalls.	When releasing fuel pressure from fuel line
IDLE AIR VOL LEARN	The idle air volume that keeps the engine within the specified range is memorized in ECM.	When learning the idle air volume
SELF-LEARNING CONT	The coefficient of self-learning control mixture ration returns to the original coefficient.	When clearing mixture ratio self- learning value

^{*1:} This item includes 1st trip DTCs.

^{*2:} This mode includes 1st trip freeze frame data or freeze frame data. The items appear on CONSULT-III screen in freeze frame data mode only if a 1st trip DTC or DTC is detected. For details, refer to EC-111, "Diagnosis Description".

^{*3:} Always "CMPLT" is displayed.

< SYSTEM DESCRIPTION >

[VQ35HR]

Α

EC

D

Е

F

G

Н

K

L

M

Ν

Р

WORK ITEM	CONDITION	USAGE
EVAP SYSTEM CLOSE	Close the EVAP canister vent control valve in order to make EVAP system close under the following conditions. Ignition switch ON Engine not running Ambient temperature is above 0°C (32°F). No vacuum and no high pressure in EVAP system Fuel tank temperature. Is more than 0°C (32°F). Within 10 minutes after starting "EVAP SYSTEM CLOSE" When trying to execute "EVAP SYSTEM CLOSE" under the condition except above, CONSULT-III will discontinue it and display appropriate instruction. NOTE: When starting engine, CONSULT-III may display "BATTERY VOLTAGE IS LOW. CHARGE BATTERY", even when using a charged battery.	When detecting EVAP vapor leak in the EVAP system
VIN REGISTRATION	In this mode, VIN is registered in ECM.	When registering VIN in ECM
EXH V/T CONTROL LEARN	In this mode, operation to learn exhaust valve timing control magnet retarder characteristic.	When learning the exhaust valve timing control
TARGET IDLE RPM ADJ*	Idle condition	When setting target idle speed
TARGET IGN TIM ADJ*	Idle condition	When adjusting target ignition timing

^{*:} This function is not necessary in the usual service procedure.

SELF-DIAG RESULTS MODE

Self Diagnostic Item

Regarding items of DTC and 1st trip DTC, refer to EC-542. "DTC Index".

Freeze Frame Data and 1st Trip Freeze Frame Data

Freeze frame data item*	Description	
DTC	The engine control component part/control system has a trouble code that is displayed as DTC. (Refer to EC-542. "DTC_Index".)	
FUEL SYS-B1	"Fuel injection system status" at the moment a malfunction is detected is displayed.	
FUEL SYS-B2	One of the following mode is displayed. Mode2: Open loop due to detected system malfunction Mode3: Open loop due to driving conditions (power enrichment, deceleration enleanment) Mode4: Closed loop - using oxygen sensor(s) as feedback for fuel control Mode5: Open loop - has not yet satisfied condition to go to closed loop	
CAL/LD VALUE [%]	The calculated load value at the moment a malfunction is detected is displayed.	
COOLANT TEMP [°C] or [°F]	The engine coolant temperature at the moment a malfunction is detected is displayed.	
L-FUEL TRM-B1 [%]	"Long-term fuel trim" at the moment a malfunction is detected is displayed.	
L-FUEL TRM-B2 [%]	The long-term fuel trim indicates much more gradual feedback compensation to the base fuel schedule than short-term fuel trim.	
S-FUEL TRM-B1 [%]	"Short-term fuel trim" at the moment a malfunction is detected is displayed.	
S-FUEL TRM-B2 [%]	 The short-term fuel trim indicates dynamic or instantaneous feedback compensation to the base fuel sched- ule. 	
ENGINE SPEED [rpm]	The engine speed at the moment a malfunction is detected is displayed.	
VEHICL SPEED [km/h] or [mph]	The vehicle speed at the moment a malfunction is detected is displayed.	
ABSOL TH-P/S [%]	The throttle valve opening angle at the moment a malfunction is detected is displayed.	
B/FUEL SCHDL [msec]	The base fuel schedule at the moment a malfunction is detected is displayed.	
INT/A TEMP SE [°C] or [°F]	The intake air temperature at the moment a malfunction is detected is displayed.	

< SYSTEM DESCRIPTION >

Freeze frame data item*	Description
INT MANI PRES [kPa]	
COMBUST CONDI- TION	These items are displayed but are not applicable to this model.

^{*:} The items are the same as those of 1st trip freeze frame data.

DATA MONITOR MODE

Monitored Item

Monitored item	Unit	Description	Remarks
ENG SPEED	Indicates the engine speed computed from the signal of the crankshaft position sensor and carr shaft position sensor. Indicates the engine speed computed from the signal of the crankshaft position sensor.		 Accuracy becomes poor if engine speed drops below the idle rpm. If the signal is interrupted while the engine is running, an abnormal value may be indicated.
MAS A/F SE-B1			When the engine is stopped, a certain
MAS A/F SE-B2	V	The signal voltage of the mass air flow sensor is displayed.	value is indicated.When engine is running, specification range is indicated in "SPEC".
B/FUEL SCHDL	msec	"Base fuel schedule" indicates the fuel injection pulse width programmed into ECM, prior to any learned on board correction.	When engine is running, specification range is indicated in "SPEC".
A/F ALPHA-B1			When the engine is stopped, a certain
A/F ALPHA-B2	%	The mean value of the air-fuel ratio feedback cor- rection factor per cycle is indicated.	 value is indicated. This data also includes the data for the air-fuel ratio learning control. When engine is running, specification range is indicated in "SPEC".
COOLAN TEMP/S	°C or °F	The engine coolant temperature (determined by the signal voltage of the engine coolant tempera- ture sensor) is displayed.	When the engine coolant temperature sensor is open or short-circuited, ECM enters fail-safe mode. The en- gine coolant temperature determined by the ECM is displayed.
A/F SEN1 (B1)	V	The A/F signal computed from the input signal of	
A/F SEN1 (B2)	V	the air fuel ratio (A/F) sensor 1 is displayed.	
HO2S2 (B1)	V	The signal voltage of the heated oxygen sensor 2	
HO2S2 (B2)		is displayed.	
HO2S2 MNTR (B1)		Display of heated oxygen sensor 2 signal:	
HO2S2 MNTR (B2)	RICH/LEAN	RICH: means the amount of oxygen after three way catalyst is relatively small. LEAN: means the amount of oxygen after three way catalyst is relatively large.	When the engine is stopped, a certain value is indicated.
VHCL SPEED SE	km/h or mph	The vehicle speed computed from the vehicle speed signal sent from unifed meter and A/C amp. is displayed.	
BATTERY VOLT	V	The power supply voltage of ECM is displayed.	
ACCEL SEN 1	.,	The accelerator pedal position sensor signal volt-	ACCEL SEN 2 signal is converted by
ACCEL SEN 2	V		ECM internally. Thus, they differs from ECM terminal voltage signal.
TP SEN 1-B1		The throttle position sensor signal voltage is dis-	TP SEN 2-B1 signal is converted by
TP SEN 2-B1	V	played.	ECM internally. Thus, they differs from ECM terminal voltage signal.
FUEL T/TMP SE	°C or °F	The fuel temperature (determined by the signal voltage of the fuel tank temperature sensor) is displayed.	

< SYSTEM DESCRIPTION >

[VQ35HR]

Monitored item	Unit	Description	Remarks
INT/A TEMP SE °C or °F		The intake air temperature (determined by the signal voltage of the intake air temperature sensor) is indicated.	
EVAP SYS PRES	V	The signal voltage of EVAP control system pressure sensor is displayed.	
FUEL LEVEL SE	V	The signal voltage of the fuel level sensor is displayed.	
START SIGNAL	ON/OFF	Indicates start signal status [ON/OFF] computed by the ECM according to the signals of engine speed and battery voltage.	 After starting the engine, [OFF] is dis- played regardless of the starter sig- nal.
CLSD THL POS	ON/OFF	Indicates idle position [ON/OFF] computed by ECM according to the accelerator pedal position sensor signal.	
AIR COND SIG	ON/OFF	Indicates [ON/OFF] condition of the air conditioner switch as determined by the air conditioner signal.	
P/N POSI SW	ON/OFF	Indicates [ON/OFF] condition from the park/neutral position (PNP) signal.	
PW/ST SIGNAL	ON/OFF	[ON/OFF] condition of the power steering system (determined by the signal voltage of the power steering pressure sensor signal) is indicated.	
LOAD SIGNAL	ON/OFF	Indicates [ON/OFF] condition from the electrical load signal. ON: Rear window defogger switch is ON and/or lighting switch is in 2nd position. OFF: Both rear window defogger switch and lighting switch are OFF.	
IGNITION SW	ON/OFF	Indicates [ON/OFF] condition from ignition switch signal.	
HEATER FAN SW	ON/OFF	Indicates [ON/OFF] condition from the heater fan switch signal.	
BRAKE SW	ON/OFF	Indicates [ON/OFF] condition from the stop lamp switch signal.	
INJ PULSE-B1 INJ PULSE-B2	msec	Indicates the actual fuel injection pulse width compensated by ECM according to the input sig- nals.	When the engine is stopped, a certain computed value is indicated.
IGN TIMING	BTDC	Indicates the ignition timing computed by ECM according to the input signals.	When the engine is stopped, a certain value is indicated.
CAL/LD VALUE	%	"Calculated load value" indicates the value of the current air flow divided by peak air flow.	
MASS AIRFLOW	g-m/s	Indicates the mass air flow computed by ECM according to the signal voltage of the mass air flow sensor.	
PURG VOL C/V	%	 Indicates the EVAP canister purge volume control solenoid valve control value computed by the ECM according to the input signals. The opening becomes larger as the value increases. 	
INT/V TIM (B1) INT/V TIM (B2)	°CA	Indicates [°CA] of intake camshaft advance angle.	
EXH/V TIM B1 EXH/V TIM B2	°CA	Indicates [°CA] of exhaust camshaft retard angle.	

< SYSTEM DESCRIPTION >

[VQ35HR]

Monitored item	Unit	Description	Remarks
INT/V SOL (B1) INT/V SOL (B2)	%	 The control value of the intake valve timing control solenoid valve (determined by ECM according to the input signals) is indicated. The advance angle becomes larger as the value increases. 	
VTC DTY EX B1 VTC DTY EX B2	%	 The control value of the exhaust valve timing control magnet retarder (determined by ECM according to the input signals) is indicated. The retard angle becomes larger as the value increases. 	
TP SEN 1-B2		The throttle position sensor signal voltage is dis-	TP SEN 2-B2 signal is converted by
TP SEN 2-B2	V	played.	ECM internally. Thus, they differs from ECM terminal voltage signal.
AIR COND RLY	ON/OFF	The air conditioner relay control condition (determined by ECM according to the input signals) is indicated.	
FUEL PUMP RLY	ON/OFF	Indicates the fuel pump relay control condition determined by ECM according to the input signals.	
VENT CONT/V	ON/OFF	The control condition of the EVAP canister vent control valve (determined by ECM according to the input signals) is indicated. ON: Closed OFF: Open	
THRTL RELAY	ON/OFF	Indicates the throttle control motor relay control condition determined by the ECM according to the input signals.	
HO2S2 HTR (B1)		Indicates [ON/OFF] condition of heated oxygen	
HO2S2 HTR (B2)	ON/OFF	sensor 2 heater determined by ECM according to the input signals.	
I/P PULLY SPD	rpm	Indicates the engine speed computed from the Input speed sensor signal.	
VEHICLE SPEED	km/h or mph	The vehicle speed computed from the vehicle speed signal sent from TCM is displayed.	
IDL A/V LEARN	YET/CMPLT	Displays the condition of Idle Air Volume Learning YET: Idle air volume learning has not been performed yet. CMPLT: Idle air volume learning has already been performed successfully.	
SNOW MODE SW	ON/OFF	Indicates [ON/OFF] condition from the snow mode switch signal.	
ENG OIL TEMP	°C or °F	The engine oil temperature (determined by the signal voltage of the engine oil temperature sen- sor) is displayed.	
TRVL AFTER MIL	km or mile	Distance traveled while MIL is activated.	
A/F S1 HTR (B1) A/F S1 HTR (B2)	%	 Air fuel ratio (A/F) sensor 1 heater control value computed by ECM according to the input signals. The current flow to the heater becomes larger as the value increases. 	
AC PRESS SEN	V	The signal voltage from the refrigerant pressure sensor is displayed.	
VHCL SPEED SE	km/h or mph	The vehicle speed computed from the vehicle speed signal sent from unifed meter and A/C amp. is displayed.	
SET VHCL SPD	km/h or mph	The preset vehicle speed is displayed.	

< SYSTEM DESCRIPTION >

[VQ35HR]

Monitored item	Unit	Description	Remarks
MAIN SW	ON/OFF	Indicates [ON/OFF] condition from MAIN switch signal.	
CANCEL SW	ON/OFF	Indicates [ON/OFF] condition from CANCEL switch signal.	
RESUME/ACC SW	ON/OFF	Indicates [ON/OFF] condition from RESUME/AC- CELERATE switch signal.	•
SET SW	ON/OFF	Indicates [ON/OFF] condition from SET/COAST switch signal.	
BRAKE SW1	ON/OFF	Indicates [ON/OFF] condition from ASCD brake switch signal.	
BRAKE SW2	ON/OFF	Indicates [ON/OFF] condition of stop lamp switch signal.	
DIST SW	ON/OFF	Indicates [ON/OFF] condition from DISTANCE switch signal.	
VHCL SPD CUT	NON/CUT	Indicates the vehicle cruise condition. NON: Vehicle speed is maintained at the ASCD set speed. CUT: Vehicle speed decreased to excessively low compared with the ASCD set speed, and ASCD operation is cut off.	
LO SPEED CUT	NON/CUT	Indicates the vehicle cruise condition. NON: Vehicle speed is maintained at the ASCD set speed. CUT: Vehicle speed decreased to excessively low, and ASCD operation is cut off.	
AT OD MONITOR	ON/OFF	Indicates [ON/OFF] condition of A/T O/D according to the input signal from the TCM.	
AT OD CANCEL	ON/OFF	Indicates [ON/OFF] condition of A/T O/D cancel request signal.	
CRUISE LAMP	ON/OFF	Indicates [ON/OFF] condition of CRUISE indicator determined by the ECM according to the input signals.	
SET LAMP	ON/OFF	Indicates [ON/OFF] condition of SET indicator determined by the ECM according to the input signals.	
EXH V/T LEARN	YET/CMPLT	Display the condition of Exhaust Valve Timing Control Learning YET: Exhaust Valve Timing Control Learning has not been performed yet. CMPLT: Exhaust Valve Timing Control Learning has already been performed successfully.	
BAT CUR SEN	mV	The signal voltage of battery current sensor is displayed.	
ALT DUTY SIG	ON/OFF	The control condition of the power generation voltage variable control (determined by ECM according to the input signals) is indicated. ON: Power generation voltage variable control is active. OFF: Power generation voltage variable control is inactive.	
A/F ADJ-B1		Indicates the correction of factor stored in ECM.	
A/F ADJ-B2	_	The factor is calculated from the difference be- tween the target air-fuel ratio stored in ECM and the air-fuel ratio calculated from A/F sensor 1 sig- nal.	

< SYSTEM DESCRIPTION >

[VQ35HR]

Monitored item	Unit	Description	Remarks
FAN DUTY	%	Indicates a command value for cooling fan. The value is calculated by ECM based on input signals.	
AC EVA TEMP	°C or °F	Indicates A/C evaporator temperature sent from "unified meter and A/C amp.".	
AC EVA TARGET	°C or °F	Indicates target A/C evaporator temperature sent from "unified meter and A/C amp.".	
ALT DUTY	%	Indicates the duty ratio of the power generation command value. The ratio is calculated by ECM based on the battery current sensor signal.	

NOTE:

Any monitored item that does not match the vehicle being diagnosed is deleted from the display automatically.

ACTIVE TEST MODE

Test Item

TEST ITEM	CONDITION	JUDGMENT	CHECK ITEM (REMEDY)
FUEL INJEC- TION	Engine: Return to the original non-standard condition Change the amount of fuel injection using CONSULT-III.	If malfunctioning symptom disappears, see CHECK ITEM.	Harness and connectors Fuel injector Air fuel ratio (A/F) sensor 1
IGNITION TIM- ING	Engine: Return to the original non-standard condition Timing light: Set Retard the ignition timing using CONSULT-III.	If malfunctioning symptom disappears, see CHECK ITEM.	Perform Idle Air Volume Learning.
POWER BAL- ANCE	 Engine: After warming up, idle the engine. A/C switch OFF Selector lever: P or N Cut off each injector signal one at a time using CONSULT-III. 	Engine runs rough or stops.	Harness and connectors Compression Fuel injector Power transistor Spark plug Ignition coil
ENG COOLANT TEMP	Engine: Return to the original non-standard condition Change the engine coolant temperature using CONSULT-III.	If malfunctioning symptom disappears, see CHECK ITEM.	Harness and connectors Engine coolant temperature sensor Fuel injector
FUEL PUMP RE- LAY	Ignition switch: ON (Engine stopped) Turn the fuel pump relay ON and OFF using CONSULT-III and listen to operating sound.	Fuel pump relay makes the operating sound.	Harness and connectors Fuel pump relay
PURG VOL CONT/V	Engine: After warming up, run engine at 1,500 rpm. Change the EVAP canister purge volume control solenoid valve opening percent using CONSULT-III.	Engine speed changes according to the opening percent.	Harness and connectors Solenoid valve
FUEL/T TEMP SEN	Change the fuel tank temperature	using CONSULT-III.	
VENT CON- TROL/V	Ignition switch: ON (Engine stopped) Turn solenoid valve ON and OFF with the CONSULT-III and listen to operating sound.	Solenoid valve makes an operating sound.	Harness and connectors Solenoid valve
INT V/T ASSIGN ANGLE	Engine: Return to the original non-standard condition Change intake valve timing using CONSULT-III.	If malfunctioning symptom disappears, see CHECK ITEM.	Harness and connectors Intake valve timing control solenoid valve

< SYSTEM DESCRIPTION >

[VQ35HR]

TEST ITEM	CONDITION	JUDGMENT	CHECK ITEM (REMEDY)
EXH V/T ASSIGN ANGLE	Engine: Return to the original non-standard condition Change exhaust valve timing using CONSULT-III.	If malfunctioning symptom disappears, see CHECK ITEM.	Harness and connectors Exhaust valve timing control magnet retarder
FAN DUTY CONTROL*	Ignition switch: ON Change duty ratio using CON- SULT-III.	Cooling fan speed changes.	Harness and connectors Cooling fan motor Cooling fan relay Cooling fan control module IPDM E/R
ALTERNATOR DUTY	Engine: Idle Change duty ratio using CON- SULT-III.	Battery voltage changes.	Harness and connectors IPDM E/R Alternator

^{*:} Leaving cooling fan OFF with CONSULT-III while engine is running may cause the engine to overheat.

DTC & SRT CONFIRMATION MODE

SRT STATUS Mode

For details, refer to EC-111, "Diagnosis Description".

SRT WORK SUPPORT Mode

This mode enables a technician to drive a vehicle to set the SRT while monitoring the SRT status.

DTC WORK SUPPORT Mode

Test mode	Test item	Corresponding DTC No.	Reference page
EVAPORATIVE SYSTEM	EVP SML LEAK P0442/P1442*	P0442	EC-291
	EVF SIVIL LEAR FU442/F1442	P0455	EC-328
	EVP V/S LEAK P0456/P1456*	P0456	EC-334
	PURG VOL CN/V P1444	P0443	EC-297
	PURG FLOW P0441	P0441	EC-286
A/F SEN1	A/F SEN1 (B1) P1278/P1279	P0133	EC-212
	A/F SEN1 (B1) P1276	P0130	EC-202
	A/F SEN1 (B2) P1288/P1289	P0153	EC-212
	A/F SEN1 (B2) P1286	P0150	EC-202
HO2S2	HO2S2 (B1) P1146	P0138	EC-223
	HO2S2 (B1) P1147	P0137	EC-217
	HO2S2 (B1) P0139	P0139	EC-231
	HO2S2 (B2) P1166	P0158	EC-223
	HO2S2 (B2) P1167	P0157	EC-217
	HO2S2 (B2) P0159	P0159	EC-231

^{*:} DTC P1442 and P1456 does not apply to S51 models but appears in DTC Work Support Mode screens.

Diagnosis Tool Function

DESCRIPTION

INFOID:0000000003856036

Revision: 2009 March **EC-133** 2009 FX35/FX50

EC

Α

D

Е

F

Н

|

J

L

M

N

0

Ρ

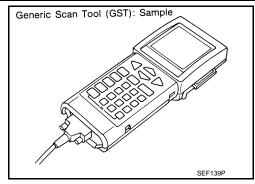
< SYSTEM DESCRIPTION >

[VQ35HR]

Generic Scan Tool (OBD II scan tool) complying with SAE J1978 has 8 different functions explained below.

ISO15765-4 is used as the protocol.

The name "GST" or "Generic Scan Tool" is used in this service manual.

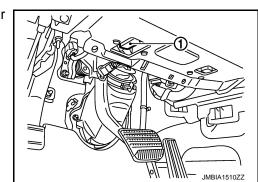


FUNCTION

Diagnostic Service		Function		
Service \$01	READINESS TESTS	This diagnostic service gains access to current emission-related data values, includi alog inputs and outputs, digital inputs and outputs, and system status information.		
Service \$02 (FREEZE DATA)		This diagnostic service gains access to emission-related data value that were stored by ECM during the freeze frame. For details, refer to EC-542 , "DTC Index".		
Service \$03 DTCs		This diagnostic service gains access to emission-related power train trouble codes which were stored by ECM.		
Service \$04	CLEAR DIAG INFO	This diagnostic service can clear all emission-related diagnostic information. This includes: Clear number of diagnostic trouble codes (Service \$01) Clear diagnostic trouble codes (Service \$03) Clear trouble code for freeze frame data (Service \$01) Clear freeze frame data (Service \$02) Reset status of system monitoring test (Service \$01) Clear on board monitoring test results (Service \$06 and \$07)		
Service \$06	(ON BOARD TESTS)	This diagnostic service accesses the results of on board diagnostic monitoring tests of specific components/systems that are not continuously monitored.		
Service \$07	(ON BOARD TESTS)	This diagnostic service enables the off board test drive to obtain test results for emission-related powertrain components/systems that are continuously monitored during normal driving conditions.		
Service \$08	_	This diagnostic service can close EVAP system in ignition switch ON position (Engine stopped). When this diagnostic service is performed, EVAP canister vent control valve can be closed. In the following conditions, this diagnostic service cannot function. Low ambient temperature Low battery voltage Engine running Ignition switch OFF Low fuel temperature Too much pressure is applied to EVAP system		
Service \$09	(CALIBRATION ID)	This diagnostic service enables the off-board test device to request specific vehicle information such as Vehicle Identification Number (VIN) and Calibration IDs.		

INSPECTION PROCEDURE

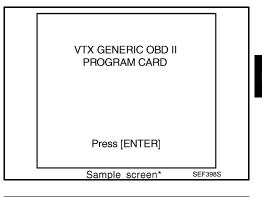
- 1. Turn ignition switch OFF.
- 2. Connect "GST" to data link connector (1), which is located under LH dash panel near the hood opener handle.



[VQ35HR] < SYSTEM DESCRIPTION >

- 3. Turn ignition switch ON.
- 4. Enter the program according to instruction on the screen or in the operation manual.

(*: Regarding GST screens in this section, sample screens are shown.)



5. Perform each diagnostic mode according to each service proce-

For further information, see the GST Operation Manual of the tool maker.

OBD II FUNCTIONS

F0: DATA LIST

F1: FREEZE DATA

F2: DTCs

F3: SNAPSHOT

F4: CLEAR DIAG INFO

F5: O2 TEST RESULTS

F7: ON BOARD TESTS

F9: UNIT CONVERSION

Sample screen*

F6: READINESS TESTS

F8: EXPAND DIAG PROT

EC-135 Revision: 2009 March 2009 FX35/FX50

Α

EC

D

Е

Н

K

L

Ν

0

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

DTC/CIRCUIT DIAGNOSIS

TROUBLE DIAGNOSIS - SPECIFICATION VALUE

Description INFOID:000000003856037

The specification (SP) value indicates the tolerance of the value that is displayed in "SPEC" in "DATA MONITOR" mode of CONSULT-III during normal operation of the Engine Control System. When the value in "SPEC" in "DATA MONITOR" mode is within the SP value, the Engine Control System is confirmed OK. When the value in "SPEC" in "DATA MONITOR" mode is NOT within the SP value, the Engine Control System may have one or more malfunctions.

The SP value is used to detect malfunctions that may affect the Engine Control System, but will not illuminate the MIL.

The SP value will be displayed for the following three items:

- B/FUEL SCHDL (The fuel injection pulse width programmed into ECM prior to any learned on board correction)
- A/F ALPHA-B1/B2 (The mean value of air-fuel ratio feedback correction factor per cycle)
- MAS A/F SE-B1/B2 (The signal voltage of the mass air flow sensor)

Component Function Check

INFOID:0000000003856038

1.PRECONDITIONING

Check that all of the following conditions are satisfied.

TESTING CONDITION

- Vehicle driven distance: More than 5,000 km (3,107 miles)
- Barometric pressure: 98.3 104.3 kPa (1.003 1.064 kg/cm², 14.25 15.12 psi)
- Atmospheric temperature: 20 30°C (68 86°F)
- Engine coolant temperature: 75 95°C (167 203°F)
- Transmission: Warmed-up
- After the engine is warmed up to normal operating temperature, drive vehicle until "ATF TEMP SE 1" (A/T fluid temperature sensor signal) indicates more than 60°C (140°F).
- Electrical load: Not applied
- Rear window defogger switch, air conditioner switch, lighting switch are OFF. Steering wheel is straight ahead.
- · Engine speed: Idle

>> GO TO 2.

2.PERFORM SPEC IN DATA MONITOR MODE

(II) With CONSULT-III

NOTE:

Perform "SPEC" in "DATA MONITOR" mode in maximum scale display.

- 1. Perform EC-20, "BASIC INSPECTION: Special Repair Requirement".
- Select "B/FUEL SCHDL", "A/F ALPHA-B1", "A/F ALPHA-B2", "MAS A/F SE-B1" and "MAS A/F SE-B2" in "SPEC" of "DATA MONITOR" mode with CONSULT-III.
- Check that monitor items are within the SP value.

Is the measurement value within the SP value?

YES >> INSPECTION END

NO >> Go to EC-137, "Diagnosis Procedure".

< DTC/CIRCUIT DIAGNOSIS >

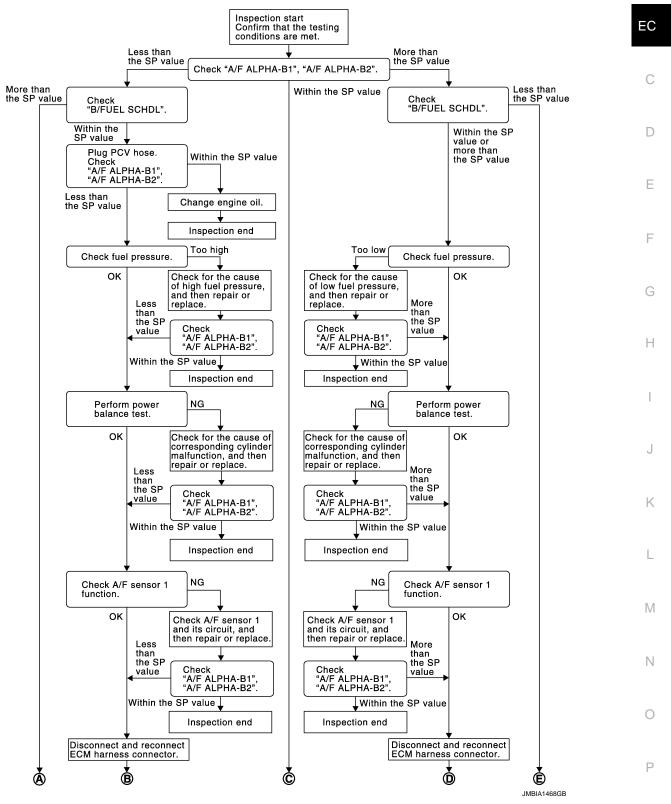
[VQ35HR]

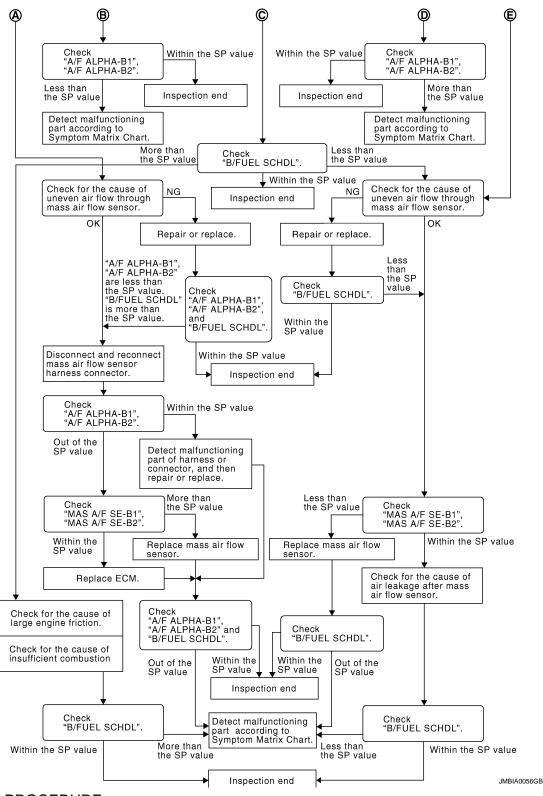
Α

Diagnosis Procedure

INFOID:0000000003856039

OVERALL SEQUENCE





DETAILED PROCEDURE

1.CHECK "A/F ALPHA-B1", "A/F ALPHA-B2"

(E)With CONSULT-III

- Start engine.
- Confirm that the testing conditions are met. Refer to <u>EC-136, "Component Function Check"</u>.
- Select "A/F ALPHA-B1", "A/F ALPHA-B2" in "SPEC" of "DATA MONITOR" mode, and check that each indication is within the SP value.

TROUBLE DIAGNOSIS - SPECIFICATION VALUE < DTC/CIRCUIT DIAGNOSIS > [VQ35HR]	
NOTE: Check "A/F ALPHA-B1", "A/F ALPHA-B2" for approximately 1 minute because they may fluctuate. It is NG if the indication is out of the SP value even a little.	А
Is the measurement value within the SP value? YES >> GO TO 17. NO-1 >> Less than the SP value: GO TO 2. NO-2 >> More than the SP value: GO TO 3.	EC
2.CHECK "B/FUEL SCHDL"	С
Select "B/FUEL SCHDL" in "SPEC" of "DATA MONITOR" mode, and check that the indication is within the SP value.	
Is the measurement value within the SP value? YES >> GO TO 4. NO >> More than the SP value: GO TO 19.	D
3.CHECK "B/FUEL SCHDL"	Е
Select "B/FUEL SCHDL" in "SPEC" of "DATA MONITOR" mode, and check that the indication is within the SP value.	F
Is the measurement value within the SP value? YES >> GO TO 6. NO-1 >> More than the SP value: GO TO 6. NO-2 >> Less than the SP value: GO TO 25.	G
4.CHECK "A/F ALPHA-B1", "A/F ALPHA-B2"	
 Stop the engine. Disconnect PCV hose, and then plug it. Start engine. Select "A/F ALPHA-B1", "A/F ALPHA-B2" in "SPEC" of "DATA MONITOR" mode, and check that each indication is within the SP value. 	Н
Is the measurement value within the SP value?	
YES >> GO TO 5. NO >> GO TO 6.	J
5.CHANGE ENGINE OIL	K
 Stop the engine. Change engine oil. NOTE: 	1
This symptom may occur when a large amount of gasoline is mixed with engine oil because of driving conditions (such as when engine oil temperature does not rise enough since a journey distance is too short during winter). The symptom will not be detected after changing engine oil or changing driving con-	L
ditions.	M
>> INSPECTION END	
6. CHECK FUEL PRESSURE	Ν
Check fuel pressure. (Refer to EC-567, "Inspection".)	
Is the inspection result normal?	0
YES >> GO TO 9. NO-1 >> Fuel pressure is too high: Replace "fuel filter and fuel pump assembly" and then GO TO 8. NO-2 >> Fuel pressure is too low: GO TO 7.	
7. DETECT MALFUNCTIONING PART	Р
Check fuel hoses and fuel tubes for clogging.	

Revision: 2009 March **EC-139** 2009 FX35/FX50

>> Replace "fuel filter and fuel pump assembly" and then GO TO 8. >> Repair or replace and then GO TO 8.

Is the inspection result normal?

 $8.\mathsf{CHECK}$ "A/F ALPHA-B1", "A/F ALPHA-B2"

YES NO

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

- Start engine.
- Select "A/F ALPHA-B1", "A/F ALPHA-B2" in "SPEC" of "DATA MONITOR" mode, and check that each indication is within the SP value.

Is the measurement value within the SP value?

YES >> INSPECTION END

NO >> GO TO 9.

9.PERFORM POWER BALANCE TEST

- Perform "POWER BALANCE" in "ACTIVE TEST" mode.
- Make sure that the each cylinder produces a momentary engine speed drop.

Is the inspection result normal?

YES >> GO TO 12.

NO >> GO TO 10.

10.detect malfunctioning part

Check the following below.

- Ignition coil and its circuit (Refer to <u>EC-482</u>, "Component Function Check".)
- Fuel injector and its circuit (Refer to EC-472, "Component Function Check".)
- Intake air leakage
- Low compression pressure (Refer to EM-25, "Inspection".)

Is the inspection result normal?

YES >> Replace fuel injector and then GO TO 11.

NO >> Repair or replace malfunctioning part and then GO TO 11.

11. CHECK "A/F ALPHA-B1", "A/F ALPHA-B2"

- Start engine.
- Select "A/F ALPHA-B1", "A/F ALPHA-B2" in "SPEC" of "DATA MONITOR" mode, and check that each indication is within the SP value.

Is the measurement value within the SP value?

YES >> INSPECTION END

NO >> GO TO 12.

12.CHECK A/F SENSOR 1 FUNCTION

Perform all DTC CONFIRMATION PROCEDURE related with A/F sensor 1.

- For DTC P0130, P0150, refer to <u>EC-202, "DTC Logic"</u>.
 For DTC P0131, P0151, refer to <u>EC-206, "DTC Logic"</u>.
- For DTC P0132, P0152, refer to <u>EC-209, "DTC Logic"</u>.
- For DTC P0133, P0153, refer to EC-212, "DTC Logic".
- For DTC P2A00, P2A03, refer to <u>EC-458, "DTC Logic"</u>.

Are any DTCs detected?

YES >> GO TO 13.

>> GO TO 15. NO

13. CHECK A/F SENSOR 1 CIRCUIT

Perform Diagnosis Procedure according to corresponding DTC.

>> GO TO 14.

14.CHECK "A/F ALPHA-B1", "A/F ALPHA-B2"

- 1. Start engine.
- Select "A/F ALPHA-B1", "A/F ALPHA-B2" in "SPEC" of "DATA MONITOR" mode, and check that each indication is within the SP value.

Is the measurement value within the SP value?

YES >> INSPECTION END

>> GO TO 15. NO

15. DISCONNECT AND RECONNECT ECM HARNESS CONNECTOR

Stop the engine.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

2. Disconnect ECM harness connector. Check pin terminal and connector for damage, and then reconnect it.

>> GO TO 16.

16.CHECK "A/F ALPHA-B1", "A/F ALPHA-B2"

EC

Α

1. Start engine.

 Select "A/F ALPHA-B1", "A/F ALPHA-B2" in "SPEC" of "DATA MONITOR" mode, and check that each indication is within the SP value.

Is the measurement value within the SP value?

YES >> INSPECTION END

NO >> Detect malfunctioning part according to EC-555, "Symptom Table".

D

17. CHECK "B/FUEL SCHDL"

Select "B/FUEL SCHDL" in "SPEC" of "DATA MONITOR" mode, and check that the indication is within the SP value.

Е

Is the measurement value within the SP value?

YES >> INSPECTION END

NO-1 >> More than the SP value: GO TO 18.

NO-2 >> Less than the SP value: GO TO 25.

18. DETECT MALFUNCTIONING PART

1. Check for the cause of large engine friction. Refer to the following.

O

Engine oil level is too high

Engine oil viscosity

- Belt tension of power steering, alternator, A/C compressor, etc. is excessive

Н

Noise from engine

- Noise from transmission, etc.

2. Check for the cause of insufficient combustion. Refer to the following.

Valve clearance malfunction

Intake valve timing control function malfunction

- Camshaft sprocket installation malfunction, etc.

J

K

>> Repair or replace malfunctioning part, and then GO TO 30.

19. CHECK INTAKE SYSTEM

Check for the cause of uneven air flow through mass air flow sensor. Refer to the following.

Crushed air ducts

· Malfunctioning seal of air cleaner element

Uneven dirt of air cleaner element

Improper specification of intake air system

Is the inspection result normal?

YES >> GO TO 21.

NO >> Repair or replace malfunctioning part, and then GO TO 20.

20.CHECK "A/F ALPHA-B1", "A/F ALPHA-B2", AND "B/FUEL SCHDL"

N

Select "A/F ALPHA-B1", "A/F ALPHA-B2", and "B/FUEL SCHDL" in "SPEC" of "DATA MONITOR" mode, and check that each indication is within the SP value.

Is the measurement value within the SP value?

YES >> INSPECTION END

NO >> "B/FUEL SCHDL" is more, "A/F ALPHA-B1", "A/F ALPHA-B2" are less than the SP value: GO TO

21. DISCONNECT AND RECONNECT MASS AIR FLOW SENSOR HARNESS CONNECTOR

1. Stop the engine.

Revision: 2009 March

2. Disconnect mass air flow sensor harness connector. Check pin terminal and connector for damage and then reconnect it again.

>> GO TO 22.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

22.CHECK "A/F ALPHA-B1", "A/F ALPHA-B2"

- 1. Start engine.
- Select "A/F ALPHA-B1", "A/F ALPHA-B2" in "SPEC" of "DATA MONITOR" mode, and check that each indication is within the SP value.

Is the measurement value within the SP value?

YES >> Detect malfunctioning part of mass air flow sensor circuit and repair it. Refer to <u>EC-178, "Diagnosis Procedure"</u>. Then GO TO 29.

NO >> GO TO 23.

23. CHECK "MAS A/F SE-B1", "MAS A/F SE-B2"

Select "MAS A/F SE-B1", "MAS A/F SE-B2" in "SPEC" of "DATA MONITOR" mode, and check that the indication is within the SP value.

Is the measurement value within the SP value?

YES >> GO TO 24.

NO >> More than the SP value: Replace malfunctioning mass air flow sensor, and then GO TO 29.

24.REPLACE ECM

- 1. Replace ECM.
- Go to <u>EC-23</u>, "ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT: Special Repair Requirement".

>> GO TO 29.

25. CHECK INTAKE SYSTEM

Check for the cause of uneven air flow through mass air flow sensor. Refer to the following.

- Crushed air ducts
- Malfunctioning seal in air cleaner element
- · Uneven dirt in air cleaner element
- Improper specification in intake air system

Is the inspection result normal?

YES >> GO TO 27.

NO >> Repair or replace malfunctioning part, and then GO TO 26.

26.CHECK "B/FUEL SCHDL"

Select "B/FUEL SCHDL" in "SPEC" of "DATA MONITOR" mode, and check that the indication is within the SP value.

Is the measurement value within the SP value?

YES >> INSPECTION END

NO >> Less than the SP value: GO TO 27.

27.CHECK "MAS A/F SE-B1", "MAS A/F SE-B2"

Select "MAS A/F SE-B1", "MAS A/F SE-B2" in "SPEC" of "DATA MONITOR" mode, and check that the indication is within the SP value.

Is the measurement value within the SP value?

YES >> GO TO 28

NO >> Less than the SP value: Replace malfunctioning mass air flow sensor, and then GO TO 30.

28. CHECK INTAKE SYSTEM

Check for the cause of air leak after the mass air flow sensor. Refer to the following.

- · Disconnection, looseness, and cracks in air duct
- Looseness of oil filler cap
- · Disconnection of oil level gauge
- Open stuck, breakage, hose disconnection, or cracks in PCV valve
- Disconnection or cracks in EVAP purge hose, stuck open EVAP canister purge volume control solenoid valve
- Malfunctioning seal in rocker cover gasket
- · Disconnection, looseness, or cracks in hoses, such as a vacuum hose, connecting to intake air system parts

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

• Malfunctioning seal in intake air system, etc.

>> GO TO 30.

 $29.\mathtt{CHECK}$ "A/F ALPHA-B1", "A/F ALPHA-B2", AND "B/FUEL SCHDL"

Select "A/F ALPHA-B1", "A/F ALPHA-B2", and "B/FUEL SCHDL" in "SPEC" of "DATA MONITOR" mode, and check that each indication is within the SP value.

Is the measurement value within the SP value?

YES >> INSPECTION END

NO >> Detect malfunctioning part according to <a>EC-555, "Symptom Table".

30. CHECK "B/FUEL SCHDL"

Select "B/FUEL SCHDL" in "SPEC" of "DATA MONITOR" mode, and then check that the indication is within the SP value.

Is the measurement value within the SP value?

YES >> INSPECTION END

NO >> Detect malfunctioning part according to <a>EC-555, "Symptom Table".

EC

Α

C

D

Е

F

Н

K

L

M

Ν

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

INFOID:0000000003856040

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- 2. Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK ECM GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Disconnect ECM harness connector.
- 2. Check the continuity between ECM harness connector and ground.

ECM		Ground	Continuity
Connector	Terminal	Ground	Continuity
F101	8		Existed
M107	123	Ground	
	124		
	127		
	128		

3. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 4. NO >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F103, M116
- · Harness for open or short between ECM and ground
 - >> Repair open circuit or short to power in harness or connectors.

4. CHECK ECM POWER SUPPLY CIRCUIT-I

- 1. Reconnect ECM harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between ECM harness connector and ground.

ECM				
	+	_		Voltage
Connector	Terminal	Connector	Terminal	
F102	53	M107	128	Battery voltage

Is the inspection result normal?

YES >> GO TO 6. NO >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E3. F1
- IPDM E/R harness connector E7
- 10 A fuse (No. 44)
- Harness for open or short between ECM and fuse

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

>> Repair open circuit, short to ground or short to power in harness or connectors.

6.CHECK ECM POWER SUPPLY CIRCUIT-II

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Check the voltage between ECM harness connector terminals as follows.

ECM			
Connector	+	_	Voltage
Connector	Terminal	Terminal	
M107	125	128	After turning ignition switch OFF, battery voltage will exist for a few seconds, then drop to approximately 0 V.

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 9.

7.CHECK ECM POWER SUPPLY CIRCUIT-III

- Turn ignition switch ON.
- Check the voltage between IPDM E/R harness connector and ground.

IPDN	I E/R	Ground	Voltage	
Connector	Terminal	Oround	voltage	
E7	53	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 8.

NO >> Replace IPDM E/R.

8. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

9. CHECK ECM POWER SUPPLY CIRCUIT-IV

- Turn ignition switch OFF and wait at least 10 seconds.
- Check the voltage between ECM harness connector terminals as follows.

+		_		Voltage
Connector	Terminal	Connector	Terminal	
F101	24	M107	128	Battery voltage

Is the inspection result normal?

YES >> GO TO 13.

NO >> GO TO 10.

10.CHECK ECM POWER SUPPLY CIRCUIT-V

- Disconnect ECM harness connector.
- 2. Disconnect IPDM E/R harness connector.
- Check the continuity between ECM harness connector and IPDM E/R harness connector.

ECM		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	Continuity
F101	24	E7	69	Existed

EC-145 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

F

K

Ν

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 12. NO >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check the following.

- · Harness connectors E3, F1
- Harness connectors F104, F105
- Harness for open or short between ECM and IPDM E/R

>> Repair open circuit, short to ground or short to power in harness or connectors.

12.CHECK 15 A FUSE

- 1. Disconnect 15 A fuse (No. 50) from IPDM E/R.
- 2. Check 15 A fuse.

Is the inspection result normal?

YES >> GO TO 15.

NO >> Replace 15 A fuse.

13. CHECK ECM POWER SUPPLY CIRCUIT-V

- 1. Disconnect ECM harness connector.
- 2. Disconnect IPDM E/R harness connector.
- 3. Check the continuity between ECM harness connector and IPDM E/R harness connector.

ECM		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	Continuity
M107	125	E7	49	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 15. NO >> GO TO 14.

14. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E106, M6
- Harness for open or short between ECM and IPDM E/R

>> Repair open circuit, short to ground or short to power in harness or connectors.

15. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace IPDM E/R.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

U0101 CAN COMM CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

U0101 CAN COMM CIRCUIT

Description INFOID:0000000004055043

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
U0101	Lost communication with TCM	When ECM is not transmitting or receiving CAN communication signal of OBD (emission-related diagnosis) with TCM for 2 seconds or more.	CAN communication line between TCM and ECM CAN communication line open or shorted

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Turn ignition switch ON and wait at least 3 seconds.
- 2. Check DTC.

Is DTC detected?

YES >> EC-147, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

Go to LAN-22, "Trouble Diagnosis Flow Chart".

INFOID:0000000004055045

EC

Α

С

D

Е

Н

K

M

Ν

0

Р

U0164 CAN COMM CIRCUIT

Description INFOID:000000003856041

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
U0164	Lost communication with Unified meter and A/C amp.	When ECM is not transmitting or receiving CAN communication signal of OBD (emission-related diagnosis) with Unified meter and A/C amp. for 2 seconds or more.	CAN communication line between Unified meter and A/C amp. and ECM CAN communication line open or shorted

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Turn ignition switch ON and wait at least 3 seconds.
- 2. Check DTC.

Is DTC detected?

YES >> EC-148, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

Go to LAN-22, "Trouble Diagnosis Flow Chart".

INFOID:0000000003856043

U1001 CAN COMM CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Α

EC

D

Е

F

Н

K

Ν

U1001 CAN COMM CIRCUIT

Description INFOID:000000004055038

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
U1001	CAN communication line	When ECM is not transmitting or receiving CAN communication signal other than OBD (emission-related diagnosis) for 2 seconds or more.	Harness or connectors (CAN communication line is open or shorted)

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Turn ignition switch ON and wait at least 3 seconds.
- 2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> EC-149, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

Go to LAN-22, "Trouble Diagnosis Flow Chart".

INFOID:0000000004055040

2009 FX35/FX50

Revision: 2009 March EC-149

P0011, P0021 IVT CONTROL

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P0011 or P0021 is displayed with DTC P0075 or P0081, first perform the trouble diagnosis for DTC P0075, P0081. Refer to <u>EC-164</u>, "<u>DTC Logic"</u>.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0011	Intake valve timing (IVT) control perfor- mance (bank 1)		Crankshaft position sensor Camshaft position sensor IVT control solenoid valve
P0021	Intake valve timing (IVT) control perfor- mance (bank 2)	There is a gap between angle of target and phase-control angle degree.	 Accumulation of debris to the signal pick-up portion of the camshaft Timing chain installation Foreign matter caught in the oil groove for intake valve timing control

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is between 10 V and 16 V at idle.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE-I

(P)With CONSULT-III

- 1. Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-III.
- 2. Start engine and warm it up to the normal operating temperature.
- Maintain the following conditions for at least 6 consecutive seconds. Hold the accelerator pedal as steady as possible.

ENG SPEED	1,200 - 2,000 rpm (A constant rotation is maintained)
COOLAN TEMP/S	More than 60°C (140°F)
Selector lever	P or N position

- Let engine idle for 10 seconds.
- Check 1st trip DTC.

Follow the procedure "With CONSULT-III" above.

Is 1st trip DTC detected?

YES >> Go to EC-151, "Diagnosis Procedure"

NO >> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE-II

(E)With CONSULT-III

- Select "DATA MONITOR" mode with CONSULT-III.
- Maintain the following conditions for at least 20 consecutive seconds.

INFOID:0000000003856045

Α

EC

D

Е

Н

Ν

Р

ENG SPEED	1,700 - 3,175 rpm (A constant rotation is maintained.)	
COOLAN TEMP/S	More than 70°C (158°F)	
Selector lever	1st or 2nd position	
Driving location uphill	Driving vehicle uphill (Increased engine load will help maintain the driving conditions required for this test.)	
CAUTION: Always drive vehicle at a safe speed. 3. Check 1st trip DTC.		

With GST

Follow the procedure "With CONSULT-III" above.

Is 1st trip DTC detected?

YES >> Go to EC-151, "Diagnosis Procedure"

NO >> INSPECTION END

Diagnosis Procedure

1. CHECK OIL PRESSURE WARNING LAMP

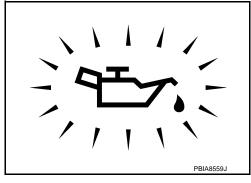
Start engine.

2. Check oil pressure warning lamp and confirm it is not illuminated.

Is oil pressure warning lamp illuminated?

>> Go to LU-6, "Inspection". YES

NO >> GO TO 2.



2.check intake valve timing control solenoid valve

Refer to EC-152, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace malfunctioning intake valve timing control solenoid valve.

3.CHECK CRANKSHAFT POSITION SENSOR

Refer to EC-273, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace crankshaft position sensor.

4.CHECK CAMSHAFT POSITION SENSOR

Refer to EC-279, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace malfunctioning camshaft position sensor.

5.CHECK CAMSHAFT (INTAKE)

Check the following.

< DTC/CIRCUIT DIAGNOSIS >

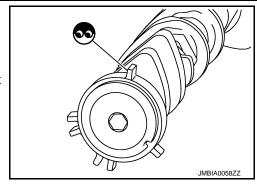
- Accumulation of debris on the signal plate of camshaft rear end
- · Chipping signal plate of camshaft rear end

Is the inspection result normal?

YES >> GO TO 6.

NO >

>> Remove debris and clean the signal plate of camshaft rear end or replace camshaft.



6. CHECK TIMING CHAIN INSTALLATION

Check service records for any recent repairs that may cause timing chain misalignment.

Are there any service records that may cause timing chain misalignment?

YES >> Check timing chain installation. Refer to EM-54, "Removal and Installation".

NO >> GO TO 7.

7.CHECK LUBRICATION CIRCUIT

Perform "Inspection of Camshaft Sprocket (INT) Oil Groove". Refer to EM-74. "Inspection".

Is the inspection result normal?

YES >> GO TO 8.

NO >> Clean lubrication line.

8. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000003856046

1. CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE-I

- Turn ignition switch OFF.
- Disconnect intake valve timing control solenoid valve harness connector.
- 3. Check resistance between intake valve timing control solenoid valve terminals as follows.

Terminals	Resistance
1 and 2	7.0 - 7.7 Ω [at 20°C (68°F)]
1 or 2 and ground	${}^{\infty}\!\Omega$ (Continuity should not exist)

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace malfunctioning intake valve timing control solenoid valve.

2.CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE-II

- 1. Remove intake valve timing control solenoid valve.
- Apply 12 V between intake valve timing control solenoid valve terminals 1 and 2, and then interrupt it. Check that the plunger moves as shown in the figure.

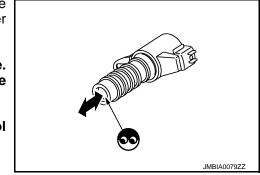
CAUTION:

NOTE:

Never apply 12 V continuously for 5 seconds or more. Doing so may result in damage to the coil in intake valve timing control solenoid valve.

Always replace O-ring when intake valve timing control solenoid valve is removed.

Is the inspection result normal?



P0011, P0021 IVT CONTROL

[VQ35HR] < DTC/CIRCUIT DIAGNOSIS >

YES >> INSPECTION END

>> Replace malfunctioning intake valve timing control solenoid valve. NO

EC

Α

С

D

Е

F

G

Н

J

Κ

L

M

Ν

0

Ρ

P0014, P0024 EVT CONTROL

DTC Logic

DTC DETECTION LOGIC

NOTE:

- If DTC P0014 or P0024 is displayed with DTC P0078, P0084 first perform trouble diagnosis for DTC P0078, P0084. Refer to <u>EC-167</u>, "<u>DTC Logic"</u>.
- If DTC P0014 or P0024 is displayed with DTC P1078, P1084 first perform trouble diagnosis for DTC P1078, P1084. Refer to <u>EC-367</u>, "<u>DTC Logic</u>".

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0014	Exhaust valve timing (EVT) control performance (bank 1)	There is a gap between angle of target and phase-control angle degree.	 Crankshaft position sensor Camshaft position sensor EVT control position sensor
P0024	Exhaust valve timing (EVT) control performance (bank 2)		 EVT control magnet retarder Accumulation of debris to the signal pick-up portion of the camshaft Timing chain installation EVT control pulley assembly

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is between 10 V and 16 V at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE-I

(P)With CONSULT-III

- 1. Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-III.
- 2. Start engine and warm it up to the normal operating temperature.
- Maintain the following conditions for at least 6 consecutive seconds. Hold the accelerator pedal as steady as possible.

ENG SPEED	1,200 - 2,000 rpm (A constant rotation is maintained.)
COOLAN TEMP/S	More than 60°C (140°F)
Selector lever	P or N position

- 4. Let engine idle for 10 seconds.
- Check 1st trip DTC.

With GST

Follow the procedure "With CONSULT-III" above.

Is 1st trip DTC detected?

YES >> Go to EC-155, "Diagnosis Procedure"

NO >> GO TO 3.

3.perform dtc confirmation procedure-ii

(P)With CONSULT-III

- Select "DATA MONITOR" mode with CONSULT-III.
- 2. Maintain the following conditions for at least 20 consecutive seconds.

ENG SPEED	1,400 - 2,950 rpm (A constant rotation is maintained.)
COOLAN TEMP/S	More than 70°C (158°F)
Selector lever	1st or 2nd position
Driving location uphill	Driving vehicle uphill (Increased engine load will help maintain the driving conditions required for this test.)

EC

D

Е

Ν

Р

Α

CAUTION:

Always drive vehicle at a safe speed.

Check 1st trip DTC.

With GST

Follow the procedure "With CONSULT-III" above.

Is 1st trip DTC detected?

YES >> Go to EC-155, "Diagnosis Procedure"

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003856048

1.check function of exhaust valve timing (evt) control

(II) With CONSULT-III

- 1. Turn ignition switch ON.
- 2. Select "EXH V/T ASSIGN ANGLE" in "ACTIVE TEST" mode with CONSULT-III.
- Start engine and keep the engine speed at 2,500 rpm, then touch "START".
- Check that the values of "EXH/V TIM B1" and "EXH/V TIM B2" change when touching "UP" or "DOWN".

(R) Without CONSULT-III

- 1. Start engine and rev engine up above 1,500 rpm.
- Read the voltage signal between ECM harness connector terminals as follows with an oscilloscope.

	ECM			
	+	Voltage signal		
Connector	Terminal	Connector	Terminal	
F101	6 [EVT control magnet retarder (bank 1) signal] 7 [EVT control magnet retarder (bank 2) signal]	M107	128	5V/div JMBIA0034GB

Is the inspection result normal?

YES >> GO TO 10. NO >> GO TO 2.

2.CHECK EVT CONTROL MAGNET RETARDER

Refer to EC-156, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.replace evt control magnet retarder

- Replace malfunctioning EVT control magnet retarder.
- Perform EC-27, "EXHAUST VALVE TIMING CONTROL LEARNING: Special Repair Requirement".

>> INSPECTION END

EC-155 Revision: 2009 March 2009 FX35/FX50

P0014, P0024 EVT CONTROL

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

4. CHECK EVT CONTROL POSITION SENSOR

Refer to EC-371, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace malfunctioning EVT control position sensor.

5. CHECK CRANKSHAFT POSITION SENSOR

Refer to EC-273, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace crankshaft position sensor.

6.CHECK CAMSHAFT POSITION SENSOR

Refer to EC-279, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace malfunctioning camshaft position sensor.

7. CHECK CAMSHAFT (EXH)

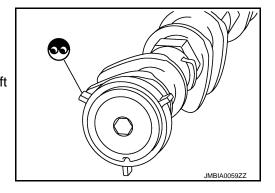
Check the following.

- · Accumulation of debris to the signal plate of camshaft rear end
- · Chipping signal plate of camshaft rear end

Is the inspection result normal?

YES >> GO TO 8.

NO >> Remove debris and clean the signal plate of camshaft rear end or replace camshaft.



8. CHECK TIMING CHAIN INSTALLATION

Check service records for any recent repairs that may cause timing chain misaligned.

Are there any service records that may cause timing chain misaligned?

YES >> Check timing chain installation. Refer to EM-54, "Removal and Installation".

NO >> GO TO 9.

9. REPLACE EVT CONTROL PULLEY ASSEMBLY

- 1. Replace exhaust valve timing control pulley assembly and EVT control magnet retarder. Refer to EM-54, "Removal and Installation" and EM-70, "Removal and Installation".
- Perform EC-27, "EXHAUST VALVE TIMING CONTROL LEARNING: Special Repair Requirement".

>> INSPECTION END

10. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000003856049

1. CHECK EXHAUST VALVE TIMING CONTROL MAGNET RETARDER

- Turn ignition switch OFF.
- Disconnect exhaust valve timing control magnet retarder harness connector.
- Check resistance between exhaust valve timing control magnet retarder terminals as follows.

Revision: 2009 March **EC-156** 2009 FX35/FX50

P0014, P0024 EVT CONTROL

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

< DTC/CIRCUIT	DIAGNOSIS >	[νασσηκ]	<u>i</u>
			_
Terminals	Resistance		Α
1 and 2	9.0 - 11.0 Ω [at 20°C (68°F)]		
Is the inspection			EC
YES >> INSI	PECTION END TO 2.		
	KHAUST VALVE TIMING CONTR	OL MAGNET RETARDER	С
	Ifunctioning exhaust valve timing		-
2. Perform EC	<u>-27, "EXHĂUST VALVE TIMING (</u>	CONTROL LEARNING: Special Repair Requirement".	
INIO	DECTION END		D
>> INSI	PECTION END		
			Е
			F
			G
			Н
			J
			K
			I.
			L
			M
			Ν
			0

Revision: 2009 March **EC-157** 2009 FX35/FX50

P0031, P0032, P0051, P0052 A/F SENSOR 1 HEATER

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

P0031, P0032, P0051, P0052 A/F SENSOR 1 HEATER

Description INFOID:000000003855050

SYSTEM DESCRIPTION

Sensor	Input signal to ECM	ECM function	Actuator
Camshaft position sensor Crankshaft position sensor	Engine speed	Air fuel ratio (A/F) sensor 1 Air fuel ratio (A/F) sensor heater	
Mass air flow sensor	Amount of intake air	TICALOT COTILION	noator

The ECM performs ON/OFF duty control of the A/F sensor 1 heater corresponding to the engine operating condition to keep the temperature of A/F sensor 1 element within the specified range.

DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0031	Air fuel ratio (A/F) sensor 1 heater (bank 1) control circuit low	The current amperage in the A/F sensor 1 heater circuit is out of the normal range. (An excessively low voltage signal is sent to ECM through the A/F sensor 1 heater.)	Harness or connectors (The A/F sensor 1 heater circuit is open or shorted.) A/F sensor 1 heater
P0032	Air fuel ratio (A/F) sensor 1 heater (bank 1) control circuit high	The current amperage in the A/F sensor 1 heater circuit is out of the normal range. (An excessively high voltage signal is sent to ECM through the A/F sensor 1 heater.)	 Harness or connectors (The A/F sensor 1 heater circuit is shorted.) A/F sensor 1 heater
P0051	Air fuel ratio (A/F) sensor 1 heater (bank 2) control circuit low	The current amperage in the A/F sensor 1 heater circuit is out of the normal range. (An excessively low voltage signal is sent to ECM through the A/F sensor 1 heater.)	Harness or connectors (The A/F sensor 1 heater circuit is open or shorted.) A/F sensor 1 heater
P0052	Air fuel ratio (A/F) sensor 1 heater (bank 2) control circuit high	The current amperage in the A/F sensor 1 heater circuit is out of the normal range. (An excessively high voltage signal is sent to ECM through the A/F sensor 1 heater.)	Harness or connectors (The A/F sensor 1 heater circuit is shorted.) A/F sensor 1 heater

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is between 10.5 V and 16 V at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine and let it idle for at least 10 seconds.
- 2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-159, "Diagnosis Procedure".

NG >> INSPECTION END

P0031, P0032, P0051, P0052 A/F SENSOR 1 HEATER

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Diagnosis Procedure

INFOID:0000000003856052

1. CHECK GROUND CONNECTION

- Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK AIR FUEL RATIO (A/F) SENSOR 1 POWER SUPPLY CIRCUIT

- Disconnect A/F sensor 1 harness connector.
- 2. Turn ignition switch ON.
- Check the voltage between A/F sensor 1 harness connector and ground.

DTC		A/F sensor	1	Ground Voltage	Voltago
ыс	Bank	Connector	Terminal	Giodila	voltage
P0031, P0032	1	F3	4	Ground	Battery voltage
P0051, P0052	2	F20	4	Ground	Ballery vollage

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E3, F1
- IPDM E/R harness connector E7
- 15 A fuse (No. 46)
- · Harness for open or short between A/F sensor 1 and fuse

>> Repair or replace harness or connectors.

f 4.CHECK A/F SENSOR 1 HEATER OUTPUT SIGNAL CIRCUIT

- Turn ignition switch OFF.
- Disconnect ECM harness connector.
- Check the continuity between A/F sensor 1 harness connector and ECM harness connector.

DTC		A/F sensor 1		ECM		Continuity	
ы	Bank	Connector	Terminal	Connector	Terminal	Continuity	
P0031, P0032	1	F3	3	F101	1	Existed	
P0051, P0052	2	F20	3	1 101	5	LAISIEU	

Also check harness for short to ground and short to power.

Is the inspection result normal?

YFS >> GO TO 5.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

5.CHECK A/F SENSOR 1 HEATER

Refer to EC-160, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6.

6.REPLACE A/F SENSOR 1

Replace malfunctioning A/F sensor 1.

CAUTION:

EC-159 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

N

Р

P0031, P0032, P0051, P0052 A/F SENSOR 1 HEATER

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

- Discard any A/F sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new A/F sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J-43897-12)] and approved anti-seize lubricant (commercial service tool).

>> INSPECTION END

7.CHECK INTERMITTENT INCIDENT

Perform GI-35, "Intermittent Incident".

>> Repair or replace malfunctioning part.

Component Inspection

INFOID:0000000003856053

1. CHECK AIR FUEL RATIO (A/F) SENSOR 1

- 1. Turn ignition switch OFF.
- 2. Disconnect A/F sensor 1 harness connector.
- 3. Check resistance between A/F sensor 1 terminals as follows.

Terminal	Resistance
3 and 4	1.98 - 2.66 Ω [at 25°C (77°F)]
3 and 1, 2	Ω∞
4 and 1, 2	(Continuity should not exist)

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2 .REPLACE A/F SENSOR 1

Replace malfunctioning A/F sensor 1.

CAUTION:

- Discard any A/F sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new A/F sensor, clean exhaust system threads using Heated Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J-43897-12)] and approved anti-seize lubricant (commercial service tool).

>> INSPECTION END

P0037, P0038, P0057, P0058 HO2S2 HEATER

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Α

EC

D

Е

Р

P0037, P0038, P0057, P0058 HO2S2 HEATER

Description INFOID:0000000003856054

SYSTEM DESCRIPTION

Sensor	Input signal to ECM	ECM function	Actuator	
Camshaft position sensor Crankshaft position sensor	Engine speed	Heated oxygen sensor 2		
Engine coolant temperature sensor	Engine coolant temperature	heater control	Heated oxygen sensor 2 heater	
Mass air flow sensor	Amount of intake air			

The ECM performs ON/OFF control of the heated oxygen sensor 2 heater corresponding to the engine speed, amount of intake air and engine coolant temperature.

OPERATION

Engine speed	Heated oxygen sensor 2 heater	F
Above 3,600 rpm	OFF	
Below 3,600 rpm after the following conditions are met. Engine: After warming up Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load	ON	G

DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0037	Heated oxygen sensor 2 heater (bank 1) control circuit low	The current amperage in the heated oxygen sensor 2 heater circuit is out of the normal range. (An excessively low voltage signal is sent to ECM through the heated oxygen sensor 2 heater.)	Harness or connectors (The heated oxygen sensor 2 heater circuit is open or shorted.) Heated oxygen sensor 2 heater
P0038	Heated oxygen sensor 2 heater (bank 1) control circuit high	The current amperage in the heated oxygen sensor 2 heater circuit is out of the normal range. (An excessively high voltage signal is sent to ECM through the heated oxygen sensor 2 heater.)	 Harness or connectors (The heated oxygen sensor 2 heater circuit is shorted.) Heated oxygen sensor 2 heater
P0057	Heated oxygen sensor 2 heater (bank 2) control circuit low	The current amperage in the heated oxygen sensor 2 heater circuit is out of the normal range. (An excessively low voltage signal is sent to ECM through the heated oxygen sensor 2 heater.)	 Harness or connectors (The heated oxygen sensor 2 heater circuit is open or shorted.) Heated oxygen sensor 2 heater
P0058	Heated oxygen sensor 2 heater (bank 2) control circuit high	The current amperage in the heated oxygen sensor 2 heater circuit is out of the normal range. (An excessively high voltage signal is sent to ECM through the heated oxygen sensor 2 heater.)	Harness or connectors (The heated oxygen sensor 2 heater circuit is shorted.) Heated oxygen sensor 2 heater

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is between 11 V and 16 V at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine and warm it up to the normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Turn ignition switch ON.
- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- 6. Let engine idle for 1 minute.
- 7. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-162, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003856056

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- 2. Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2. CHECK HEATED OXYGEN SENSOR 2 (HO2S2) POWER SUPPLY CIRCUIT

- Disconnect HO2S2 harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between HO2S2 harness connector and ground.

DTC		HO2S2		Ground	Voltage
ы	Bank	Connector	Terminal	Ground	voltage
P0037, P0038	1	F54	2	Ground	Battery voltage
P0057, P0058	2	F53	2	Giodila	Battery voltage

Is the inspection result normal?

YES >> GO TO 4. NO >> GO TO 3.

3.DETECT MALFUNCTIONING PART

Check the following.

- · Harness connectors E3, F1
- IPDM E/R harness connector E7
- 15 A fuse (No. 46)
- Harness for open or short between HO2S2 and fuse

>> Repair open circuit, short to ground or short to power in harness or connectors.

4. CHECK HO2S2 OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- Disconnect ECM harness connector.
- 3. Check the continuity between HO2S2 harness connector and ECM harness connector.

DTC	HO2S2			E	Continuity	
ы	Bank Connector Terminal Co		Connector	Terminal	Continuity	
P0037, P0038	1	F54	3	F101	17	Existed
P0057, P0058	2	F53	3	1 101	33	LAISIEU

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

P0037, P0038, P0057, P0058 HO2S2 HEATER [VQ35HR] < DTC/CIRCUIT DIAGNOSIS > YES >> GO TO 5. NO >> Repair open circuit, short to ground or short to power in harness or connectors. Α ${f 5}.$ CHECK HEATED OXYGEN SENSOR 2 HEATER Refer to EC-163, "Component Inspection". EC Is the inspection result normal? YES >> GO TO 7. NO >> GO TO 6. 6.REPLACE HEATED OXYGEN SENSOR 2 Replace malfunctioning heated oxygen sensor 2. **CAUTION:** D Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one. Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J-43897-12)] and approved anti-seize lubricant (commercial service tool). F >> INSPECTION END .CHECK INTERMITTENT INCIDENT Refer to GI-35, "Intermittent Incident". >> INSPECTION END Н Component Inspection INFOID:0000000003856057 1. CHECK HEATED OXYGEN SENSOR 2 (HO2S2) HEATER Turn ignition switch OFF. Disconnect HO2S2 harness connector. Check resistance between HO2S2 terminals as follows.

Resistance
3.4 - 4.4 Ω [at 25°C (77°F)]
∞ Ω
(Continuity should not exist)

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.REPLACE HEATED OXYGEN SENSOR 2

Replace malfunctioning heated oxygen sensor 2.

CAUTION:

Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.

M

Ν

Р

 Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J-43897-12)] and approved anti-seize lubricant (commercial service tool).

>> INSPECTION END

P0075, P0081 IVT CONTROL SOLENOID VALVE

Description

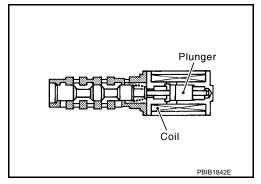
Intake valve timing control solenoid valve is activated by ON/OFF pulse duty (ratio) signals from the ECM.

The intake valve timing control solenoid valve changes the oil amount and direction of flow through intake valve timing control unit or stops oil flow.

The longer pulse width advances valve angle.

The shorter pulse width retards valve angle.

When ON and OFF pulse widths become equal, the solenoid valve stops oil pressure flow to fix the intake valve angle at the control position.



DTC Logic

INFOID:0000000003856059

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0075	Intake valve timing control so- lenoid valve (bank 1) circuit	An improper voltage is sent to the ECM	Harness or connectors (Intake valve timing control solenoid)
P0081	Intake valve timing control so- lenoid valve (bank 2) circuit	through intake valve timing control solenoid valve.	valve circuit is open or shorted.) • Intake valve timing control solenoid valve

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.perform dtc confirmation procedure

- 1. Start engine and let it idle for 5 seconds.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-164, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003856060

1. CHECK INTAKE VALVE TIMING (IVT) CONTROL SOLENOID VALVE POWER SUPPLY CIRCUIT

- Turn ignition switch OFF.
- 2. Disconnect IVT control solenoid valve harness connector.
- Turn ignition switch ON.
- 4. Check the voltage between IVT control solenoid valve harness connector and ground.

DTC	IVT	control soleno	oid valve	Ground	Voltage	
		Connector	Terminal	Ground	voltage	
P0075	1	F28	2	Ground	Battery voltage	
P0081	2	F29	2	Giodila	Battery voltage	

P0075, P0081 IVT CONTROL SOLENOID VALVE [VQ35HR] < DTC/CIRCUIT DIAGNOSIS > Is the inspection result normal? Α YES >> GO TO 3. NO >> GO TO 2. 2.DETECT MALFUNCTIONING PART EC Check the following. Harness connectors E3, F1 Harness for open or short between IVT control solenoid valve and IPDM E/R >> Repair open circuit, short to ground or short to power in harness or connectors. 3.check ivt control solenoid valve output signal circuit for open and short D Turn ignition switch OFF. 2. Disconnect ECM harness connector. Check the continuity between IVT control solenoid valve harness connector and ECM harness connector. IVT control solenoid valve **ECM** DTC Continuity F Bank Connector **Terminal** Connector **Terminal** P0075 1 F28 18 F101 Existed P0081 2 F29 29 4. Also check harness for short to ground and short to power. Is the inspection result normal? YES >> GO TO 4. NO >> Repair open circuit, short to ground or short to power in harness or connectors. 4.CHECK IVT CONTROL SOLENOID VALVE Refer to EC-165, "Component Inspection". Is the inspection result normal? YES >> GO TO 5. NO >> Replace malfunctioning IVT control solenoid valve. CHECK INTERMITTENT INCIDENT Refer to GI-35, "Intermittent Incident". >> INSPECTION END Component Inspection INFOID:0000000004116819 ${f 1}$.CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE-I M Turn ignition switch OFF. 2. Disconnect intake valve timing control solenoid valve harness connector. Check resistance between intake valve timing control solenoid valve terminals as follows. N

Terminals	Resistance	
1 and 2	7.0 - 7.7 Ω [at 20°C (68°F)]	
1 or 2 and ground	${}^{\infty\Omega}$ (Continuity should not exist)	

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace malfunctioning intake valve timing control solenoid valve.

2.CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE-II

Remove intake valve timing control solenoid valve.

EC-165 Revision: 2009 March 2009 FX35/FX50

P0075, P0081 IVT CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Apply 12 V between intake valve timing control solenoid valve terminals 1 and 2, and then interrupt it. Check that the plunger moves as shown in the figure.

CAUTION:

Never apply 12 V continuously for 5 seconds or more. Doing so may result in damage to the coil in intake valve timing control solenoid valve.

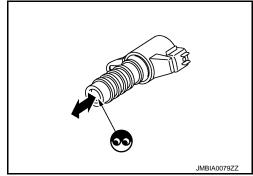
NOTE:

Always replace O-ring when intake valve timing control solenoid valve is removed.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace malfunctioning intake valve timing control solenoid valve.



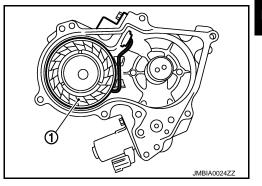
P0078, P0084 EVT CONTROL MAGNET RETARDER

Description INFOID:0000000003856062

Exhaust valve timing control magnet retarder (1) controls the shut/ open timing of the exhaust valve by ON/OFF pulse duty signals sent from the ECM.

The longer pulse width retards valve angle.

The shorter pulse width advances valve angle.



DTC Logic

DTC DETECTION LOGIC

INFOID:0000000003856063

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	C
P0078	Exhaust valve timing control magnet retarder (bank 1) circuit	An improper voltage is sent to the ECM	Harness or connectors (Exhaust valve timing control magnet)	
P0084	Exhaust valve timing control magnet retarder (bank 2) circuit	through exhaust valve timing control magnet retarder.	retarder circuit is open or shorted.) • Exhaust valve timing control magnet retarder	H

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2 Perform DTC Confirmation procedure

- Start engine and let it idle for 5 seconds.
- Check 1st trip DTC.

Is 1st trip DTC detected?

>> Go to EC-167, "Diagnosis Procedure". YES

NO >> INSPECTION END

Diagnosis Procedure

 ${f 1.}$ CHECK EXHAUST VALVE TIMING (EVT) CONTROL MAGNET RETARDER POWER SUPPLY CIRCUIT

- Turn ignition switch OFF.
- Disconnect EVT control magnet retarder harness connector. 2.
- Turn ignition switch ON.
- Check the voltage between EVT control magnet retarder harness connector and ground.

DTC	EVT	control magne	et retarder	Ground	Voltage	
DIC	Bank	Connector	Terminal	Ground	voltage	
P0078	1	F32	1	Ground	Battery voltage	
P0084	2	F41	1	Giodila	Dattery Voltage	

EC-167 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

K

Ν

INFOID:0000000003856064

Р

P0078, P0084 EVT CONTROL MAGNET RETARDER

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?
YES >> GO TO 3.

NO >> GO TO 2.

2.DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E3, F1
- Harness for open or short between EVT control magnet retarder and IPDM E/R
 - >> Repair open circuit, short to ground or short to power in harness or connectors.

${f 3.}$ CHECK EVT CONTROL MAGNET RETARDER OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check the continuity between EVT control magnet retarder harness connector and ECM harness connector.

DTC	EVT control magnet retarder			E	Continuity	
ы	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0078	1	F32	2	F101	6	Existed
P0084	2	F41	2	1 101	7	LAISIGU

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

4. CHECK EVT CONTROL MAGNET RETARDER

Refer to EC-168, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 5.

5.REPLACE EVT CONTROL MAGNET RETARDER

- 1. Replace malfunctioning EVT control magnet retarder.
- 2. Perform EC-27, "EXHAUST VALVE TIMING CONTROL LEARNING: Special Repair Requirement".

>> INSPECTION END

6. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000003856065

[VQ35HR]

1. CHECK EXHAUST VALVE TIMING CONTROL MAGNET RETARDER

- 1. Turn ignition switch OFF.
- 2. Disconnect exhaust valve timing control magnet retarder harness connector.
- 3. Check resistance between exhaust valve timing control magnet retarder terminals as follows.

Terminals	Resistance
1 and 2	9.0 - 11.0 Ω [at 20°C (68°F)]

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

Revision: 2009 March EC-168 2009 FX35/FX50

P0078, P0084 EVT CONTROL MAGNET RETARDER

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

$\overline{2}$.REPLACE EXHAUST VALVE TIMING CONTROL MAGNET RETARDER

1. Replace malfunctioning exhaust valve timing control magnet retarder.

2. Perform EC-27, "EXHAUST VALVE TIMING CONTROL LEARNING: Special Repair Requirement".

>> INSPECTION END

EC

Α

D

Е

F

G

Н

-

J

Κ

L

M

Ν

0

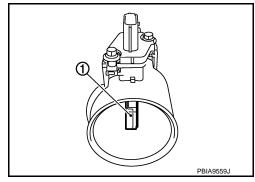
Р

P0101, P010B MAF SENSOR

Description

The mass air flow sensor (1) is placed in the stream of intake air. It measures the intake flow rate by measuring a part of the entire intake flow. The mass air flow sensor controls the temperature of the hot wire to a certain amount. The heat generated by the hot wire is reduced as the intake air flows around it. The greater air flow, the greater the heat loss.

Therefore, the electric current supplied to hot wire is changed to maintain the temperature of the hot wire as air flow increases. The ECM detects the air flow by means of this current change.



DTC Logic

INFOID:0000000003856067

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name		DTC detecting condition	Possible cause
P0101	Mass air flow sensor (bank 1) circuit range/ performance	A)	A high voltage from the sensor is sent to ECM under light load driving condition.	Harness or connectors (The sensor circuit is open or shorted.) Mass air flow sensor EVAP control system pressure sensor
		В)	A low voltage from the sensor is sent to ECM under heavy load driving condition.	Harness or connectors (The sensor circuit is open or shorted.) Intake air leaks Mass air flow sensor EVAP control system pressure sensor Intake air temperature sensor
	Mass air flow sensor	A)	A high voltage from the sensor is sent to ECM under light load driving condition.	Harness or connectors (The sensor circuit is open or shorted.) Mass air flow sensor EVAP control system pressure sensor
P010B	(bank 2) circuit range/ performance	В)	A low voltage from the sensor is sent to ECM under heavy load driving condition.	Harness or connectors (The sensor circuit is open or shorted.) Intake air leaks Mass air flow sensor EVAP control system pressure sensor Intake air temperature sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

NOTE:

If engine will not start or stops soon, wait at least 10 seconds with engine stopped (Ignition switch ON) instead of running engine at idle speed.

>> GO TO 2.

2.perform dtc confirmation procedure for malfunction a

- Start engine and warm it up to normal operating temperature.
- Run engine for at least 10 seconds at idle speed.
- Check 1st trip DTC.

Is 1st trip DTC detected?

>> Go to EC-172, "Diagnosis Procedure".

NO-1 >> With CONSULT-III: GO TO 3.

NO-2 >> With GST: GO TO 5.

3.CHECK MASS AIR FLOW SENSOR FUNCTION

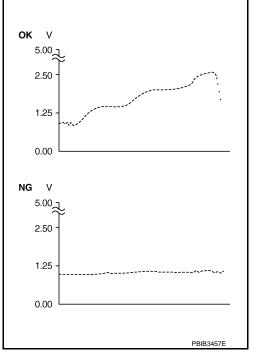
Start engine and warm it up to normal operating temperature. If engine cannot be started, go to EC-172, "Diagnosis Procedure".

- Select "MAS A/F SE-B1/B2" in "DATA MONITOR" mode with CONSULT-III.
- 3. Check the voltage of "MAS A/F SE-B1/B2".
- Increases engine speed to approximately 4,000 rpm.
- 5. Monitor the linear voltage rise in response to engine speed

Is the inspection result normal?

>> GO TO 4. YES

NO >> Go to EC-172, "Diagnosis Procedure".



4. PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION B

Maintain the following conditions for at least 5 consecutive seconds.

ENG SPEED	More than 1,400 rpm
TP SEN 1-B1	More than 1 V
TP SEN 2-B1	More than 1 V
TP SEN 1-B2	More than 1 V
TP SEN 2-B2	More than 1 V
Selector lever	Suitable position
Driving location	Driving vehicle uphill (Increased engine load) will help maintain the driving conditions required for this test.

Always drive vehicle at a safe speed.

2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-172, "Diagnosis Procedure".

NO >> INSPECTION END

EC-171 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

M

Ν

5.PERFORM COMPONENT FUNCTION CHECK FOR MALFUNCTION B

With GST

Perform component function check. Refer to EC-172, "Component Function Check".

NOTE:

Use component function check to check the overall function of the mass air flow sensor circuit. During this check, a 1st trip DTC might not be confirmed.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-172, "Diagnosis Procedure".

Component Function Check

INFOID:0000000003856068

1. PERFORM COMPONENT FUNCTION CHECK FOR MALFUNCTION B

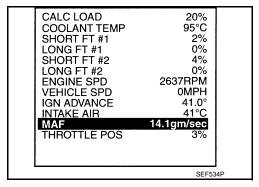
With GST

- 1. Start engine and warm it up to normal operating temperature.
- Select Service \$01 with GST.
- 3. Check the mass air flow sensor signal with Service \$01.
- Check for linear mass air flow sensor signal value rise in response to increases to approximately 4,000 rpm in engine speed.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-172, "Diagnosis Procedure".



Diagnosis Procedure

INFOID:0000000003856069

1.INSPECTION START

Confirm the detected malfunction (A or B). Refer to EC-170, "DTC Logic".

Which malfunction is detected?

A >> GO TO 3.

B >> GO TO 2.

2.CHECK INTAKE SYSTEM

Check the following for connection.

- Air duct
- Vacuum hoses
- Intake air passage between air duct and intake manifold

Is the inspection result normal?

YES >> GO TO 3.

NO >> Reconnect the parts.

3.check ground connection

- Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace ground connection.

4.CHECK MASS AIR FLOW (MAF) SENSOR POWER SUPPLY CIRCUIT

- 1. Disconnect MAF sensor harness connector.
- Turn ignition switch ON.
- Check the voltage between MAF sensor harness connector and ground.

DTC		MAF sensor			Voltage
DIC	Bank Cor		Terminal	Ground	voltage
P0101	1	F31	5	Ground	Battery voltage
P010B	2	F42	5	Ground	Battery Voltage

EC

Α

Is the inspection result normal?

YES >> GO TO 6. NO >> GO TO 5.

DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E106, M6
- Harness connectors M116, F103
- Harness for open or short between MAF sensor and ECM
- Harness for open or short between MAF sensor and IPDM E/R

>> Repair open circuit, short to ground or short to power in harness or connectors.

6.CHECK MAF SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check the continuity between MAF sensor harness connector and ECM harness connector.

DTC		MAF senso	or	EC	Continuity	
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0101	1	F31	4	F102	68	Existed
P010B	2	F42	4	F102	94	Existed

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 7.

>> Repair open circuit, short to ground or short to power in harness or connectors.

.CHECK MAF SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

Check the continuity between MAF sensor harness connector and ECM harness connector.

DTC	MAF sensor			ECM		Continuity
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0101	1	F31	3	F102	77	Existed
P010B	2	F42	3	1 102	79	LAISIEU

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

8. CHECK INTAKE AIR TEMPERATURE SENSOR

Check intake air temperature sensor (bank 1).

Refer to EC-184, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace MAF sensor (bank 1) (with intake air temperature sensor).

9.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-315, "Component Inspection".

EC-173 Revision: 2009 March 2009 FX35/FX50

Е

Н

K

P0101, P010B MAF SENSOR

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 10.

NO >> Replace EVAP control system pressure sensor.

10. CHECK MAF SENSOR

Refer to EC-174, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 11.

NO >> Replace malfunctioning MAF sensor.

11. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000003856070

[VQ35HR]

1. CHECK MASS AIR FLOW (MAF) SENSOR-I

(P)With CONSULT-III

- 1. Turn ignition switch OFF.
- 2. Reconnect all harness connectors disconnected.
- 3. Start engine and warm it up to normal operating temperature.
- 4. Connect CONSULT-III and select "DATA MONITOR" mode.
- 5. Select "MAS A/F SE-B1" and "MAS A/F SE-B2", and check the indication.

Monitor item	Condition	Indication (V)
	Ignition switch ON (Engine stopped.)	Approx. 0.4
MAS A/F SE-B1	Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1
MAS A/F SE-B2	2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7
	Idle to approx. 4,000 rpm	0.8 - 1.1 to approx. 2.4*

^{*:} Check for linear voltage rise in response to engine being increased to approximately 4,000 rpm.

Without CONSULT-III

- 1. Turn ignition switch OFF.
- 2. Reconnect all harness connectors disconnected.
- 3. Start engine and warm it up to normal operating temperature.
- 4. Check the voltage between ECM harness connector terminals under the following conditions.

	ECM				
Connector	+	-	Condition	Voltage (V)	
Connector	Terminal	Terminal			
			Ignition switch ON (Engine stopped.)	Approx. 0.4	
	77 [MAE concor (bank 1)	68	Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1	
	[MAF sensor (bank 1) signal]		2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7	
F102			Idle to approx. 4,000 rpm	0.8 - 1.1 to approx. 2.4*	
F102		94	Ignition switch ON (Engine stopped.)	Approx. 0.4	
	79 [MAF sensor (bank 2) signal]		Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1	
			2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7	
			Idle to approx. 4,000 rpm	0.8 - 1.1 to approx. 2.4*	

^{*:} Check for linear voltage rise in response to engine being increased to approximately 4,000 rpm.

P0101, P010B MAF SENSOR

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> INSPECTION END.

NO >> GO TO 2.

2.check for the cause of uneven air flow through maf sensor

Turn ignition switch OFF.

- Check for the cause of uneven air flow through MAF sensor. Refer to the following.
- Crushed air ducts
- Malfunctioning seal of air cleaner element
- Uneven dirt of air cleaner element
- Improper specification of intake air system parts

Is the inspection result normal?

YES >> GO TO 4. NO >> GO TO 3.

3. CHECK MAF SENSOR-II

(P)With CONSULT-III

- 1. Repair or replace malfunctioning part.
- Start engine and warm it up to normal operating temperature.
- Connect CONSULT-III and select "DATA MONITOR" mode.
- 4. Select "MAS A/F SE-B1" and "MAS A/F SE-B2", and check the indication.

Monitor item	Condition	Indication (V)
	Ignition switch ON (Engine stopped.)	Approx. 0.4
MAS A/F SE-B1	Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1
MAS A/F SE-B2	2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7
	Idle to approx. 4,000 rpm	0.8 - 1.1 to approx. 2.4*

^{*:} Check for linear voltage rise in response to engine being increased to approximately 4,000 rpm.

Without CONSULT-III

- Repair or replace malfunctioning part.
- Start engine and warm it up to normal operating temperature.
- Check the voltage between ECM harness connector terminals under the following conditions.

	ECM			
Connector	+	_	Condition	Voltage (V)
Connector	Terminal	Terminal		
			Ignition switch ON (Engine stopped.)	Approx. 0.4
	77 [MAF sensor (bank 1) signal]	68	Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1
			2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7
F102			Idle to approx. 4,000 rpm	0.8 - 1.1 to approx. 2.4*
F102	79	94	Ignition switch ON (Engine stopped.)	Approx. 0.4
			Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1
	[MAF sensor (bank 2) signal]		2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7
			Idle to approx. 4,000 rpm	0.8 - 1.1 to approx. 2.4*

^{*:} Check for linear voltage rise in response to engine being increased to approximately 4,000 rpm.

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 4. [VQ35HR]

EC

Α

D

Е

F

Н

Ν

Р

4. CHECK MAF SENSOR-III

(P)With CONSULT-III

- 1. Turn ignition switch OFF.
- 2. Disconnect MAF sensor harness connector and reconnect it again.
- 3. Start engine and warm it up to normal operating temperature.
- 4. Connect CONSULT-III and select "DATA MONITOR" mode.
- 5. Select "MAS A/F SE-B1" and "MAS A/F SE-B2", and check the indication.

Monitor item	Condition	Indication (V)
	Ignition switch ON (Engine stopped.)	Approx. 0.4
MAS A/F SE-B1 MAS A/F SE-B2	Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1
	2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7
	Idle to approx. 4,000 rpm	0.8 - 1.1 to approx. 2.4*

^{*:} Check for linear voltage rise in response to engine being increased to approximately 4,000 rpm.

Without CONSULT-III

- 1. Turn ignition switch OFF.
- 2. Disconnect MAF sensor harness connector and reconnect it again.
- 3. Start engine and warm it up to normal operating temperature.
- 4. Check the voltage between ECM harness connector terminals under the following conditions.

	ECM				
Connector	+	-	Condition	Voltage (V)	
Connector	Terminal	Terminal			
			Ignition switch ON (Engine stopped.)	Approx. 0.4	
	77 [MAF sensor (bank 1) signal]	68	Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1	
			2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7	
F102			Idle to approx. 4,000 rpm	0.8 - 1.1 to approx. 2.4*	
F102	79	94	Ignition switch ON (Engine stopped.)	Approx. 0.4	
			Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1	
	[MAF sensor (bank 2) signal]		2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7	
			Idle to approx. 4,000 rpm	0.8 - 1.1 to approx. 2.4*	

^{*:} Check for linear voltage rise in response to engine being increased to approximately 4,000 rpm.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Clean or replace malfunctioning MAF sensor.

Α

D

Е

F

K

M

Ν

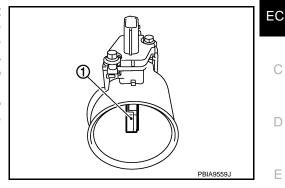
Р

P0102, P0103, P010C, P010D MAF SENSOR

Description INFOID:0000000003942006

The mass air flow sensor (1) is placed in the stream of intake air. It measures the intake flow rate by measuring a part of the entire intake flow. The mass air flow sensor controls the temperature of the hot wire to a certain amount. The heat generated by the hot wire is reduced as the intake air flows around it. The greater air flow, the greater the heat loss.

Therefore, the electric current supplied to hot wire is changed to maintain the temperature of the hot wire as air flow increases. The ECM detects the air flow by means of this current change.



DTC Logic

INFOID:0000000003856072

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0102	Mass air flow sensor (bank 1) circuit low input	An excessively low voltage from the sensor is sent to ECM.	Harness or connectors (The sensor circuit is open or shorted.) Intake air leaks Mass air flow sensor
P0103	Mass air flow sensor (bank 1) circuit high input	An excessively high voltage from the sensor is sent to ECM.	Harness or connectors (The sensor circuit is open or shorted.) Mass air flow sensor
P010C	Mass air flow sensor (bank 2) circuit low input	An excessively low voltage from the sensor is sent to ECM.	Harness or connectors (The sensor circuit is open or shorted.) Intake air leaks Mass air flow sensor
P010D	Mass air flow sensor (bank 2) circuit high input	An excessively high voltage from the sensor is sent to ECM.	Harness or connectors (The sensor circuit is open or shorted.) Mass air flow sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

Which DTC is detected?

P0102. P010C>>GO TO 2.

P0103, P010D>>GO TO 3.

2.PERFORM DTC CONFIRMATION PROCEDURE FOR DTC P0102 AND P010C

- Start engine and wait at least 5 seconds.
- Check DTC.

Is DTC detected?

YES >> Go to EC-178, "Diagnosis Procedure".

NO >> INSPECTION END

3.PERFORM DTC CONFIRMATION PROCEDURE FOR DTC P0103 AND P010D-I

- 1. Turn ignition switch ON and wait at least 5 seconds.
- 2. Check DTC.

Revision: 2009 March

EC-177 2009 FX35/FX50

P0102, P0103, P010C, P010D MAF SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Is DTC detected?

YES >> Go to EC-178, "Diagnosis Procedure".

NO >> GO TO 4.

4.PERFORM DTC CONFIRMATION PROCEDURE FOR DTC P0103 AND P010D-II

- 1. Start engine and wait at least 5 seconds.
- Check DTC.

Is DTC detected?

YES >> Go to EC-178, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003856073

1. INSPECTION START

Confirm the detected DTC.

Which DTC is detected?

P0102, P010C>>GO TO 2.

P0103, P010D>>GO TO 3.

2.CHECK INTAKE SYSTEM

Check the following for connection.

- Air duct
- Vacuum hoses
- Intake air passage between air duct to intake manifold

Is the inspection result normal?

YES >> GO TO 3.

NO >> Reconnect the parts.

3.CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace ground connection.

4.CHECK MASS AIR FLOW (MAF) SENSOR POWER SUPPLY CIRCUIT

- Disconnect MAF sensor harness connector.
- Turn ignition switch ON.
- 3. Check the voltage between MAF sensor harness connector and ground.

DTC	MAF sensor			Ground	Voltage
ы	Bank	Connector	Terminal	Ground	voltage
P0102, P0103	1	F31	5	Ground	Battory voltago
P010C, P010D	2	F42	5	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E106, M6
- Harness connectors M116, F103
- Harness for open or short between MAF sensor and ECM
- Harness for open or short between MAF sensor and IPDM E/R

>> Repair open circuit, short to ground or short to power in harness or connectors.

P0102, P0103, P010C, P010D MAF SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

6.check maf sensor ground circuit for open and short

- 1. Turn ignition switch OFF.
- Disconnect ECM harness connector.
- Check the continuity between MAF sensor harness connector and ECM harness connector.

DTC	MAF sensor			ECM		Continuity
ыс	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0102, P0103	1	F31	4	F102	68	Existed
P010C, P010D	2	F42	4	1 102	94	LXISIEU

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

7.CHECK MAF SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

Check the continuity between MAF sensor harness connector and ECM harness connector.

DTC	MAF sensor			ECM		Continuity
ыс	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0102, P0103	1	F31	3	F102	77	Existed
P010C, P010D	2	F42	3	F102	79	EXISTEC

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

8.CHECK MAF SENSOR

Refer to EC-179, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace malfunctioning mass air flow sensor.

9. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

1. CHECK MASS AIR FLOW (MAF) SENSOR-I

(P)With CONSULT-III

- Turn ignition switch OFF.
- Reconnect all harness connectors disconnected.
- 3. Start engine and warm it up to normal operating temperature.
- Connect CONSULT-III and select "DATA MONITOR" mode.
- Select "MAS A/F SE-B1" and "MAS A/F SE-B2", and check the indication.

Monitor item	Condition	Indication (V)
MAS A/F SE-B1 MAS A/F SE-B2	Ignition switch ON (Engine stopped.)	Approx. 0.4
	Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1
	2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7
	Idle to approx. 4,000 rpm	0.8 - 1.1 to approx. 2.4*

EC-179 Revision: 2009 March 2009 FX35/FX50

EC

Е

K

M

INFOID:0000000003856074

Ν

P0102, P0103, P010C, P010D MAF SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

*: Check for linear voltage rise in response to engine being increased to approximately 4,000 rpm.

⋈Without CONSULT-III

- 1. Turn ignition switch OFF.
- 2. Reconnect all harness connectors disconnected.
- 3. Start engine and warm it up to normal operating temperature.
- Check the voltage between ECM harness connector terminals under the following conditions.

ECM					
Connector	+ -		Condition	Voltage (V)	
	Terminal Terminal				
F102		68	Ignition switch ON (Engine stopped.)	Approx. 0.4	
	77 [MAF sensor (bank 1) signal]		Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1	
			2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7	
			Idle to approx. 4,000 rpm	0.8 - 1.1 to approx. 2.4*	
	79 [MAF sensor (bank 2) signal]	94	Ignition switch ON (Engine stopped.)	Approx. 0.4	
			ing temperature.)		0.8 - 1.1
			2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7	
			Idle to approx. 4,000 rpm	0.8 - 1.1 to approx. 2.4*	

^{*:} Check for linear voltage rise in response to engine being increased to approximately 4,000 rpm.

Is the inspection result normal?

YES >> INSPECTION END.

NO >> GO TO 2.

2.CHECK FOR THE CAUSE OF UNEVEN AIR FLOW THROUGH MAF SENSOR

- 1. Turn ignition switch OFF.
- 2. Check for the cause of uneven air flow through MAF sensor. Refer to the following.
- Crushed air ducts
- Malfunctioning seal of air cleaner element
- Uneven dirt of air cleaner element
- Improper specification of intake air system parts

Is the inspection result normal?

YES >> GO TO 4. NO >> GO TO 3.

3.CHECK MAF SENSOR-II

(P)With CONSULT-III

- 1. Repair or replace malfunctioning part.
- 2. Start engine and warm it up to normal operating temperature.
- 3. Connect CONSULT-III and select "DATA MONITOR" mode.
- 4. Select "MAS A/F SE-B1" and "MAS A/F SE-B2", and check the indication.

Monitor item	Condition	Indication (V)	
MAS A/F SE-B1 MAS A/F SE-B2	Ignition switch ON (Engine stopped.)	Approx. 0.4	
	Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1	
	2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7	
	Idle to approx. 4,000 rpm	0.8 - 1.1 to approx. 2.4*	

^{*:} Check for linear voltage rise in response to engine being increased to approximately 4,000 rpm.

Without CONSULT-III

- Repair or replace malfunctioning part.
- Start engine and warm it up to normal operating temperature.

P0102, P0103, P010C, P010D MAF SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

3. Check the voltage between ECM harness connector terminals under the following conditions.

ECM					
Connector	+	_	Condition	Voltage (V)	
Connector	Terminal	Terminal			
			Ignition switch ON (Engine stopped.)	Approx. 0.4	
	77 [MAF sensor (bank 1)	68	Idle (Engine is warmed-up to normal operating temperature.) 0.8 - 1.1		
	signal]	00	2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7	
F102			Idle to approx. 4,000 rpm	0.8 - 1.1 to approx. 2.4*	
F102			Ignition switch ON (Engine stopped.)	Approx. 0.4	
	79	94	Idle (Engine is warmed-up to normal operating temperature.)		
	[MAF sensor (bank 2) signal]	94	2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7	
			Idle to approx. 4,000 rpm	0.8 - 1.1 to approx. 2.4*	

^{*:} Check for linear voltage rise in response to engine being increased to approximately 4,000 rpm.

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 4.

4. CHECK MAF SENSOR-III

(P)With CONSULT-III

- 1. Turn ignition switch OFF.
- 2. Disconnect MAF sensor harness connector and reconnect it again.
- 3. Start engine and warm it up to normal operating temperature.
- 4. Connect CONSULT-III and select "DATA MONITOR" mode.
- 5. Select "MAS A/F SE-B1" and "MAS A/F SE-B2", and check the indication.

Monitor item	Condition	Indication (V)
	Ignition switch ON (Engine stopped.)	Approx. 0.4
MAS A/F SE-B1	Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1
MAS A/F SE-B2	2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7
	Idle to approx. 4,000 rpm	0.8 - 1.1 to approx. 2.4*

^{*:} Check for linear voltage rise in response to engine being increased to approximately 4,000 rpm.

Without CONSULT-III

- 1. Turn ignition switch OFF.
- 2. Disconnect MAF sensor harness connector and reconnect it again.
- 3. Start engine and warm it up to normal operating temperature.
- 4. Check the voltage between ECM harness connector terminals under the following conditions.

EC

Α

D

Е

F

G

Н

1 \

IV

Ν

Р

Revision: 2009 March EC-181 2009 FX35/FX50

	ECM			
Connector	+	_	Condition	Voltage (V)
	Terminal	Terminal		
			Ignition switch ON (Engine stopped.)	Approx. 0.4
	77 [MAF sensor (bank 1) 68 signal]	60	Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1
		00	2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7
F102			Idle to approx. 4,000 rpm	0.8 - 1.1 to approx. 2.4*
F102			Ignition switch ON (Engine stopped.)	Approx. 0.4
	79	Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1	
	[MAF sensor (bank 2) 94 signal]		2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7
			Idle to approx. 4,000 rpm	0.8 - 1.1 to approx. 2.4

^{*:} Check for linear voltage rise in response to engine being increased to approximately 4,000 rpm.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Clean or replace malfunctioning MAF sensor.

Α

EC

D

P0112, P0113 IAT SENSOR

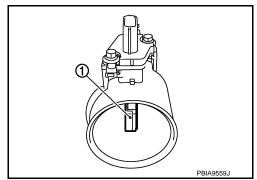
Description

The intake air temperature sensor is built-into the mass air flow sensor (1). The sensor detects intake air temperature and transmits a signal to the ECM.

The temperature sensing unit uses a thermistor which is sensitive to the change in temperature. Electrical resistance of the thermistor decreases in response to the rise in temperature.

NOTE:

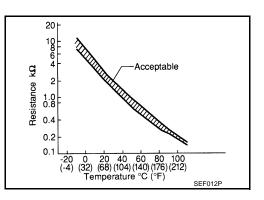
ECM uses only the intake air temperature sensor (bank 1) for engine control and self-diagnosis. It does not use the intake air temperature sensor (bank 2).



<Reference data>

Intake air temperature [°C (°F)]	Voltage* (V)	Resistance (kΩ)
25 (77)	3.3	1.800 - 2.200
80 (176)	1.2	0.283 - 0.359

^{*:} These data are reference values and are measured between ECM terminals 67 (Intake air temperature sensor) and 68 (Sensor ground).



DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0112	Intake air temperature sensor (bank 1) circuit low input	An excessively low voltage from the sensor is sent to ECM.	Harness or connectors (The sensor circuit is open or short-
P0113	Intake air temperature sensor (bank 1) circuit high input	An excessively high voltage from the sensor is sent to ECM.	ed.) • Intake air temperature sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- 1. Turn ignition switch ON and wait at least 5 seconds.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-184, "Diagnosis Procedure".

NO >> INSPECTION END

INFOID:0000000003856076

M

Ν

0

< DTC/CIRCUIT DIAGNOSIS >

Diagnosis Procedure

INFOID:0000000003856077

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- 2. Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2. CHECK INTAKE AIR TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

- Disconnect mass air flow (MAF) sensor (intake air temperature sensor is built-in) (bank 1) harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between MAF sensor (bank 1) harness connector and ground.

MAF sens	or (bank 1)	Ground	Voltage (V)
Connector Terminal		Glound	voltage (v)
F31	2	Ground	Approx. 5

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

3.check intake air temperature sensor ground circuit for open and short

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check the continuity between MAF sensor (bank 1) harness connector and ECM harness connector.

MAF sensor (bank 1)		ECM		Continuity
Connector	Terminal	Connector	Terminal	Continuity
F31	1	F102	68	Existed

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

4. CHECK INTAKE AIR TEMPERATURE SENSOR

Refer to EC-184, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace MAF sensor (with intake air temperature sensor) (bank 1).

5. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000003856078

1. CHECK INTAKE AIR TEMPERATURE SENSOR

- 1. Turn ignition switch OFF.
- Disconnect mass air flow sensor (bank 1) harness connector.
- Check resistance between mass air flow sensor (bank 1) terminals as follows.

P0112, P0113 IAT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Terminals	Condition		Resistance (kΩ)
1 and 2	Temperature [°C (°F)]	25 (77)	1.800 - 2.200

Α

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace mass air flow sensor (with intake air temperature sensor) (bank 1).

EC

С

D

Е

F

G

Н

1

K

L

M

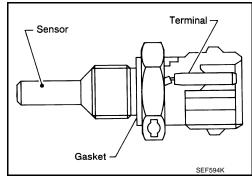
Ν

0

P0116 ECT SENSOR

Description INFOID:000000004052196

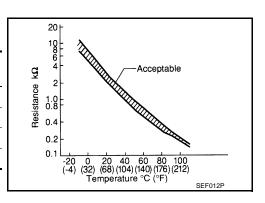
The engine coolant temperature sensor is used to detect the engine coolant temperature. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the engine coolant temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.



<Reference data>

Engine coolant temperature [°C (°F)]	Voltage* (V)	Resistance (kΩ)
-10 (14)	4.4	7.0 - 11.4
20 (68)	3.5	2.37 - 2.63
50 (122)	2.2	0.68 - 1.00
90 (194)	0.9	0.236 - 0.260

^{*:} These data are reference values and are measured between ECM terminals 71 (Engine coolant temperature sensor) and 84 (Sensor ground).



INFOID:0000000004052197

DTC Logic

DTC DETECTION LOGIC

NOTE

If DTC P0116 is displayed with DTC P0117 or P0118, first perform the trouble diagnosis for DTC P0117, P0118. Refer to EC-188, "DTC Logic".

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0116	Engine coolant temperature sensor circuit range/performance	Engine coolant temperature signal from engine coolant temperature sensor does not fluctuate, even when some time has passed after starting the engine with pre-warming up condition.	Harness or connectors (High or low resistance in the circuit) Engine coolant temperature sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TEST CONDITION:

Before performing the following procedure, do not add fuel.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine and warm it up to normal operating temperature.
- 2. Rev engine up to 2,000 rpm for more than 10 minutes.
- Move the vehicle to a cool place, then stop engine.

P0116 ECT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Check resistance between "fuel level sensor unit and fuel pump (main)" terminals 4 and 5.

Soak the vehicle until the resistance between "fuel level sensor unit and fuel pump (main)" terminals 4 and 5 becomes 0.5 k Ω higher than the value measured before soaking.

CAUTION:

Never turn ignition switch ON during soaking.

NOTE:

Soak time changes depending on ambient air temperature. It may take several hours.

- 6. Start engine and let it idle for 5 minutes.
- 7. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-187, "Diagnosis Procedure".

>> INSPECTION END NO

Diagnosis Procedure

1. CHECK GROUND CONNECTIONS

Turn ignition switch OFF.

Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

OK >> GO TO 2.

NG >> Repair or replace ground connections.

2.CHECK ENGINE COOLANT TEMPERATURE SENSOR

Refer to EC-187, "Component Inspection".

Is the inspection result normal?

OK >> GO TO 3.

NG >> Replace engine coolant temperature sensor.

3. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

1. CHECK ENGINE COOLANT TEMPERATURE SENSOR

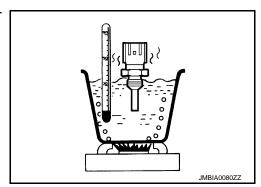
- Turn ignition switch OFF.
- 2. Disconnect engine coolant temperature sensor harness connector.
- Remove engine coolant temperature sensor.
- Check resistance between engine coolant temperature sensor terminals by heating with hot water as shown in the figure.

Terminals	Condition		Resistance (k Ω)
		20 (68)	2.37 - 2.63
1 and 2	Temperature [°C (°F)]	50 (122)	0.68 - 1.00
		90 (194)	0.236 - 0.260

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace engine coolant temperature sensor.



EC

INFOID:0000000004052198

F

Е

Н

INFOID:0000000004052199

N

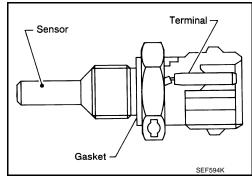
EC-187 Revision: 2009 March 2009 FX35/FX50

INFOID:0000000003856080

P0117, P0118 ECT SENSOR

Description INFOID:000000003856079

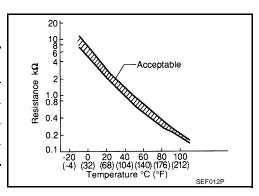
The engine coolant temperature sensor is used to detect the engine coolant temperature. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the engine coolant temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.



<Reference data>

Engine coolant temperature [°C (°F)]	Voltage* (V)	Resistance (kΩ)
-10 (14)	4.4	7.0 - 11.4
20 (68)	3.5	2.37 - 2.63
50 (122)	2.2	0.68 - 1.00
90 (194)	0.9	0.236 - 0.260

^{*:} These data are reference values and are measured between ECM terminals 71 (Engine coolant temperature sensor) and 84 (Sensor ground).



DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0117	Engine coolant tem- perature sensor cir- cuit low input	An excessively low voltage from the sensor is sent to ECM.	Harness or connectors (The sensor circuit is open or shorted.)
P0118	Engine coolant tem- perature sensor cir- cuit high input	An excessively high voltage from the sensor is sent to ECM.	<u> </u>

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- Turn ignition switch ON and wait at least 5 seconds.
- Check DTC.

Is DTC detected?

YES >> Go to EC-189, "Diagnosis Procedure".

NO >> INSPECTION END

Revision: 2009 March **EC-188** 2009 FX35/FX50

P0117, P0118 ECT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR1

Diagnosis Procedure

INFOID:0000000003856081

Α

EC

D

Е

K

Ν

1. CHECK GROUND CONNECTION

1. Turn ignition switch OFF.

Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.check engine coolant temperature (ect) sensor power supply circuit

- Disconnect ECT sensor harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between ECT sensor harness connector and ground.

ECT :	sensor	Ground	Voltage (V)
Connector Terminal		Orouna	voltage (v)
F17	1	Ground	Approx. 5

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F106, F107
- Harness for open or short between ECT sensor and ECM

>> Repair open circuit, short to ground or short to power in harness or connectors.

f 4.CHECK ECT SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- Disconnect ECM harness connector.
- Check the continuity between ECT sensor harness connector and ECM harness connector.

ECT sensor		EC	Continuity	
Connector	Terminal	Connector Terminal		Continuity
F17	2	F102	84	Existed

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

5. CHECK ECT SENSOR

Refer to EC-190, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 6.

Revision: 2009 March

NO >> Replace ECT sensor.

6.CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

EC-189

P0117, P0118 ECT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

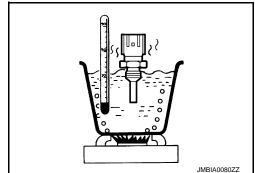
Component Inspection

INFOID:0000000003856082

1.CHECK ENGINE COOLANT TEMPERATURE SENSOR

- 1. Turn ignition switch OFF.
- 2. Disconnect engine coolant temperature sensor harness connector.
- 3. Remove engine coolant temperature sensor.
- 4. Check resistance between engine coolant temperature sensor terminals by heating with hot water as shown in the figure.

Terminals	Condition	Resistance (kΩ)	
		20 (68)	2.37 - 2.63
1 and 2	Temperature [°C (°F)]	50 (122)	0.68 - 1.00
		90 (194)	0.236 - 0.260



Is the inspection result normal?

YES >> INSPECTION END

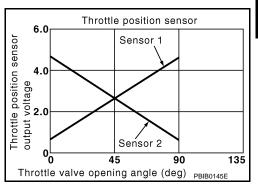
NO >> Replace engine coolant temperature sensor.

P0122, P0123, P0227, P0228 TP SENSOR

Description

Electric throttle control actuator consists of throttle control motor, throttle position sensor, etc. The throttle position sensor responds to the throttle valve movement.

The throttle position sensor has two sensors. These sensors are a kind of potentiometer which transform the throttle valve position into output voltage, and emit the voltage signal to the ECM. The ECM judges the current opening angle of the throttle valve from these signals and controls the throttle valve opening angle in response to driving conditions via the throttle control motor.



DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P0122, P0123, P0227 or P0228 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. Refer to EC-361, "DTC Logic".

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0122	Throttle position (TP) sensor 2 (bank 1) circuit low input	An excessively low voltage from the TP sensor 2 is sent to ECM.	
P0123	Throttle position (TP) sensor 2 (bank 1) circuit high input	An excessively high voltage from the TP sensor 2 is sent to ECM.	Harness or connectors (TP sensor 2 circuit is open or shorted.)
P0227	Throttle position (TP) sensor 2 (bank 2) circuit low input	An excessively low voltage from the TP sensor 2 is sent to ECM.	Electric throttle control actuator (TP sensor 2)
P0228	Throttle position (TP) sensor 2 (bank 2) circuit high input	An excessively high voltage from the TP sensor 2 is sent to ECM.	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10 V at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine and let it idle for 1 second.
- Check DTC.

Is DTC detected?

YES >> Go to EC-192, "Diagnosis Procedure".

NO >> INSPECTION END

EC

Α

D

Е

F

Н

K

Ν

2009 FX35/FX50

< DTC/CIRCUIT DIAGNOSIS >

Diagnosis Procedure

INFOID:0000000003856085

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK THROTTLE POSITION SENSOR 2 POWER SUPPLY CIRCUIT

- Disconnect electric throttle control actuator harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between electric throttle control actuator harness connector and ground.

DTC	Electr	ic throttle cont	Ground	Voltage (V)	
ы	Bank	Connector	Terminal	Ground	voltage (v)
P0122, P0123	1	F6	6	Ground	Approx. 5
P0227, P0228	2	F27	1	Ground	дрріох. 3

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

3. CHECK THROTTLE POSITION SENSOR 2 GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check the continuity between electric throttle control actuator harness connector and ECM harness connector.

DTC	Electri	c throttle cont	ECM		Continuity	
ы	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0122, P0123	1	F6	3	F101	40	Existed
P0227, P0228	2	F27	4	FIUI	48	EXISTEC

^{4.} Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

4. CHECK THROTTLE POSITION SENSOR 2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

Check the continuity between electric throttle control actuator harness connector and ECM harness connector.

DTC	Electric throttle control actuator			ECM		Continuity
ы	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0122, P0123	1	F6	5	F101	34	Existed
P0227, P0228	2	F27	3	1 101	35	LAISIEU

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

CHECK THROTTLE POSITION SENSOR

Refer to EC-193, "Component Inspection".

P0122, P0123, P0227, P0228 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6.

6. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

- Replace malfunctioning electric throttle control actuator.
- Go to EC-193, "Special Repair Requirement".

>> INSPECTION END

7. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

1. CHECK THROTTLE POSITION (TP) SENSOR

- Turn ignition switch OFF.
- 2. Reconnect all harness connectors disconnected.
- Perform EC-25, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement".
- Turn ignition switch ON.
- 5. Set selector lever position to D.
- 6. Check the voltage between ECM harness connector terminals under the following conditions.

	ECM				
Connector	+	_	Condition	Voltage (V)	
Connector	Terminal Terminal				
	30 40		Accelerator pedal: Fully released	More than 0.36	
	[TP sensor 1 (bank 1)]	40	Accelerator pedal: Fully depressed	Less than 4.75	
İ	31	48	Accelerator pedal: Fully released	More than 0.36	
F101	[TP sensor 1 (bank 2)]	40	Accelerator pedal: Fully depressed	Less than 4.75	
FIUI	34	40	Accelerator pedal: Fully released	Less than 4.75	
	[TP sensor 2 (bank 1)]	40	Accelerator pedal: Fully depressed	More than 0.36	
	35	48	Accelerator pedal: Fully released	Less than 4.75	
	[TP sensor 2 (bank 2)]	40	Accelerator pedal: Fully depressed	More than 0.36	

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.replace electric throttle control actuator

- Replace malfunctioning electric throttle control actuator.
- Go to EC-193, "Special Repair Requirement".

>> INSPECTION END

Special Repair Requirement

1. PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Refer to EC-25, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement"

>> GO TO 2.

2.PERFORM IDLE AIR VOLUME LEARNING

EC-193 Revision: 2009 March 2009 FX35/FX50

Α

[VQ35HR]

EC

D

Е INFOID:0000000003856086

Н

Ν

INFOID:0000000003856087

P0122, P0123, P0227, P0228 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

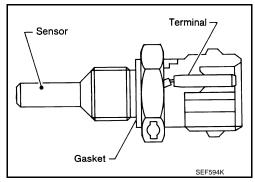
Refer to EC-25, "IDLE AIR VOLUME LEARNING: Special Repair Requirement"

>> END

P0125 ECT SENSOR

Description

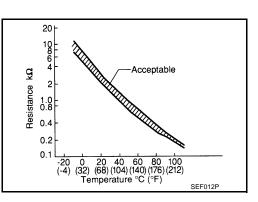
The engine coolant temperature sensor is used to detect the engine coolant temperature. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the engine coolant temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.



<Reference data>

Engine coolant temperature [°C (°F)]	Voltage* (V)	Resistance (kΩ)
-10 (14)	4.4	7.0 - 11.4
20 (68)	3.5	2.37 - 2.63
50 (122)	2.2	0.68 - 1.00
90 (194)	0.9	0.236 - 0.260

^{*:} These data are reference values and are measured between ECM terminals 71 (Engine coolant temperature sensor) and 84 (Sensor ground).



DTC Logic

DTC DETECTION LOGIC

NOTE:

- If DTC P0125 is displayed with DTC P0117 or P0118, first perform the trouble diagnosis for DTC P0117, P0118. Refer to <u>EC-188, "DTC Logic"</u>.
- If DTC P0125 is displayed with DTC P0116, first perform the trouble diagnosis for DTC P0116. Refer to <u>EC-186</u>, "DTC Logic".

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0125	Insufficient engine cool- ant temperature for closed loop fuel control	 Voltage sent to ECM from the sensor is not practical, even when some time has passed after starting the engine. Engine coolant temperature is insufficient for closed loop fuel control. 	Harness or connectors (High resistance in the circuit) Engine coolant temperature sensor Thermostat

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2. CHECK ENGINE COOLANT TEMPERATURE SENSOR FUNCTION

(P)With CONSULT-III

1. Turn ignition switch ON.

Revision: 2009 March **EC-195** 2009 FX35/FX50

EC

Α

С

D

Е

F

G

Н

INFOID:0000000003856089

.1

M

Ν

. .

0

P0125 ECT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

- Select "DATA MONITOR" mode with CONSULT-III.
- Check that "COOLAN TEMP/S" is above 10°C (50°F).

With GST

Follow the procedure "With CONSULT-III" above.

Is the temperature above 10°C (50°F)?

>> INSPECTION END YES

NO >> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

(P)With CONSULT-III

Start engine and run it for 65 minutes at idle speed.

If "COOLAN TEMP/S" increases to more than 10°C (50°F) within 65 minutes, stop engine because the test result will be OK.

CAUTION:

Never overheat engine.

2. Check 1st trip DTC.

Follow the procedure "With CONSULT-III" above.

Is 1st trip DTC detected?

>> <u>EC-196. "Diagnosis Procedure"</u> >> INSPECTION END YES

NO

Diagnosis Procedure

INFOID:0000000003856090

CHECK GROUND CONNECTION

- Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

>> Repair or replace ground connection. NO

2.CHECK ENGINE COOLANT TEMPERATURE SENSOR

Refer to EC-196, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace engine coolant temperature sensor.

3.CHECK THERMOSTAT OPERATION

When the engine is cold [lower than 70°C (158°F)] condition, grasp lower radiator hose and confirm that the engine coolant does not flow.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace thermostat. Refer to CO-22, "Removal and Installation".

4.CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000003856091

${f 1}$.CHECK ENGINE COOLANT TEMPERATURE SENSOR

- Turn ignition switch OFF.
- Disconnect engine coolant temperature sensor harness connector.
- Remove engine coolant temperature sensor.

P0125 ECT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

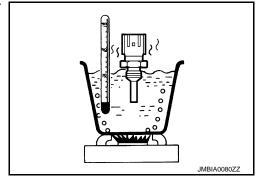
4. Check resistance between engine coolant temperature sensor terminals by heating with hot water as shown in the figure.

Terminals	Condition	Resistance (kΩ)	
		20 (68)	2.37 - 2.63
1 and 2	Temperature [°C (°F)]	50 (122)	0.68 - 1.00
		90 (194)	0.236 - 0.260

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace engine coolant temperature sensor.



EC

Α

С

D

Е

G

F

Н

1

Κ

L

M

Ν

0

P0127 IAT SENSOR

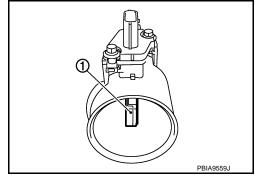
Description INFOID:000000003944014

The intake air temperature sensor is built-into the mass air flow sensor (1). The sensor detects intake air temperature and transmits a signal to the ECM.

The temperature sensing unit uses a thermistor which is sensitive to the change in temperature. Electrical resistance of the thermistor decreases in response to the rise in temperature.

NOTE:

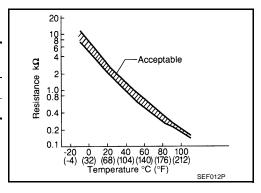
ECM uses only the intake air temperature sensor (bank 1) for engine control and self-diagnosis. It does not use the intake air temperature sensor (bank 2).



<Reference data>

Intake air temperature [°C (°F)]	Voltage* (V)	Resistance (kΩ)
25 (77)	3.3	1.800 - 2.200
80 (176)	1.2	0.283 - 0.359

^{*:} These data are reference values and are measured between ECM terminals 67 (Intake air temperature sensor) and 68 (Sensor ground).



DTC Logic

INFOID:0000000003856093

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0127	Intake air temperature too high	Rationally incorrect voltage from the sensor is sent to ECM, compared with the voltage signal from engine coolant temperature sensor.	Harness or connectors (The sensor circuit is open or shorted) Intake air temperature sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

This test may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT-III

- 1. Wait until engine coolant temperature is less than 96°C (205°F)
- Turn ignition switch ON.
- Select "DATA MONITOR" mode with CONSULT-III.
- Check the engine coolant temperature.

P0127 IAT SENSOR [VQ35HR] < DTC/CIRCUIT DIAGNOSIS > If the engine coolant temperature is not less than 96°C (205°F), turn ignition switch OFF and cool down engine. Α NOTE: Perform the following steps before engine coolant temperature is above 96°C (205°F). 2. Turn ignition switch ON. EC 3. Select "DATA MONITOR" mode with CONSULT-III. Start engine. 5. Hold vehicle speed at more than 70 km/h (43 MPH) for 100 consecutive seconds. CAUTION: Always drive vehicle at a safe speed. 6. Check 1st trip DTC. ■With GST D Follow the procedure "With CONSULT-III" above. Is 1st trip DTC detected? YES >> Go to EC-199, "Diagnosis Procedure". Е NO >> INSPECTION END Diagnosis Procedure INFOID:000000000385609-F 1. CHECK GROUND CONNECTION Turn ignition switch OFF. Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection". Is the inspection result normal? YES >> GO TO 2. Н NO >> Repair or replace ground connection. 2.CHECK INTAKE AIR TEMPERATURE SENSOR Refer to EC-199, "Component Inspection". Is the inspection result normal? YES >> GO TO 3. NO >> Replace mass air flow sensor (bank 1) (with intake air temperature sensor). 3.check intermittent incident Refer to GI-35, "Intermittent Incident". K >> INSPECTION END Component Inspection INFOID:0000000003856095 1. CHECK INTAKE AIR TEMPERATURE SENSOR M Turn ignition switch OFF. Disconnect mass air flow sensor (bank 1) harness connector. Check resistance between mass air flow sensor (bank 1) terminals as follows. N

<u>Is the inspection result normal?</u>

YES >> INSPECTION END

NO >> Replace mass air flow sensor (with intake air temperature sensor) (bank 1).

Р

EC-199 Revision: 2009 March 2009 FX35/FX50

P0128 THERMOSTAT FUNCTION

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P0128 is displayed with DTC P0300, P0301, P0302, P0303, P0304, P0305 or P0306, first perform the trouble diagnosis for DTC P0300, P0301, P0302, P0303, P0304, P0305, P0306. Refer to EC-261. "DTC Logic".

Engine coolant temperature has not risen enough to open the thermostat even though the engine has run long enough.

This is due to a leak in the seal or the thermostat being stuck open.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0128	Thermostat function	The engine coolant temperature does not reach to specified temperature even though the engine has run long enough.	Thermostat Leakage from sealing portion of thermostat Engine coolant temperature sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

- For best results, perform at ambient temperature of -10°C (14°F) or higher.
- For best results, perform at engine coolant temperature of -10°C (14°F) to 56°C (133°F).
- · Before performing the following procedure, do not add fuel.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

(P)With CONSULT-III

- 1. Turn A/C switch OFF.
- 2. Turn blower fan switch OFF.
- 3. Turn ignition switch ON.
- 4. Select "COOLAN TEMP/S" in "DATA MONITOR" mode with CONSULT-III.
- 5. Check the indication of "COOLAN TEMP/S".
 - If it is below 56°C (133°F), go to the next step.
 - If it is above 56°C (133°F), cool engine down to less than 56°C (133°F). Then go to next step.
- 6. Start engine and drive vehicle for 10 consecutive minutes under the following conditions.

VHCL SPEED SE	More than 56 km/h (35 MPH)

CAUTION:

Always drive vehicle at a safe speed.

NOTÉ:

If "COOLAN TEMP/S" increases to more than 75° C (167°F) with in 30 minutes, turn ignition switch OFF because the test result will be OK.

7. Check 1st trip DTC.

With GST

Follow the procedure "With CONSULT-III" above.

Is 1st trip DTC detected?

YES >> Go to EC-201, "Diagnosis Procedure".

NO >> INSPECTION END

P0128 THERMOSTAT FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Diagnosis Procedure

INFOID:0000000003856097

1. CHECK ENGINE COOLANT TEMPERATURE SENSOR

Refer to EC-201, "Component Inspection".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace engine coolant temperature sensor.

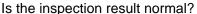
Component Inspection

INFOID:0000000003856098

1. CHECK ENGINE COOLANT TEMPERATURE SENSOR

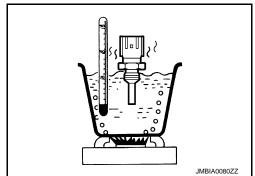
- 1. Turn ignition switch OFF.
- 2. Disconnect engine coolant temperature sensor harness connector.
- 3. Remove engine coolant temperature sensor.
- 4. Check resistance between engine coolant temperature sensor terminals by heating with hot water as shown in the figure.

Terminals	Condition	Resistance ($k\Omega$)	
		20 (68)	2.37 - 2.63
1 and 2	Temperature [°C (°F)]	50 (122)	0.68 - 1.00
		90 (194)	0.236 - 0.260



YES >> INSPECTION END

NO >> Replace engine coolant temperature sensor.



EC

Α

D

Е

F

G

Н

K

.

M

Ν

0

Р

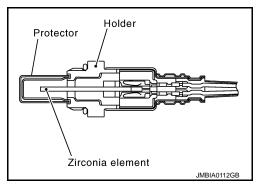
Revision: 2009 March EC-201 2009 FX35/FX50

Description

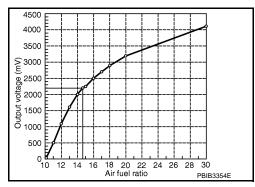
The air fuel ratio (A/F) sensor 1 is a planar one-cell limit current sensor. The sensor element of the A/F sensor 1 is composed an electrode layer, which transports ions. It has a heater in the element.

The sensor is capable of precise measurement $\lambda = 1$, but also in the lean and rich range. Together with its control electronics, the sensor outputs a clear, continuous signal throughout a wide λ range.

The exhaust gas components diffuse through the diffusion layer at the sensor cell. An electrode layer is applied voltage, and this current relative oxygen density in lean. Also this current relative hydrocarbon density in rich.



Therefore, the A/F sensor 1 is able to indicate air fuel ratio by this electrode layer of current. In addition, a heater is integrated in the sensor to ensure the required operating temperature of approximately 800°C (1,472°F).



DTC Logic

DTC DETECTION LOGIC

To judge malfunctions, the diagnosis checks that the air fuel ratio (A/F) signal computed by ECM from the A/F sensor 1 signal fluctuates according to fuel feedback control.

DTC No.	Trouble diagnosis name		DTC detecting condition	Possible Cause
P0130	P0130 Air fuel ratio (A/F) sensor 1	A)	The A/F signal computed by ECM from the A/F sensor 1 signal is constantly in a range other than approx. 2.2 V.	
(bank 1) circuit	B)	The A/F signal computed by ECM from the A/F sensor 1 signal is constantly approx. 2.2 V.	Harness or connectors (The A/F sensor 1 circuit is open	
P0150 Air fuel ratio (A/F) sensor 1		A)	The A/F signal computed by ECM from the A/F sensor 1 signal is constantly in a range other than approx. 2.2 V.	or shorted.) • A/F sensor 1
(bank 2) c	(bank 2) circuit	B)	The A/F signal computed by ECM from the A/F sensor 1 signal is constantly approx. 2.2 V.	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 11 V at idle.

>> GO TO 2.

[VQ35HR] < DTC/CIRCUIT DIAGNOSIS >

2.perform dtc confirmation procedure for malfunction a

- Start engine and warm it up to normal operating temperature. Let it idle for 2 minutes.
- Check 1st trip DTC.

Is 1st trip DTC detected?

>> Go to EC-204, "Diagnosis Procedure". NO-1 >> With CONSULT-III: GO TO 3.

NO-2 >> With GST: GO TO 7.

3.CHECK A/F SENSOR 1 FUNCTION

(P)With CONSULT-III

- Start engine and warm it up to normal operating temperature.
- Select "A/F SEN1 (B1)" or "A/F SEN1 (B2)" in "DATA MONITOR" mode with CONSULT-III.
- 3. Check "A/F SEN1 (B1)" or "A/F SEN1 (B2)" indication.

Does the indication fluctuate around 2.2 V?

YES >> GO TO 4.

NO >> Go to EC-204, "Diagnosis Procedure".

$oldsymbol{4}.$ PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION B-I

- Select "A/F SEN1 (B1) P1276" (for DTC P0130) or "A/F SEN1 (B2) P1286" (for DTC P0150) of "A/F SEN1" in "DTC WORK SUPPORT" mode with CONSULT-III.
- Touch "START".
- When the following conditions are met, "TESTING" will be displayed on the CONSULT-III screen.

ENG SPEED	1,100 - 3,200 rpm
VHCL SPEED SE	More than 64 km/h (40 mph)
B/FUEL SCHDL	1.0 - 8.0 msec
Selector lever	D position

If "TESTING" is not displayed after 20 seconds, retry from step 2.

Always drive vehicle at a safe speed.

Is "TESTING" displayed on CONSULT-III screen?

YES >> GO TO 5.

NO >> Check A/F sensor 1 function again. GO TO 3.

5.PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION B-II

Release accelerator pedal fully.

NOTE:

Never apply brake when releasing the accelerator pedal.

Which does "TESTING" change to?

COMPLETED>>GO TO 6.

OUT OF CONDITION>>Retry DTC CONFIRMATION PROCEDURE. GO TO 4.

$oldsymbol{\circ}$.PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION B-III

Touch "SELF-DIAG RESULT".

Which is displayed on CONSULT-III screen?

YES >> INSPECTION END

NO >> Go to EC-204, "Diagnosis Procedure".

7 PERFORM COMPONENT FUNCTION CHECK FOR MALFUNCTION B

■With GST

Perform component function check. Refer to EC-204, "Component Function Check".

NOTE:

Use component function check to check the overall function of the A/F sensor 1 circuit. During this check, a 1st trip DTC might not be confirmed.

EC-203 Revision: 2009 March 2009 FX35/FX50

EC

Е

F

Н

N

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-204, "Diagnosis Procedure".

Component Function Check

INFOID:0000000003856101

1. PERFORM COMPONENT FUNCTION CHECK

With GST

- 1. Start engine and warm it up to normal operating temperature.
- 2. Drive the vehicle at a speed of 80 km/h (50 MPH) for a few minutes in the suitable gear position.
- Shift the selector lever position to D, then release the accelerator pedal fully until the vehicle speed decreases to 50 km/h (31 MPH).

CAUTION:

Always drive vehicle at a safe speed.

NOTÉ:

Never apply brake when releasing the accelerator pedal.

- 4. Repeat steps 2 and 3 for 5 times.
- 5. Stop the vehicle and turn ignition switch OFF.
- 6. Wait at least 10 seconds and restart engine.
- 7. Repeat steps 2 and 3 for 5 times.
- 8. Stop the vehicle and connect GST to the vehicle.
- 9. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-204, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003856102

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- 2. Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK AIR FUEL RATIO (A/F) SENSOR 1 POWER SUPPLY CIRCUIT

- 1. Disconnect A/F sensor 1 harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between A/F sensor 1 harness connector and ground.

DTC		A/F sensor	r 1	Ground	Voltage
DIC	Bank	Connector	Terminal	Giodila	
P0130	1	F3	4	Ground	Battery voltage
P0150	2	F20	4	Ground	

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E3, F1
- IPDM E/R harness connector E7
- 15 A fuse (No. 46)
- Harness for open or short between A/F sensor 1 and fuse

>> Repair or replace harness or connectors.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

${f 4.}$ CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check the continuity between A/F sensor 1 harness connector and ECM harness connector.

DTC		A/F sensor 1		EC	Continuity	
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0130	1	F3	1	F102	57	
F0130	' '	13	2		61	Existed
P0150	2	F20	1	- 102	65	Existed
F0150		F20	2			66

4. Check the continuity between A/F sensor 1 harness connector or ECM harness connector and ground.

DTC	A/F sensor 1			ECM		Ground	Continuity
DIC	Bank	Connector	Terminal	Connector	Terminal	Giodila	Continuity
D0120	P0130 1 F3	Eo	1	F102	57	Ground	Not existed
F0130		гэ	2		61		
P0150	2 F20 1 2	1	F102	65	Giodila	Not existed	
F0130		2 F20		66			

5. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

5. CHECK INTERMITTENT INCIDENT

Perform GI-35, "Intermittent Incident".

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace malfunctioning part.

 $\mathsf{6}.\mathsf{REPLACE}$ A/F SENSOR 1

Replace malfunctioning A/F sensor 1.

CAUTION:

- Discard any A/F sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new A/F sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J-43897-12)] and approved anti-seize lubricant (commercial service tool).

>> INSPECTION END

EC

D

Е

F

- 11

K

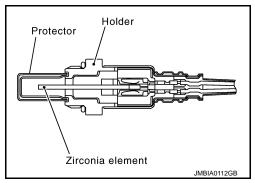
Ν

Description INFOID:000000003856103

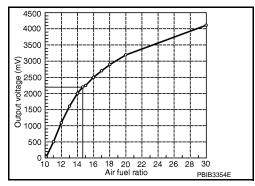
The air fuel ratio (A/F) sensor 1 is a planar one-cell limit current sensor. The sensor element of the A/F sensor 1 is composed an electrode layer, which transports ions. It has a heater in the element.

The sensor is capable of precise measurement $\lambda = 1$, but also in the lean and rich range. Together with its control electronics, the sensor outputs a clear, continuous signal throughout a wide λ range.

The exhaust gas components diffuse through the diffusion layer at the sensor cell. An electrode layer is applied voltage, and this current relative oxygen density in lean. Also this current relative hydrocarbon density in rich.



Therefore, the A/F sensor 1 is able to indicate air fuel ratio by this electrode layer of current. In addition, a heater is integrated in the sensor to ensure the required operating temperature of approximately 800°C (1,472°F).



DTC Logic

DTC DETECTION LOGIC

To judge the malfunction, the diagnosis checks that the air fuel ratio (A/F) signal computed by ECM from the A/F sensor 1 signal is not inordinately low.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible Cause
P0131	Air fuel ratio (A/F) sensor 1 (bank 1) circuit low voltage	The A/F signal computed by ECM from the A/F sensor 1 signal is constantly approx. 0 V.	Harness or connectors (The A/F sensor 1 circuit is open or
P0151	Air fuel ratio (A/F) sensor 1 (bank 2) circuit low voltage		shorted.) • A/F sensor 1

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10.5 V at idle.

>> GO TO 2.

2.CHECK A/F SENSOR FUNCTION

(E)With CONSULT-III

- Start engine and warm it up to normal operating temperature.
- 2. Select "A/F SEN1 (B1)" or "A/F SEN1 (B2)" in "DATA MONITOR" mode with CONSULT-III.
- Check "A/F SEN1 (B1)" or "A/F SEN1 (B2)" indication.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Follow the procedure "With CONSULT-III" above.

Is the indication constantly approx. 0 V?

>> Go to EC-207, "Diagnosis Procedure". YES

NO >> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

(P)With CONSULT-III

- Turn ignition switch OFF, wait at least 10 seconds and then restart engine.
- 2. Drive and accelerate vehicle to more than 40 km/h (25 MPH) within 20 seconds after restarting engine. CAUTION:

Always drive vehicle at a safe speed.

Maintain the following conditions for approximately 20 consecutive seconds.

ENG SPEED	1,000 - 3,200 rpm
VHCL SPEED SE	More than 40 km/h (25 mph)
B/FUEL SCHDL	1.5 - 9.0 msec
Selector lever	Suitable position

NOTE:

- Keep the accelerator pedal as steady as possible during cruising.
- If this procedure is not completed within 1 minute after restarting engine at step 1, return to step
- Check 1st trip DTC.

Follow the procedure "With CONSULT-III" above.

Is 1st trip DTC detected?

YES >> Go to EC-207, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1. CHECK GROUND CONNECTION

- Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38. "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK AIR FUEL RATIO (A/F) SENSOR 1 POWER SUPPLY CIRCUIT

- Disconnect A/F sensor 1 harness connector.
- Turn ignition switch ON.
- Check the voltage between A/F sensor 1 harness connector and ground.

DTC		A/F sensor	Ground	Voltage		
ыс	Bank	Connector	Terminal	Glound	voltage	
P0131	1	F3	4	Ground	Battery voltage	
P0151	2	F20	4	Glound		

Is the inspection result normal?

YES >> GO TO 4. NO >> GO TO 3.

3.DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E3. F1
- IPDM E/R harness connector E7

EC-207 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

F

Н

INFOID:0000000003856105

N

< DTC/CIRCUIT DIAGNOSIS >

- 15 A fuse (No. 46)
- Harness for open or short between A/F sensor 1 and fuse
 - >> Repair or replace harness or connectors.

4. CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check the continuity between A/F sensor 1 harness connector and ECM harness connector.

DTC	A/F sensor 1			EC	Continuity	
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0131	1	F3	1		57	Existed
P0131	'	13	2	F102	61	
D0151	2 F20	1	F 102	65	Existed	
P0151		2		66		

4. Check the continuity between A/F sensor 1 harness connector or ECM harness connector and ground.

DTC	A/F sensor 1			ECM		Ground	Continuity
	Bank Connector		Terminal	Connector	Terminal	Giodila	Continuity
P0131	1	F3	1	F102	57	Ground	Not existed
FUISI	'	13	2		61		
D0151	P0151 2 F20	E20	1	F 102	65		
PUISI		F20	2		66		

5. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

CHECK INTERMITTENT INCIDENT

Perform GI-35, "Intermittent Incident".

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace malfunctioning part.

6.REPLACE A/F SENSOR 1

Replace malfunctioning A/F sensor 1.

CAUTION:

- Discard any A/F sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new A/F sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J-43897-12)] and approved anti-seize lubricant (commercial service tool).

>> INSPECTION END

Α

EC

D

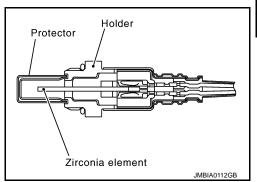
P0132, P0152 A/F SENSOR 1

Description INFOID:0000000003856106

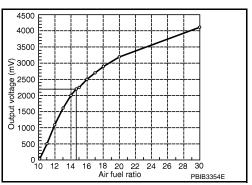
The air fuel ratio (A/F) sensor 1 is a planar one-cell limit current sensor. The sensor element of the A/F sensor 1 is composed an electrode layer, which transports ions. It has a heater in the element.

The sensor is capable of precise measurement $\lambda = 1$, but also in the lean and rich range. Together with its control electronics, the sensor outputs a clear, continuous signal throughout a wide λ range.

The exhaust gas components diffuse through the diffusion layer at the sensor cell. An electrode layer is applied voltage, and this current relative oxygen density in lean. Also this current relative hydrocarbon density in rich.



Therefore, the A/F sensor 1 is able to indicate air fuel ratio by this electrode layer of current. In addition, a heater is integrated in the sensor to ensure the required operating temperature of approximately 800°C (1,472°F).



DTC Logic INFOID:0000000003856107

DTC DETECTION LOGIC

To judge the malfunction, the diagnosis checks that the air fuel ratio (A/F) signal computed by ECM from the A/ F sensor 1 signal is not inordinately high.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible Cause
P0132	Air fuel ratio (A/F) sensor 1 (bank 1) circuit high voltage	The A/F signal computed by ECM from the A/F	Harness or connectors (The A/F sensor 1 circuit is open or
P0152	Air fuel ratio (A/F) sensor 1 (bank 2) circuit high voltage	sensor 1 signal is constantly approx. 5 V.	shorted.) • A/F sensor 1

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10.5 V at idle.

>> GO TO 2.

2. CHECK A/F SENSOR FUNCTION

(P)With CONSULT-III

- 1. Start engine and warm it up to normal operating temperature.
- Select "A/F SEN1 (B1)" or "A/F SEN1 (B2)" in "DATA MONITOR" mode with CONSULT-III.
- Check "A/F SEN1 (B1)" or "A/F SEN1 (B2)" indication.

Р

K

M

Ν

EC-209 Revision: 2009 March 2009 FX35/FX50

< DTC/CIRCUIT DIAGNOSIS >

With GST

Follow the procedure "With CONSULT-III" above.

Is the indication constantly approx. 5 V?

YES >> Go to EC-210, "Diagnosis Procedure".

NO >> GO TO 3.

3. PERFORM DTC CONFIRMATION PROCEDURE

(P)With CONSULT-III

- 1. Turn ignition switch OFF, wait at least 10 seconds and then restart engine.
- Drive and accelerate vehicle to more than 40 km/h (25 MPH) within 20 seconds after restarting engine.
 CAUTION:

Always drive vehicle at a safe speed.

3. Maintain the following conditions for approximately 20 consecutive seconds.

ENG SPEED	1,000 - 3,200 rpm
VHCL SPEED SE	More than 40 km/h (25 mph)
B/FUEL SCHDL	1.5 - 9.0 msec
Selector lever	Suitable position

NOTE:

- Keep the accelerator pedal as steady as possible during cruising.
- If this procedure is not completed within 1 minute after restarting engine at step 1, return to step
- 4. Check 1st trip DTC.

■With GST

Follow the procedure "With CONSULT-III" above.

Is 1st trip DTC detected?

YES >> Go to EC-210, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003856108

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK AIR FUEL RATIO (A/F) SENSOR 1 POWER SUPPLY CIRCUIT

- Disconnect A/F sensor 1 harness connector.
- Turn ignition switch ON.
- Check the voltage between A/F sensor 1 harness connector and ground.

DTC	A/F sensor 1			Ground	Voltage	
ыс	Bank	Connector	Terminal	Giodila	vollage	
P0132	1	F3	4	Ground	Battery voltage	
P0152	2	F20	4	Ground		

Is the inspection result normal?

YES >> GO TO 4. NO >> GO TO 3.

3.DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E3, F1
- IPDM E/R harness connector E7

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

- 15 A fuse (No. 46)
- Harness for open or short between A/F sensor 1 and fuse

>> Repair or replace harness or connectors.

4.CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

Turn ignition switch OFF.

- Disconnect ECM harness connector.
- Check the continuity between A/F sensor 1 harness connector and ECM harness connector.

DTC	A/F sensor 1			EC	Continuity		
DIC	Bank Connector		Terminal	Connector	Terminal		
P0132	1	F3	1		57	Existed	
F0132	1	гэ	2	F102	61		
D0152	2	F30	1		65		
P0152	2 F20	2	•	66			

Check the continuity between A/F sensor 1 harness connector or ECM harness connector and ground.

DTC	A/F sensor 1			ECM		Ground	Continuity
	Bank	Connector	Terminal	Connector	Terminal	Giodila	Continuity
P0132	1	F3	1	F102	57	Ground	Not existed
PU132	'	13	2		61		
P0152 2	2 F20	1	1102	65	Giouna	Not existed	
	2	F20	2	·	66		

5. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

5. CHECK INTERMITTENT INCIDENT

Perform GI-35, "Intermittent Incident".

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace malfunctioning part.

6.REPLACE A/F SENSOR 1

Replace malfunctioning A/F sensor 1.

CAUTION:

- Discard any A/F sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new A/F sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J-43897-12)] and approved anti-seize lubricant (commercial service tool).

>> INSPECTION END

EC-211 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

Н

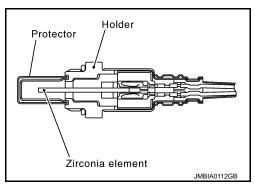
Ν

Description INFOID:000000003856109

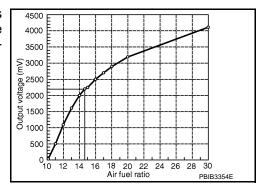
The air fuel ratio (A/F) sensor 1 is a planar one-cell limit current sensor. The sensor element of the A/F sensor 1 is composed an electrode layer, which transports ions. It has a heater in the element.

The sensor is capable of precise measurement $\lambda = 1$, but also in the lean and rich range. Together with its control electronics, the sensor outputs a clear, continuous signal throughout a wide λ range.

The exhaust gas components diffuse through the diffusion layer at the sensor cell. An electrode layer is applied voltage, and this current relative oxygen density in lean. Also this current relative hydrocarbon density in rich.



Therefore, the A/F sensor 1 is able to indicate air fuel ratio by this electrode layer of current. In addition, a heater is integrated in the sensor to ensure the required operating temperature of approximately 800°C (1,472°F).



DTC Logic

DTC DETECTION LOGIC

To judge the malfunction of air fuel ratio (A/F) sensor 1, this diagnosis measures response time of the A/F signal computed by ECM from the A/F sensor 1 signal. The time is compensated by engine operating (speed and load), fuel feedback control constant, and the A/F sensor 1 temperature index. Judgment is based on whether the compensated time (the A/F signal cycling time index) is inordinately long or not.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible Cause
P0133	Air fuel ratio (A/F) sensor 1 (bank 1) circuit slow response		Harness or connectors (The A/F sensor 1 circuit is open or shorted.)
P0153	Air fuel ratio (A/F) sensor 1 (bank 2) circuit slow response	The response of the A/F signal computed by ECM from A/F sensor 1 signal takes more than the specified time.	 A/F sensor 1 A/F sensor 1 heater Fuel pressure Fuel injector Intake air leaks Exhaust gas leaks PCV Mass air flow sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 11 V at idle.

Will CONSULT-III be used?

[VQ35HR1 < DTC/CIRCUIT DIAGNOSIS > YES >> GO TO 2. NO >> GO TO 5. Α 2.PERFORM DTC CONFIRMATION PROCEDURE-I With CONSULT-III EC 1. Start engine and warm it up to normal operating temperature. Turn ignition switch OFF and wait at least 10 seconds. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load. Let engine idle for 1 minute. Select A/F SEN1(B1) P1278/P1279" (for DTC P0133) or A/F SEN1(B2) P1288/P1289" (for DTC P0153) of "A/F SEN1" in "DTC WORK SUPPORT" mode with CONSULT-III. Touch "START". D Is "COMPLETED" displayed on CONSULT-III screen? YES >> GO TO 3 NO >> GO TO 4. Е 3.perform dtc confirmation procedure-ii Touch "SELF-DIAG RESULT". F Which is displayed on CONSULT-III screen? OK >> INSPECTION END NG >> Go to EC-214, "Diagnosis Procedure". f 4 -PERFORM DTC CONFIRMATION PROCEDURE-II After perform the following procedure, "TESTING" will be displayed on the CONSULT-III screen. Increase the engine speed up to between 4,000 and 5,000 rpm and maintain that speed for 10 seconds. Fully release accelerator pedal and then let engine idle for approximately 10 seconds. If "TESTING" is not displayed after 10 seconds, refer to EC-136, "Component Function Check". 2. Wait for approximately 20 seconds idle under the condition that "TESTING" is displayed on the CON-SULT-III screen. 3. Check that "TESTING" changes to "COMPLETED". If "TESTING" changed to "OUT OF CONDITION", refer to EC-136, "Component Function Check". Touch "SELF-DIAG RESULT". Which is displayed on CONSULT-III screen? >> INSPECTION END OK NG >> Go to EC-214, "Diagnosis Procedure". 5.CHECK AIR-FUEL RATIO SELF-LEARNING VALUE **With GST** 1. Start engine and warm it up to normal operating temperature. Select Service \$01 with GST. Calculate the total value of "Short term fuel trim" and "Long term fuel trim" indications. Is the total percentage within ±15%? >> GO TO 7. YES NO >> GO TO 6. N **6.**DETECT MALFUNCTIONING PART Check the following. Intake air leaks Exhaust gas leaks • Incorrect fuel pressure Lack of fuel P Fuel injector • Incorrect PCV hose connection PCV valve Mass air flow sensor

>> Repair or replace malfunctioning part.

Revision: 2009 March **EC-213** 2009 FX35/FX50

7.perform dtc confirmation procedure

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- 3. Let engine idle for 1 minute.
- 4. Increase the engine speed up to between 4,000 and 5,000 rpm and maintain that speed for 10 seconds.
- Fully release accelerator pedal and then let engine idle for approximately 1 minute.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-214, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003856111

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- 2. Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

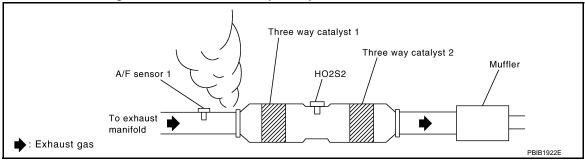
2.retighten air fuel ratio (a/f) sensor 1

Loosen and retighten the A/F sensor 1. Refer to EM-36, "Removal and Installation".

>> GO TO 3.

3. CHECK EXHAUST GAS LEAK

- 1. Start engine and run it at idle.
- Listen for an exhaust gas leak before three way catalyst 1.



Is exhaust gas leak detected?

YES >> Repair or replace malfunctioning part.

NO >> GO TO 4.

4. CHECK FOR INTAKE AIR LEAK

Listen for an intake air leak after the mass air flow sensor.

Is intake air leak detected?

YES >> Repair or replace malfunctioning part.

NO >> GO TO 5.

${f 5}$.CLEAR THE MIXTURE RATIO SELF-LEARNING VALUE

- 1. Clear the mixture ratio self-learning value. Refer to EC-28, "MIXTURE RATIO SELF-LEARNING VALUE CLEAR: Special Repair Requirement".
- Run engine for at least 10 minutes at idle speed.

Is the 1st trip DTC P0171, P172, P0174 or P0175 detected? Is it difficult to start engine?

YES >> Perform trouble diagnosis for DTC P0171, P0174 or P0172, P0175. Refer to <u>EC-237, "DTC Logic"</u> or <u>EC-241, "DTC Logic"</u>.

NO >> GO TO 6.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

6. CHECK A/F SENSOR 1 POWER SUPPLY CIRCUIT

- 1. Disconnect A/F sensor 1 harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between A/F sensor 1 harness connector and ground.

EC

Е

F

Н

Ν

Р

DTC		A/F senso	r 1	Ground	Voltage	
DIC	Bank	Connector	Terminal	Glound		
P0133	1	F3	4	Ground	Battery voltage	
P0153	2	F20	4	Giodila		

Is the inspection result normal?

YES >> GO TO 8.

NO >> GO TO 7.

7.DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E3, F1
- IPDM E/R harness connector E7
- 15 A fuse (No. 46)
- Harness for open or short between A/F sensor 1 and fuse

>> Repair or replace harness or connectors.

8.CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check the continuity between A/F sensor 1 harness connector and ECM harness connector.

DTC	A/F sensor 1			EC	Continuity	
DIO	Bank	Connector	Terminal	Connector Terminal		Continuity
P0133	1	F3	1		57	Existed
P0133	ı	13	2	F102	61	
P0153	2 F20	1	1 102	65	LXISIGU	
PU153		F20	2	;	66	

4. Check the continuity between A/F sensor 1 harness connector or ECM harness connector and ground.

DTC	A/F sensor 1			ECM		Ground	Continuity
	Bank	Connector	Terminal	Connector	Terminal	Giodila	Continuity
P0133	1	F3	1	F102	57	- Ground	Not existed
			2		61		
P0153	2	F20	1		65		
			2		66		

5. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

9. CHECK A/F SENSOR 1 HEATER

Refer to EC-160, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 10.

NO >> GO TO 13.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

10. CHECK MASS AIR FLOW SENSOR

Check both mass air flow sensor (bank 1 and bank 2).

Refer to EC-174, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 11.

NO >> Replace malfunctioning mass air flow sensor.

11. CHECK PCV VALVE

Refer to EC-494, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 12.

NO >> Repair or replace PCV valve.

12. CHECK INTERMITTENT INCIDENT

Perform GI-35, "Intermittent Incident".

Is the inspection result normal?

YES >> GO TO 13.

NO >> Repair or replace malfunctioning part.

13. REPLACE A/F SENSOR 1

Replace malfunctioning A/F sensor 1.

CALITION

- Discard any A/F sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new A/F sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J-43897-12)] and approved anti-seize lubricant (commercial service tool).

>> INSPECTION END

P0137, P0157 HO2S2

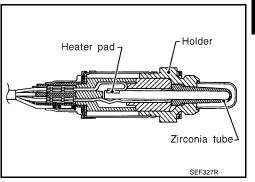
Description INFOID:0000000003856112

The heated oxygen sensor 2, after three way catalyst 1, monitors the oxygen level in the exhaust gas on each bank.

Even if switching characteristics of the air fuel ratio (A/F) sensor 1 are shifted, the air-fuel ratio is controlled to stoichiometric, by the signal from the heated oxygen sensor 2.

This sensor is made of ceramic zirconia. The zirconia generates voltage from approximately 1 V in richer conditions to 0 V in leaner conditions.

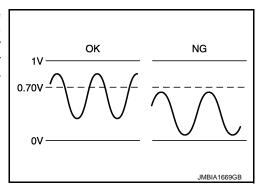
Under normal conditions the heated oxygen sensor 2 is not used for engine control operation.



DTC Logic

DTC DETECTION LOGIC

The heated oxygen sensor 2 has a much longer switching time between rich and lean than the air fuel ratio (A/F) sensor 1. The oxygen storage capacity of the three way catalyst 1 causes the longer switching time. To judge the malfunctions of heated oxygen sensor 2, ECM monitors whether the maximum voltage of the sensor is sufficiently high during various driving conditions such as fuel cut.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	
P0137	Heated oxygen sensor 2 (bank 1) circuit low voltage	The maximum voltage from the sensor does not	, ,	
P0157	Heated oxygen sensor 2 (bank 2) circuit low voltage	reach the specified voltage.	Fuel pressureFuel injectorIntake air leaks	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

Will CONSULT-III be used?

YES >> GO TO 2.

NO >> GO TO 4.

2. PERFORM DTC CONFIRMATION PROCEDURE

(P)With CONSULT-III

TESTING CONDITION:

For better results, perform "DTC WORK SUPPORT" at a temperature of 0 to 30 °C (32 to 86 °F).

- 1. Start engine and warm it up to the normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.

Revision: 2009 March EC-217 2009 FX35/FX50

EC

Α

С

D

Е

F

G

Н

J

L

M

Ν

0

_

- 3. Turn ignition switch ON
- Turn ignition switch OFF and wait at least 10 seconds.
- 5. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- 6. Let engine idle for 1 minute.
- 7. Select "DATA MONITOR" mode with CONSULT-III.
- 8. Check that "COOLAN TEMP/S" indicates more than 70°C (158°F).
 - If not, warm up engine and go to next step when "COOLAN TEMP/S" indication reaches 70°C (158°F).
- 9. Open engine hood.
- 10. Select "HO2S2 (B1) P1147" (for DTC P0137) or "HO2S2 (B2) P1167" (for DTC P0157) of "HO2S2" in "DTC WORK SUPPORT" mode with CONSULT-III.
- 11. Follow the instruction of CONSULT-III display.

NOTE:

It will take at most 10 minutes until "COMPLETED" is displayed.

12. Touch "SELF-DIAG RESULTS".

Which is displayed on CONSULT-III screen?

OK >> INSPECTION END

NG >> Go to EC-219, "Diagnosis Procedure".

CAN NOT BE DIAGNOSED>>GO TO 3.

3.perform dtc confirmation procedure again

- 1. Turn ignition switch OFF and leave the vehicle in a cool place (soak the vehicle).
- 2. Perform DTC confirmation procedure again.

>> GO TO 2.

4. PERFORM COMPONENT FUNCTION CHECK

Perform component function check. Refer to EC-218, "Component Function Check".

NOTE:

Use component function check to check the overall function of the heated oxygen sensor 2 circuit. During this check, a 1st trip DTC might not be confirmed.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-219, "Diagnosis Procedure".

Component Function Check

INFOID:0000000003856114

1. PERFORM COMPONENT FUNCTION CHECK-I

With GST

- 1. Start engine and warm it up to the normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- Let engine idle for 1 minute.
- 7. Check the voltage between ECM harness connector terminals under the following condition.

	ECM					
DTC	Connector	+	_	Condition	Voltage	
Connector	Terminal	Terminal				
P0137	F102	76	84	Revving up to 4,000 rpm under no load at	The voltage should be above 0.70 V at least once during this procedure.	
P0157	1 102	80	04	least 10 times		

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.PERFORM COMPONENT FUNCTION CHECK-II

[VQ35HR]

Check the voltage between ECM harness connector terminals under the following condition.

	EC					
DTC	Connector	+	-	Condition	Voltage	
Connecto	Connector	Terminal	Terminal			
P0137	F102	76	84	Keeping engine at idle for 10 minutes	The voltage should be above 0.70 V at	
P0157	1 102	80	04	Reeping engine at idle for 10 minutes	least once during this procedure.	

Is the inspection result normal?

>> INSPECTION END

NO >> GO TO 3.

3 Perform component function check-iii

Check the voltage between ECM harness connector terminals under the following condition.

	DTC					
DTC			_	Condition	Voltage	
Connector	Terminal	Terminal				
P0137	F102	76	84	Coasting from 80 km/h (50 MPH) in D position	The voltage should be above 0.70 V at least once during this procedure.	
P0157	1 102	80	04			

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-219, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003856115

1. CHECK GROUND CONNECTION

- Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CLEAR THE MIXTURE RATIO SELF-LEARNING VALUE

- Clear the mixture ratio self-learning value. Refer to EC-28, "MIXTURE RATIO SELF-LEARNING VALUE CLEAR: Special Repair Requirement".
- Run engine for at least 10 minutes at idle speed.

Is the 1st trip DTC P0171 or P0174 detected? Is it difficult to start engine?

>> Perform trouble diagnosis for DTC P0171 or P0174. Refer to EC-237, "DTC Logic". YES

NO >> GO TO 3.

3.check heated oxygen sensor 2 (ho2s2) ground circuit for open and short

- Turn ignition switch OFF.
- 2. Disconnect HO2S2 harness connector.
- 3. Disconnect ECM harness connector.
- Check the continuity between HO2S2 harness connector and ECM harness connector.

DTC		HO2S2		EC	Continuity		
DIO	Bank	Connector	Terminal	Connector	Terminal	Continuity	
P0137	1	F54	1	F102	84	Existed	
P0157	2	2 F53		1 102	04	LXISIEU	

5. Also check harness for short to ground and short to power.

Is the inspection result normal?

EC-219 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

K

Ν

YES >> GO TO 4.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

f 4.CHECK HO2S2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

Check the continuity between HO2S2 harness connector and ECM harness connector.

DTC		HO2S2		EC	Continuity	
ыс	Bank Connector		Terminal	Connector Terminal		Continuity
P0137	1	F54	4	F102	76	Existed
P0157	2	F53	4	1 102	80	LAISIEU

2. Check the continuity between HO2S2 harness connector or ECM harness connector and ground.

DTC	HO2S2			ECM		Ground	Continuity
DIC	Bank	Connector	Terminal	Connector	Terminal	Giodila	Continuity
P0137	1	F54	4	F102	76	Ground	Not existed
P0157	2	F53	4	F102	80	Giodila	Not existed

3. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

${f 5.}$ CHECK HEATED OXYGEN SENSOR 2

Refer to EC-220, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 6.

6.REPLACE HEATED OXYGEN SENSOR 2

Replace malfunctioning heated oxygen sensor 2.

CAUTION:

- Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J-43897-12)] and approved anti-seize lubricant (commercial service tool).

>> INSPECTION END

7.CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000003856116

1.INSPECTION START

Will CONSULT-III be used?

Will CONSULT-III be used?

YES >> GO TO 2. NO >> GO TO 3.

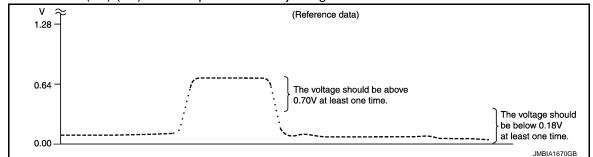
2. CHECK HEATED OXYGEN SENSOR 2 (HO2S2)

(I) With CONSULT-III

1. Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-III.

Revision: 2009 March **EC-220** 2009 FX35/FX50

- Start engine and warm it up to the normal operating temperature.
- Turn ignition switch OFF and wait at least 10 seconds.
- 4. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- Let engine idle for 1 minute.
- Select "FUEL INJECTION" in "ACTIVE TEST" mode, and select "HO2S2 (B1)/(B2)" as the monitor item with CONSULT-III.
- Check "HO2S2 (B1)/(B2)" at idle speed when adjusting "FUEL INJECTION" to ±25%.



"HO2S2 (B1)/(B2)" should be above 0.70 V at least once when the "FUEL INJECTION" is +25%. "HO2S2 (B1)/(B2)" should be below 0.18 V at least once when the "FUEL INJECTION" is -25%.

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 6.

3.CHECK HEATED OXYGEN SENSOR 2-I

Without CONSULT-III

- Start engine and warm it up to the normal operating temperature.
- Turn ignition switch OFF and wait at least 10 seconds.
- Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- Let engine idle for 1 minute.
- Check the voltage between ECM harness connector terminals under the following condition.

	ECM			
Connector	+ -		Condition	Voltage
Connector	Terminal	Terminal		
F102	76 [HO2S2 (bank 1)]		Revving up to 4,000 rpm under no load at least 10 times	The voltage should be above 0.70 V at least once during this procedure.
1 102	80 [HO2S2 (bank 2)]	84		The voltage should be below 0.18 V at least once during this procedure.

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 4.

4. CHECK HEATED OXYGEN SENSOR 2-II

Check the voltage between ECM harness connector terminals under the following condition.

ECM					
Connector	+ -		Condition	Voltage	
Connector	Terminal	Terminal			
E102	76 [HO2S2 (bank 1)]	84	Keeping engine at idle for 10 minutes	The voltage should be above 0.70 V at least once during this procedure.	
F102 –	80 [HO2S2 (bank 2)]			The voltage should be below 0.18 V at least once during this procedure.	

EC-221 Revision: 2009 March 2009 FX35/FX50

Α

EC

D

Е

F

Н

Ν

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 5.

5. CHECK HEATED OXYGEN SENSOR 2-III

Check the voltage between ECM harness connector terminals under the following condition.

ECM					
Connector	+ -		Condition	Voltage	
Connector –	Terminal	Terminal			
F102	76 [HO2S2 (bank 1)]	84	Coasting from 80 km/h (50 MPH) in D position	The voltage should be above 0.70 V at least once during this procedure.	
	80 [HO2S2 (bank 2)]			The voltage should be below 0.18 V at least once during this procedure.	

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 6.

6. REPLACE HEATED OXYGEN SENSOR 2

Replace malfunctioning heated oxygen sensor 2.

CAUTION:

- Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J-43897-12)] and approved anti-seize lubricant (commercial service tool).

>> INSPECTION END

INFOID:0000000003856118

P0138, P0158 HO2S2

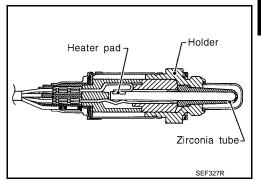
Description

The heated oxygen sensor 2, after three way catalyst 1, monitors the oxygen level in the exhaust gas on each bank.

Even if switching characteristics of the air fuel ratio (A/F) sensor 1 are shifted, the air-fuel ratio is controlled to stoichiometric, by the signal from the heated oxygen sensor 2.

This sensor is made of ceramic zirconia. The zirconia generates voltage from approximately 1 V in richer conditions to 0 V in leaner conditions.

Under normal conditions the heated oxygen sensor 2 is not used for engine control operation.



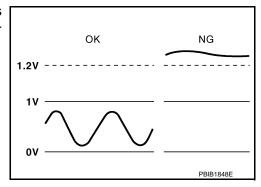
DTC Logic

DTC DETECTION LOGIC

The heated oxygen sensor 2 has a much longer switching time between rich and lean than the air fuel ratio (A/F) sensor 1. The oxygen storage capacity of the three way catalyst 1 causes the longer switching time.

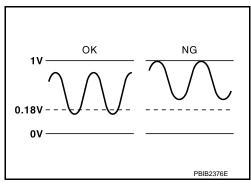
MALFUNCTION A

To judge the malfunctions of heated oxygen sensor 2, ECM monitors whether the voltage is unusually high during various driving conditions such as fuel cut.



MALFUNCTION B

To judge the malfunctions of heated oxygen sensor 2, ECM monitors whether the minimum voltage of sensor is sufficiently low during various driving conditions such as fuel cut.



DTC No.	Trouble diagnosis name		DTC detecting condition	Possible cause
	Heated oxygen sensor 2	A)	An excessively high voltage from the sensor is sent to ECM.	Harness or connectors (The sensor circuit is open or shorted) Heated oxygen sensor 2
P0138	(bank 1) circuit high voltage	B)	The minimum voltage from the sensor is not reached to the specified voltage.	Harness or connectors (The sensor circuit is open or shorted) Heated oxygen sensor 2 Fuel pressure Fuel injector

Revision: 2009 March EC-223 2009 FX35/FX50

EC

Α

C

D

Е

F

G

Н

I

K

ı

M

Ν

0

DTC No.	Trouble diagnosis name		DTC detecting condition	Possible cause
	Heated oxygen sensor 2	A)	An excessively high voltage from the sensor is sent to ECM.	Harness or connectors (The sensor circuit is open or shorted) Heated oxygen sensor 2
P0158	(bank 2) circuit high voltage	В)	The minimum voltage from the sensor is not reached to the specified voltage.	 Harness or connectors (The sensor circuit is open or shorted) Heated oxygen sensor 2 Fuel pressure Fuel injector

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

$2.\mathsf{PERFORM}$ DTC CONFIRMATION PROCEDURE FOR MALFUNCTION A

- 1. Start engine and warm it up to the normal operating temperature.
- Turn ignition switch OFF and wait at least 10 seconds.
- 3. Turn ignition switch ON.
- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- 6. Let engine idle for 2 minutes.
- 7. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-226, "Diagnosis Procedure".

NO-1 >> With CONSULT-III: GO TO 3.

NO-2 >> With GST: GO TO 5.

3.PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION B

(P)With CONSULT-III

NOTE:

For better results, perform "DTC WORK SUPPORT" at a temperature of 0 to 30 °C (32 to 86 °F).

- 1. Start engine and warm it up to the normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- 6. Let engine idle for 1 minute.
- 7. Select "DATA MONITOR" mode with CONSULT-III.
- 8. Check that "COOLAN TEMP/S" indicates more than 70°C (158°F).

 If not, warm up engine and go to next step when "COOLAN TEMP/S" indication reaches 70°C (158°F).
- 9. Open engine hood.
- Select "HO2S2 (B1) P1146" (for DTC P0138) or "HO2S2 (B2) P1166" (for DTC P0158) of "HO2S2" in "DTC WORK SUPPORT" mode with CONSULT-III.
- 11. Follow the instruction of CONSULT-III display.

NOTE:

It will take at most 10 minutes until "COMPLETED" is displayed.

12. Touch "SELF-DIAG RESULTS".

Which is displayed on CONSULT-III screen?

OK >> INSPECTION END

NG >> Go to EC-226, "Diagnosis Procedure".

CON NOT BE DIAGNOSED>>GO TO 4.

P0138, P0158 HO2S2

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

f 4.PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION B AGAIN

- Turn ignition switch OFF and leave the vehicle in a cool place (soak the vehicle).
- Perform DTC confirmation procedure again.

EC

>> GO TO 3.

${f 5.}$ PERFORM COMPONENT FUNCTION CHECK FOR MALFUNCTION B

■With GST

Perform component function check. Refer to EC-225, "Component Function Check".

NOTE:

Use component function check to check the overall function of the heated oxygen sensor 2 circuit. During this check, a 1st trip DTC might not be confirmed.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-226, "Diagnosis Procedure".

Component Function Check

INFOID:0000000003856119

1.PERFORM COMPONENT FUNCTION CHECK-I

With GST

- Start engine and warm it up to the normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON. 3.
- Turn ignition switch OFF and wait at least 10 seconds.
- 5. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- 6. Let engine idle for 1 minute.
- 7. Check the voltage between ECM harness connector terminals under the following condition.

		ECM			Voltage	
DTC	Connector	+	_	Condition		
	Connector	Terminal	Terminal			
P0138	F102	76	84	Revving up to 4,000 rpm under no load at	The voltage should be below 0.18 V at	
P0158	1 102	80	04	least 10 times	least once during this procedure.	

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2 .PERFORM COMPONENT FUNCTION CHECK-II

Check the voltage between ECM harness connector terminals under the following condition.

		ECM				
DTC	Connector	+	-	Condition	Voltage	
	Connector	Terminal	Terminal			
P0138	F102	76	84	Keeping engine at idle for 10 minutes	The voltage should be below 0.18 V at least once during this procedure.	
P0158	1 102	80	04	Recping engine at idle for 10 minutes		

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 3.

$oldsymbol{3}.$ PERFORM COMPONENT FUNCTION CHECK-III

Check the voltage between ECM harness connector terminals under the following condition.

EC-225 Revision: 2009 March 2009 FX35/FX50

D

Е

Н

Ν

		ECM			
DTC	Connector	+	_	Condition	Voltage
	Connector	Terminal	Terminal		
P0138	F102	76	84	Coasting from 80 km/h (50 MPH) in D po-	
P0158	1 102	80	04	sition	least once during this procedure.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-226, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003856120

1. INSPECTION START

Confirm the detected malfunction (A or B). Refer to EC-223, "DTC Logic".

Which malfunction is detected?

A >> GO TO 2

B >> GO TO 9.

2.check ground connection

- 1. Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace ground connection.

3.check heated oxygen sensor 2 (HO2S2) connector for water

- 1. Disconnect HO2S2 harness connector.
- Check that water is not inside connectors.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace harness or connectors.

4. CHECK HO2S2 GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Disconnect HO2S2 harness connector.
- 2. Disconnect ECM harness connector.
- 3. Check the continuity between HO2S2 harness connector and ECM harness connector.

DTC		HO2S2		EC	Continuity	
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0138	1	F54	1	F102	84	Existed
P0158	2	F53	1	F102	04	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

5. CHECK HO2S2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between HO2S2 harness connector and ECM harness connector.

DTC		HO2S2		EC	Continuity		
ыс	Bank Connector		Terminal	Connector	Terminal	Continuity	
P0138	1	F54	4	F102	76	Existed	
P0158	2	F53	4	1 102	80	LAISIEU	

P0138, P0158 HO2S2

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Check the continuity between HO2S2 harness connector or ECM harness connector and ground.

DTC	HO2S2			EC	CM	Ground	Continuity
DIC	Bank	Connector	Terminal	Connector	Terminal	Giodila	Continuity
P0138	1	F54	4	F102	76	Ground	Not existed
P0158	2	F53	4	1 102	80	Giodila	Not existed

EC

Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

O.CHECK HEATED OXYGEN SENSOR 2

Refer to EC-228, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 8. NO >> GO TO 7.

.REPLACE HEATED OXYGEN SENSOR 2

Replace malfunctioning heated oxygen sensor 2.

CAUTION:

 Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.

 Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J-43897-12)] and approved anti-seize lubricant (commercial service tool).

>> INSPECTION END

8.CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

9. CHECK GROUND CONNECTION

Turn ignition switch OFF.

Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair or replace ground connection.

10.CLEAR THE MIXTURE RATIO SELF-LEARNING VALUE

Clear the mixture ratio self-learning value. Refer to EC-28, "MIXTURE RATIO SELF-LEARNING VALUE CLEAR: Special Repair Requirement".

Run engine for at least 10 minutes at idle speed.

Is the 1st trip DTC P0172 or P0175 detected? Is it difficult to start engine?

YES >> Perform trouble diagnosis for DTC P0172, P0175. Refer to EC-241, "DTC Logic".

NO

11. CHECK HO2S2 GROUND CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- 2. Disconnect HO2S2 harness connector.
- Disconnect ECM harness connector.
- Check the continuity between HO2S2 harness connector and ECM harness connector.

Α

Е

F

K

DTC		HO2S2		ECM		Continuity
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0138	1	F54	1	F102	84	Existed
P0158	2	F53	1	1 102	04	LXISIGU

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 12.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

12.CHECK HO2S2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

Check the continuity between HO2S2 harness connector and ECM harness connector.

DTC		HO2S2		EC	Continuity		
ыс	Bank Connector		Terminal	Connector	Terminal	Continuity	
P0138	1	F54	4	F102	76	Existed	
P0158	2	F53	4	F102	80	Existed	

Check the continuity between HO2S2 harness connector or ECM harness connector and ground.

DTC	HO2S2			ECM		Ground	Continuity
DIC	Bank	Connector	Terminal	Connector	Terminal	Giodila	Continuity
P0138	1	F54	4	F102	76	Ground	Not existed
P0158	2	F53	4	1 102	80	Giodila	NOI EXISIEU

Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 13.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

13. CHECK HEATED OXYGEN SENSOR 2

Refer to EC-228, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 15.

NO >> GO TO 14.

14. REPLACE HEATED OXYGEN SENSOR 2

Replace malfunctioning heated oxygen sensor 2.

CAUTION:

- Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J-43897-12)] and approved anti-seize lubricant (commercial service tool).

>> INSPECTION END

15. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000004157674

1.INSPECTION START

P0138, P0158 HO2S2

< DTC/CIRCUIT DIAGNOSIS >

Will CONSULT-III be used?

Will CONSULT-III be used?

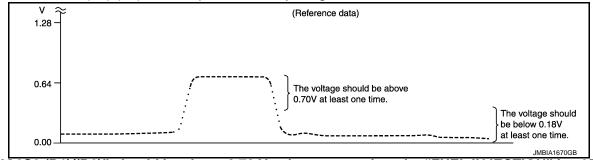
YES >> GO TO 2.

NO >> GO TO 3.

2. CHECK HEATED OXYGEN SENSOR 2 (HO2S2)

(P)With CONSULT-III

- 1. Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-III.
- 2. Start engine and warm it up to the normal operating temperature.
- Turn ignition switch OFF and wait at least 10 seconds.
- 4. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- Let engine idle for 1 minute.
- 6. Select "FUEL INJECTION" in "ACTIVE TEST" mode, and select "HO2S2 (B1)/(B2)" as the monitor item with CONSULT-III.
- 7. Check "HO2S2 (B1)/(B2)" at idle speed when adjusting "FUEL INJECTION" to ±25%.



"HO2S2 (B1)/(B2)" should be above 0.70 V at least once when the "FUEL INJECTION" is +25%. "HO2S2 (B1)/(B2)" should be below 0.18 V at least once when the "FUEL INJECTION" is -25%.

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 6.

3.CHECK HEATED OXYGEN SENSOR 2-I

Without CONSULT-III

- 1. Start engine and warm it up to the normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- Let engine idle for 1 minute.
- 5. Check the voltage between ECM harness connector terminals under the following condition.

ECM				Voltage	
Connector	+ -		Condition		
Connector -	Terminal	Terminal			
F102	76 [HO2S2 (bank 1)]	84	Revving up to 4,000 rpm under no load at	The voltage should be above 0.70 V at least once during this procedure.	
F102	80 [HO2S2 (bank 2)]	04	least 10 times	The voltage should be below 0.18 V at least once during this procedure.	

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 4.

4. CHECK HEATED OXYGEN SENSOR 2-II

Check the voltage between ECM harness connector terminals under the following condition.

EC

Α

[VQ35HR]

C

D

Е

F

Н

. 1

K

L

M

Ν

ECM					
Connector	+	_	Condition	Voltage	
Connector	Terminal	Terminal			
F102	76 [HO2S2 (bank 1)]		Keeping engine at idle for 10 minutes	The voltage should be above 0.70 V at least once during this procedure.	
1 102	80 [HO2S2 (bank 2)]	84	recepting engine at tale for 10 minutes	The voltage should be below 0.18 V at least once during this procedure.	

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 5.

5. CHECK HEATED OXYGEN SENSOR 2-III

Check the voltage between ECM harness connector terminals under the following condition.

	ECM				
Connector	+ -		Condition	Voltage	
Connector	Terminal	Terminal			
F102	76 [HO2S2 (bank 1)]	84	Coasting from 80 km/h (50 MPH) in D po-	The voltage should be above 0.70 V at least once during this procedure.	
F102	80 [HO2S2 (bank 2)]	04	sition	The voltage should be below 0.18 V at least once during this procedure.	

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 6.

6.REPLACE HEATED OXYGEN SENSOR 2

Replace malfunctioning heated oxygen sensor 2.

CAUTION:

- Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J-43897-12)] and approved anti-seize lubricant (commercial service tool).

>> INSPECTION END

[VQ35HR]

P0139, P0159 HO2S2

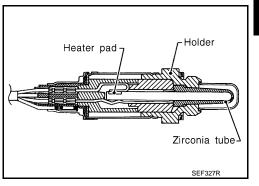
Description INFOID:0000000003942849

The heated oxygen sensor 2, after three way catalyst 1, monitors the oxygen level in the exhaust gas on each bank.

Even if switching characteristics of the air fuel ratio (A/F) sensor 1 are shifted, the air-fuel ratio is controlled to stoichiometric, by the signal from the heated oxygen sensor 2.

This sensor is made of ceramic zirconia. The zirconia generates voltage from approximately 1 V in richer conditions to 0 V in leaner conditions.

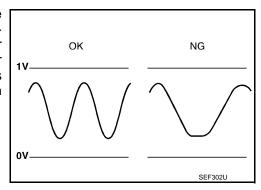
Under normal conditions the heated oxygen sensor 2 is not used for engine control operation.



DTC Logic

DTC DETECTION LOGIC

The heated oxygen sensor 2 has a much longer switching time between rich and lean than the air fuel ratio (A/F) sensor 1. The oxygen storage capacity of the three way catalyst 1 causes the longer switching time. To judge the malfunctions of heated oxygen sensor 2, ECM monitors whether the switching response of the sensor's voltage is faster than specified during various driving conditions such as fuel cut.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	
P0139	Heated oxygen sensor 2 (bank 1) circuit slow response	It takes more time for the sensor to respond be-	 Harness or connectors (The sensor circuit is open or shorted) Heated oxygen sensor 2 	
P0159	Heated oxygen sensor 2 (bank 2) circuit slow response	tween rich and lean than the specified time.	Fuel pressureFuel injectorIntake air leaks	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

Will CONSULT-III be used?

YES >> GO TO 2.

NO >> GO TO 4.

2. PERFORM DTC CONFIRMATION PROCEDURE

(P)With CONSULT-III

TESTING CONDITION:

For better results, perform "DTC WORK SUPPORT" at a temperature of 0 to 30 °C (32 to 86 °F).

- 1. Start engine and warm it up to the normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.

EC

Α

D

Е

F

Н

.

_

M

IVI

Ν

0

- 3. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.
- 5. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- 6. Let engine idle for 1 minute.
- 7. Select "DATA MONITOR" mode with CONSULT-III.
- 8. Make sure that "COOLAN TEMP/S" indicates more than 70°C (158°F).

If not, warm up engine and go to next step when "COOLAN TEMP/S" indication reaches to 70°C (158°F).

- 9. Open engine hood.
- 10. Select "HO2S2 (B1) P0139" or "HO2S2 (B2) P0159" of "HO2S2" in "DTC WORK SUPPORT" mode with CONSULT-III.
- 11. Start engine and follow the instruction of CONSULT-III display.

NOTE:

It will take at most 10 minutes until "COMPLETED" is displayed.

12. Touch "SELF-DIAG RESULTS".

Which is displayed on CONSULT-III screen?

OK >> INSPECTION END

NG >> Go to EC-233, "Diagnosis Procedure".

CAN NOT BE DIAGNOSED>>GO TO 3.

3.perform dtc confirmation procedure again

- 1. Turn ignition switch OFF and leave the vehicle in a cool place (soak the vehicle).
- 2. Perform DTC confirmation procedure again.

>> GO TO 2.

4. PERFORM COMPONENT FUNCTION CHECK

Without CONSULT-III

Perform component function check. Refer to EC-232, "Component Function Check".

NOTE:

Use component function check to check the overall function of the heated oxygen sensor 2 circuit. During this check, a 1st trip DTC might not be confirmed.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-233, "Diagnosis Procedure".

Component Function Check

INFOID:0000000003856124

1.PERFORM COMPONENT FUNCTION CHECK-I

Without CONSULT-III

- 1. Start engine and warm it up to the normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- Let engine idle for 1 minute.
- Check the voltage between ECM harness connector terminals under the following condition.

	ECM					
DTC	Connector	+	_	Condition	Voltage	
	Connector	Terminal	Terminal			
P0139	F102	76	84	Revving up to 4,000 rpm under no load at	A change of voltage should be more than 0.24 V for 1 second during this procedure.	
P0159	1 102	80	04	least 10 times		

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.PERFORM COMPONENT FUNCTION CHECK-II

[VQ35HR]

Check the voltage between ECM harness connector terminals under the following condition.

		ECM			
DTC	DTC Connector + - Condition Terminal Terminal		Voltage		
			Terminal		
P0139	F102	76	84	Keeping engine at idle for 10 minutes	A change of voltage should be more than
P0159	1102	80	04	Reeping engine at late for 10 minutes	0.24 V for 1 second during this procedure.

Is the inspection result normal?

>> INSPECTION END

NO >> GO TO 3.

3 Perform component function check-iii

Check the voltage between ECM harness connector terminals under the following condition.

		ECM	М			
DTC	Connector	+	_	Condition	Voltage	
Connector	Terminal	Terminal				
P0139	F102	76	84	Coasting from 80 km/h (50 MPH) in D po-		
P0159	80		04	sition	0.24 V for 1 second during this procedure.	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-233, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003856125

1. CHECK GROUND CONNECTION

- Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CLEAR THE MIXTURE RATIO SELF-LEARNING VALUE

- Clear the mixture ratio self-learning value. Refer to EC-28, "MIXTURE RATIO SELF-LEARNING VALUE CLEAR: Special Repair Requirement".
- Run engine for at least 10 minutes at idle speed.

Is the 1st trip DTC P0171, P0172, P0174 or P0175 detected? Is it difficult to start engine?

>> Perform trouble diagnosis for DTC P0171, P0174 or P0172, P0175. Refer to EC-237, "DTC Logic" YES or EC-241, "DTC Logic".

NO >> GO TO 3.

3.check heated oxygen sensor 2 (ho2s2) ground circuit for open and short

- Turn ignition switch OFF.
- 2. Disconnect HO2S2 harness connector.
- Disconnect ECM harness connector.
- Check the continuity between HO2S2 harness connector and ECM harness connector.

DTC		HO2S2		EC	Continuity	
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0139	1	F54	1	F102	84	Existed
P0159	2	F53	1	1 102	F102 64	EXISTECT

Also check harness for short to ground and short to power.

EC-233 Revision: 2009 March 2009 FX35/FX50

Α

EC

D

Е

F

Н

K

M

Ν

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

4.CHECK HO2S2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between HO2S2 harness connector and ECM harness connector.

DTC		HO2S2		EC	Continuity	
ыс	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0139	1	F54	4	F102	76	Existed
P0159	2	F53	4	1 102	80	LAISIEU

2. Check the continuity between HO2S2 harness connector or ECM harness connector and ground.

DTC	HO2S2			ECM		Ground	Continuity
ыс	Bank	Connector	Terminal	Connector	Terminal	Ground	Continuity
P0139	1	F54	4	F102	76	Ground	Not existed
P0159	2	F53	4	F102	80	Giouria	INUL EXISTED

3. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

5. CHECK HEATED OXYGEN SENSOR 2

Refer to EC-234, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 6.

6.REPLACE HEATED OXYGEN SENSOR 2

Replace malfunctioning heated oxygen sensor 2.

CAUTION:

- Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J-43897-12)] and approved anti-seize lubricant (commercial service tool).

>> INSPECTION END

7. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident",

>> INSPECTION END

Component Inspection

INFOID:0000000004157675

1. INSPECTION START

Will CONSULT-III be used?

Will CONSULT-III be used?

YES >> GO TO 2.

NO >> GO TO 3.

2.CHECK HEATED OXYGEN SENSOR 2 (HO2S2)

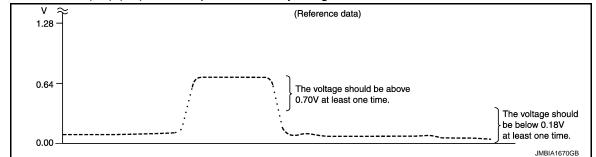
(II) With CONSULT-III

P0139, P0159 HO2S2

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

- 1. Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-III.
- 2. Start engine and warm it up to the normal operating temperature.
- 3. Turn ignition switch OFF and wait at least 10 seconds.
- 4. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- Let engine idle for 1 minute.
- 6. Select "FUEL INJECTION" in "ACTIVE TEST" mode, and select "HO2S2 (B1)/(B2)" as the monitor item with CONSULT-III.
- 7. Check "HO2S2 (B1)/(B2)" at idle speed when adjusting "FUEL INJECTION" to ±25%.



"HO2S2 (B1)/(B2)" should be above 0.70 V at least once when the "FUEL INJECTION" is +25%. "HO2S2 (B1)/(B2)" should be below 0.18 V at least once when the "FUEL INJECTION" is -25%.

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 6.

3. CHECK HEATED OXYGEN SENSOR 2-1

Without CONSULT-III

- 1. Start engine and warm it up to the normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- 4. Let engine idle for 1 minute.
- 5. Check the voltage between ECM harness connector terminals under the following condition.

	ECM				
Connector	+ -		Condition	Voltage	
Connector	Terminal	Terminal			
F102	76 [HO2S2 (bank 1)]	84	Revving up to 4,000 rpm under no load at least 10 times	The voltage should be above 0.70 V at least once during this procedure.	
F102 –	80 [HO2S2 (bank 2)]			The voltage should be below 0.18 V at least once during this procedure.	

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 4.

4. CHECK HEATED OXYGEN SENSOR 2-II

Check the voltage between ECM harness connector terminals under the following condition.

Α

EC

D

Е

F

Н

J

K

M

Ν

Ρ

	ECM				
Connector	+ -		Condition	Voltage	
Connector	Terminal	Terminal			
F102	76 [HO2S2 (bank 1)]	- 84	Keeping engine at idle for 10 minutes	The voltage should be above 0.70 V at least once during this procedure.	
	80 [HO2S2 (bank 2)]			The voltage should be below 0.18 V at least once during this procedure.	

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 5.

5. CHECK HEATED OXYGEN SENSOR 2-III

Check the voltage between ECM harness connector terminals under the following condition.

	ECM			
Connector	+ -		Condition	Voltage
Connector	Terminal	Terminal		
E102	76 [HO2S2 (bank 1)]	- 84	Coasting from 80 km/h (50 MPH) in D position	The voltage should be above 0.70 V at least once during this procedure. The voltage should be below 0.18 V at least once during this procedure.
F102 -	80 [HO2S2 (bank 2)]			

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 6.

6. REPLACE HEATED OXYGEN SENSOR 2

Replace malfunctioning heated oxygen sensor 2.

CAUTION:

- Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J-43897-12)] and approved anti-seize lubricant (commercial service tool).

>> INSPECTION END

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

P0171, P0174 FUEL INJECTION SYSTEM FUNCTION

DTC Logic INFOID:0000000003856127

DTC DETECTION LOGIC

With the Air/Fuel Mixture Ratio Self-Learning Control, the actual mixture ratio can be brought closely to the theoretical mixture ratio based on the mixture ratio feedback signal from air fuel ratio (A/F) sensor 1. The ECM calculates the necessary compensation to correct the offset between the actual and the theoretical ratios. In case the amount of the compensation value is extremely large (the actual mixture ratio is too lean), the ECM judges the condition as the fuel injection system malfunction and illuminates the MIL (2 trip detection logic).

Sensor	Input signal to ECM	ECM function	Actuator
A/F sensor 1	Density of oxygen in exhaust gas (Mixture ratio feedback signal)	Fuel injection control	Fuel injector

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	
P0171	Fuel injection system too lean (bank 1)		Intake air leaksA/F sensor 1	A/F sensor 1
P0174	Fuel injection system too lean (bank 2)	Fuel injection system does not operate properly. The amount of mixture ratio compensation is too large. (The mixture ratio is too lean.)	 Fuel injector Exhaust gas leaks Incorrect fuel pressure Lack of fuel Mass air flow sensor Incorrect PCV hose connection 	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE-I

- Clear the mixture ratio self-learning value. Refer to EC-28, "MIXTURE RATIO SELF-LEARNING VALUE CLEAR: Special Repair Requirement".
- Start engine.

Is it difficult to start engine?

YES >> GO TO 3.

NO >> GO TO 4.

3.restart engine

If it is difficult to start engine, the fuel injection system has a malfunction, too.

Crank engine while depressing accelerator pedal.

Does engine start?

YES >> Go to EC-238, "Diagnosis Procedure".

NO >> Check exhaust and intake air leak visually.

4. PERFORM DTC CONFIRMATION PROCEDURE-II

- Keep engine idle for at least 5 minutes.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-238, "Diagnosis Procedure".

NO >> GO TO 5.

EC-237 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

Н

K

N

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

5.PERFORM DTC CONFIRMATION PROCEDURE-III

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.
- Start engine.
- Maintain the following conditions for at least 10 consecutive minutes. Hold the accelerator pedal as steady as possible.

VHCL SPEED SE	50 - 120 km/h (31 - 75 mph)
---------------	-----------------------------

CAUTION:

Always drive vehicle at a safe speed.

6. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-238, "Diagnosis Procedure".

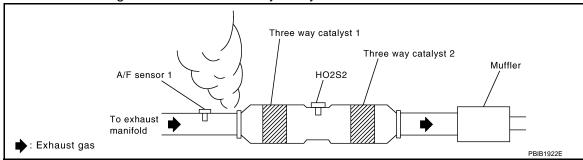
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003856128

1. CHECK EXHAUST GAS LEAK

- Start engine and run it at idle.
- Listen for an exhaust gas leak before three way catalyst 1.



Is exhaust gas leak detected?

YES >> Repair or replace malfunctioning part.

NO >> GO TO 2.

2.CHECK FOR INTAKE AIR LEAK

- Listen for an intake air leak after the mass air flow sensor.
- Check PCV hose connection.

Is intake air leak detected?

YES >> Repair or replace malfunctioning part.

NO >> GO TO 3.

3.check air fuel ratio (a/f) sensor 1 input signal circuit

- 1. Turn ignition switch OFF.
- Disconnect corresponding A/F sensor 1 harness connector.
- 3. Disconnect ECM harness connector.
- Check the continuity between A/F sensor 1 harness connector and ECM harness connector.

DTC		A/F sensor	1	EC	CM	Continuity
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0171	1	F3	1		57	
FUITI	P01/1 1	13	2	F102	61	Existed
D017/	2	E20	1	F102	65	Existed
F0174	P0174 2 F20	2		66		

5. Check the continuity between A/F sensor 1 harness connector or ECM harness connector and ground.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

DTC	A/F sensor 1		ECM		Ground	Continuity	
DIC	Bank	Connector	Terminal	Connector	Terminal	Giodila	Continuity
P0171	1	F3	1		57		
FUITI	70171	13	2	F102	61	Ground	Not existed
D0174	2	E20	1	1 102	65	Giodila	NOI EXISTED
	P0174 2	F20	2		66		

EC

Α

.0

Е

F

Н

Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

4. CHECK FUEL PRESSURE

Check fuel pressure. Refer to EC-567, "Inspection".

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 5.

$5.\,$ DETECT MALFUNCTIONING PART

Check fuel hoses and fuel tubes for clogging.

Is the inspection result normal?

YES >> Replace "fuel filter and fuel pump assembly".

NO >> Repair or replace malfunctioning part.

6. CHECK MASS AIR FLOW SENSOR

(P)With CONSULT-III

Install all removed parts.

2. Check "MASS AIR FLOW" in "DATA MONITOR" mode with CONSULT-III. For specification, refer to <u>EC-572</u>, "Mass Air Flow Sensor".

With GST

- 1. Install all removed parts.
- Check mass air flow sensor signal in Service \$01 with GST. For specification, refer to EC-572, "Mass Air Flow Sensor".

K

Is the measurement value within the specification?

YES >> GO TO 7.

NO >> Check connectors for rusted terminals or loose connections in the mass air flow sensor circuit or grounds. Refer to EC-178, "Diagnosis Procedure".

7. CHECK FUNCTION OF FUEL INJECTOR

M

Ν

Р

(I) With CONSULT-III

- 1. Start engine.
- 2. Perform "POWER BALANCE" in "ACTIVE TEST" mode with CONSULT-III.
- 3. Check that each circuit produces a momentary engine speed drop.

Without CONSULT-III

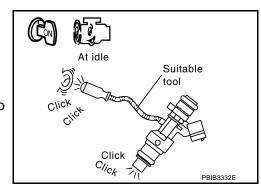
- 1. Start engine and let it idle.
- Listen to each fuel injector operating sound.

Clicking sound should be heard.

Is the inspection result normal?

YES >> GO TO 8.

NO >> Perform trouble diagnosis for FUEL INJECTOR, refer to EC-472, "Diagnosis Procedure".



Revision: 2009 March **EC-239** 2009 FX35/FX50

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

8. CHECK FUEL INJECTOR

- 1. Turn ignition switch OFF.
- 2. Confirm that the engine is cooled down and there are no fire hazards near the vehicle.
- 3. Disconnect all fuel injector harness connectors.
- Remove fuel tube assembly. Refer to <u>EM-40</u>. "<u>Removal and Installation</u>".
 Keep fuel hose and all fuel injectors connected to fuel tube.
- For DTC P0171, reconnect fuel injector harness connectors on bank 1.
 For DTC P0174, reconnect fuel injector harness connectors on bank 2.
- 6. Disconnect all ignition coil harness connectors.
- 7. Prepare pans or saucers under each fuel injector.
- Crank engine for approximately 3 seconds.
 For DTC P0171, check that fuel sprays out from fuel injectors on hank 1

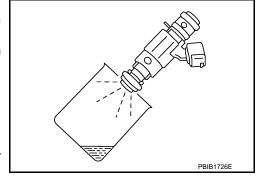
For DTC P0174, check that fuel sprays out from fuel injectors on bank 2.



Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace fuel injectors from which fuel does not spray out. Always replace O-ring with new ones.



9. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

P0172, P0175 FUEL INJECTION SYSTEM FUNCTION

DTC Logic INFOID:0000000003856129

DTC DETECTION LOGIC

With the Air/Fuel Mixture Ratio Self-Learning Control, the actual mixture ratio can be brought closely to the theoretical mixture ratio based on the mixture ratio feedback signal from air fuel ratio (A/F) sensor 1. The ECM calculates the necessary compensation to correct the offset between the actual and the theoretical ratios. In case the amount of the compensation value is extremely large (the actual mixture ratio is too rich), the ECM judges the condition as the fuel injection system malfunction and illuminates the MIL (2 trip detection logic).

Sensor	Input signal to ECM	ECM function	Actuator	
A/F sensor 1	Density of oxygen in exhaust gas (Mixture ratio feedback signal)	Fuel injection control	Fuel injector	

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0172	Fuel injection system too rich (bank 1)	Fuel injection system does not operate properly.	
P0175	Fuel injection system too rich (bank 2)	The amount of mixture ratio compensation is too large. (The mixture ratio is too rich.)	Exhaust gas leaksIncorrect fuel pressureMass air flow sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE-I

- Clear the mixture ratio self-learning value. Refer to EC-28, "MIXTURE RATIO SELF-LEARNING VALUE CLEAR: Special Repair Requirement".
- Start engine.

Is it difficult to start engine?

YES >> GO TO 3.

NO >> GO TO 4.

3.restart engine

If it is difficult to start engine, the fuel injection system has a malfunction, too.

Crank engine while depressing accelerator pedal.

Does engine start?

YES >> Go to EC-242, "Diagnosis Procedure".

NO >> Remove spark plugs and check for fouling, etc.

f 4.PERFORM DTC CONFIRMATION PROCEDURE-II

- Keep engine idle for at least 5 minutes.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-242, "Diagnosis Procedure".

NO >> GO TO 5.

${f 5.}$ PERFORM DTC CONFIRMATION PROCEDURE-III

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.

EC-241 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

F

Н

M

N

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

- Turn ignition switch OFF and wait at least 10 seconds.
- 4. Start engine.
- Maintain the following conditions for at least 10 consecutive minutes. Hold the accelerator pedal as steady as possible.

VHCL SPEED SE	50 – 120 km/h (31 – 75 mph)

CAUTION:

Always drive vehicle at a safe speed.

6. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-242, "Diagnosis Procedure".

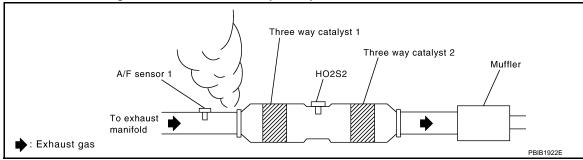
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003856130

1. CHECK EXHAUST GAS LEAK

- 1. Start engine and run it at idle.
- 2. Listen for an exhaust gas leak before three way catalyst 1.



Is exhaust gas leak detected?

YES >> Repair or replace malfunctioning part.

NO >> GO TO 2.

2.CHECK FOR INTAKE AIR LEAK

Listen for an intake air leak after the mass air flow sensor.

Is intake air leak detected?

YES >> Repair or replace malfunctioning part.

NO >> GO TO 3.

${\bf 3.}$ CHECK AIR FUEL RATIO (A/F) SENSOR 1 INPUT SIGNAL CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect corresponding A/F sensor 1 harness connector.
- 3. Disconnect ECM harness connector.
- Check the continuity between A/F sensor 1 harness connector and ECM harness connector.

DTC		A/F sensor 1		ECM		Continuity
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0172	1	F3	1		57	
10172	'	Г ГЗ	2 F102	61	Existed	
P0175	2	E20	1	1 102	65	LAISIEU
FU173	2 F20	2		66		

5. Check the continuity between A/F sensor 1 harness connector or ECM harness connector and ground.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

DTC			sensor 1 ECM		Ground	Continuity	
DIC	Bank	Connector	Terminal	Connector	Terminal	Giodila	Continuity
P0172	1	F3	1		57		
FU172	P0172 1	гэ	2	F102	61	Ground	Not existed
D0175	P0175 2 F20	1	F102	65	Giodila	Not existed	
FU175		F20	2		66		

EC

Α

F

K

N

Р

Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

4. CHECK FUEL PRESSURE

Check fuel pressure. Refer to EC-567, "Inspection".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace "fuel filter and fuel pump assembly".

${f 5.}$ CHECK MASS AIR FLOW SENSOR

(P)With CONSULT-III

- Install all removed parts.
- 2. Check "MASS AIR FLOW" in "DATA MONITOR" mode with CONSULT-III. For specification, refer to EC-572, "Mass Air Flow Sensor".

With GST

- 1. Install all removed parts.
- 2. Check mass air flow sensor signal in "Service \$01" with GST. For specification, refer to EC-572, "Mass Air Flow Sensor".

Is the measurement value within the specification?

YES >> GO TO 6.

NO >> Check connectors for rusted terminals or loose connections in the mass air flow sensor circuit or grounds. Refer to EC-178, "Diagnosis Procedure".

$oldsymbol{6}.$ CHECK FUNCTION OF FUEL INJECTOR

(II) With CONSULT-III

- 1. Start engine.
- 2. Perform "POWER BALANCE" in "ACTIVE TEST" mode with CONSULT-III.
- 3. Check that each circuit produces a momentary engine speed drop.

Without CONSULT-III

- 1. Start engine and let it idle.
- 2. Listen to each fuel injector operating sound.

Clicking sound should be heard.

Is the inspection result normal?

YES >> GO TO 7.

NO

>> Perform trouble diagnosis for FUEL INJECTOR, refer to EC-472, "Diagnosis Procedure".

At idle Suitable PBIB3332E

7. CHECK FUEL INJECTOR

- Remove fuel injector assembly. Refer to EM-40, "Removal and Installation". Keep fuel hose and all fuel injectors connected to fuel tube.
- Confirm that the engine is cooled down and there are no fire hazards near the vehicle.
- Disconnect all fuel injector harness connectors.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

- 4. Disconnect all ignition coil harness connectors.
- 5. Prepare pans or saucers under each fuel injector.
- 6. Crank engine for approximately 3 seconds. Check that fuel does not drip from fuel injector.

Is the inspection result normal?

YES >> GO TO 8.

NO >> Replace the fuel injectors from which fuel is dripping. Always replace O-ring with new one.

8. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

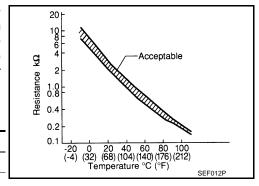
P0181 FTT SENSOR

Description INFOID:0000000003856131

The fuel tank temperature sensor is used to detect the fuel temperature inside the fuel tank. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the fuel temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.

<Reference data>

Fluid temperature [°C (°F)]	Voltage* (V)	Resistance (kΩ)
20 (68)	3.5	2.3 - 2.7
50 (122)	2.2	0.79 - 0.90



^{*:} These data are reference values and are measured between ECM terminals 106 (Fuel tank temperature sensor) and 128 (ECM ground).

DTC Logic INFOID:0000000003856132

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0181	Fuel tank temperature sensor circuit range/per-formance	Rationally incorrect voltage from the sensor is sent to ECM, compared with the voltage signals from engine coolant temperature sensor and intake air temperature sensor.	Harness or connectors (The sensor circuit is open or shorted) Fuel tank temperature sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds. 1.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE-I

- Turn ignition switch ON and wait at least 10 seconds.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-246, "Diagnosis Procedure".

NO >> GO TO 3.

3.CHECK ENGINE COOLANT TEMPERATURE

(P)With CONSULT-III

- Select "COOLAN TEMP/S" in "DATA MONITOR" with CONSULT-III.
- Check "COOLAN TEMP/S" value.

■With GST

Follow the procedure "With CONSULT-III" above.

"COOLAN TEMP/S" less than 60°C (140°F)?

>> INSPECTION END YES

NO >> GO TO 4.

f 4 . PERFORM DTC CONFIRMATION PROCEDURE-II

EC

Α

D

Е

F

K

Ν

Р

2009 FX35/FX50

P0181 FTT SENSOR

< DTC/CIRCUIT DIAGNOSIS > [VQ35HR]

(P)With CONSULT-III

- 1. Cool engine down until "COOLAN TEMP/S" is less than 60°C (140°F).
- 2. Wait at least 10 seconds.
- Check 1st trip DTC.

With GST

Follow the procedure "With CONSULT-III" above.

Is 1st trip DTC detected?

YES >> Go to EC-246, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003856133

1. CHECK GROUND CONNECTION

- Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK DTC WITH "UNIFIED METER AND A/C AMP."

Refer to MWI-45, "CONSULT-III Function (METER/M&A)".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Go to MWI-62, "Component Function Check".

${f 3.}$ CHECK FUEL TANK TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect "fuel level sensor unit and fuel pump (main)" harness connector.
- 3. Turn ignition switch ON.
- 4. Check the voltage between "fuel level sensor unit and fuel pump (main)" harness connector and ground.

Fuel level sensor unit and fuel pump (main)		Ground	Voltage (V)
Connector	Terminal		
B22	4	Ground	Approx. 5

Is the inspection result normal?

YES >> GO TO 5. NO >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M7, B1
- Harness for open or short between ECM and "fuel level sensor unit and fuel pump (main)"

>> Repair open circuit, short to ground or short to power in harness or connector.

5.CHECK FUEL TANK TEMPERATURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect "unified meter and A/C amp." harness connector.
- Check the continuity between "fuel level sensor unit and fuel pump (main)" harness connector and "unified meter and A/C amp." harness connector.

	Fuel level sensor unit and fuel pump (main)		Unified meter and A/C amp.	
Connector	Terminal	Connector	Terminal	
B22	5	M67	58	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M7, B1
- Harness for open or short between "fuel level sensor unit and fuel pump (main)" and "unified meter and A/C amp."

>> Repair open circuit, short to ground or short to power in harness or connector.

7. CHECK FUEL TANK TEMPERATURE SENSOR

Refer to EC-247, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 8.

NO >> Replace "fuel level sensor unit and fuel pump (main)".

8. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

1. CHECK FUEL TANK TEMPERATURE SENSOR

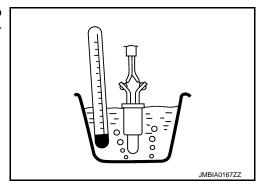
- Turn ignition switch OFF.
- 2. Disconnect "fuel level sensor unit and fuel pump (main)" harness connector.
- 3. Remove fuel level sensor unit.
- Check resistance between "fuel level sensor unit and fuel pump (main)" terminals by heating with hot water as shown in the figure.

Terminals	Condition		Resistance (kΩ)
4 and 5	Temperature [°C	20 (68)	2.3 - 2.7
	(°F)]	50 (122)	0.79 - 0.90

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace "fuel level sensor unit and fuel pump (main)".



EC

Α

D

F

Н

I

INFOID:0000000003856134

K

L

M

N

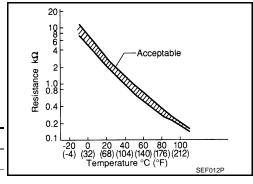
P0182, P0183 FTT SENSOR

Description INFOID:000000004117386

The fuel tank temperature sensor is used to detect the fuel temperature inside the fuel tank. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the fuel temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.

<Reference data>

Fluid temperature [°C (°F)]	Voltage* (V)	Resistance (kΩ)
20 (68)	3.5	2.3 - 2.7
50 (122)	2.2	0.79 - 0.90



^{*:} These data are reference values and are measured between ECM terminals 106 (Fuel tank temperature sensor) and 128 (ECM ground).

DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0182	Fuel tank temperature sensor circuit low input	An excessively low voltage from the sensor is sent to ECM.	Harness or connectors (The sensor circuit is open or shorted.)
P0183	Fuel tank temperature sensor circuit high input	An excessively high voltage from the sensor is sent to ECM.	Fuel tank temperature sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- Turn ignition switch ON and wait at least 5 seconds.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-248, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003856137

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- 2. Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK DTC WITH "UNIFIED METER AND A/C AMP."

Refer to MWI-45, "CONSULT-III Function (METER/M&A)".

P0182, P0183 FTT SENSOR [VQ35HR] < DTC/CIRCUIT DIAGNOSIS > Is the inspection result normal? Α YES >> GO TO 3. NO >> Go to MWI-62, "Component Function Check". 3.check fuel tank temperature sensor power supply circuit EC Turn ignition switch OFF. Disconnect "fuel level sensor unit and fuel pump (main)" harness connector. 2. 3. Turn ignition switch ON. 4. Check the voltage between "fuel level sensor unit and fuel pump (main)" harness connector and ground. Fuel level sensor unit and fuel D pump (main) Ground Voltage (V) Connector **Terminal** B22 4 Ground Approx. 5 Е Is the inspection result normal? YES >> GO TO 5. NO >> GO TO 4. **4.**DETECT MALFUNCTIONING PART Check the following. Harness connectors M7, B1 Harness for open or short between ECM and "fuel level sensor unit and fuel pump (main)" Н >> Repair open circuit, short to ground or short to power in harness or connector. ${f 5.}$ CHECK FUEL TANK TEMPERATURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT Turn ignition switch OFF. Disconnect "unified meter and A/C amp." harness connector. Check the continuity between "fuel level sensor unit and fuel pump (main)" harness connector and "unified meter and A/C amp." harness connector. Fuel level sensor unit and Unified meter and A/C fuel pump (main) amp. Continuity Terminal Connector Connector **Terminal** B22 5 M67 58 **Existed** Also check harness for short to ground and short to power. Is the inspection result normal? YES >> GO TO 7. NO >> GO TO 6. M 6.DETECT MALFUNCTIONING PART Check the following. N Harness connectors M7, B1 Harness for open or short between "fuel level sensor unit and fuel pump" and "unified meter and A/C amp." >> Repair open circuit, short to ground or short to power in harness or connector. .CHECK FUEL TANK TEMPERATURE SENSOR Refer to EC-250, "Component Inspection". Is the inspection result normal?

YES >> GO TO 8.

NO >> Replace "fuel level sensor unit and fuel pump (main)".

8. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

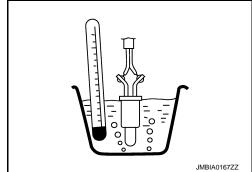
Component Inspection

INFOID:0000000004117387

1. CHECK FUEL TANK TEMPERATURE SENSOR

- 1. Turn ignition switch OFF.
- 2. Disconnect "fuel level sensor unit and fuel pump (main)" harness connector.
- 3. Remove fuel level sensor unit.
- 4. Check resistance between "fuel level sensor unit and fuel pump (main)" terminals by heating with hot water as shown in the figure.

Terminals	Condition		Resistance (k Ω)
4 and 5	Temperature [°C	20 (68)	2.3 - 2.7
	(°F)]	50 (122)	0.79 - 0.90



Is the inspection result normal?

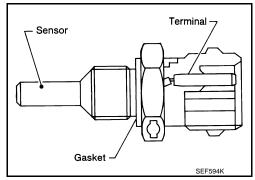
YES >> INSPECTION END

NO >> Replace "fuel level sensor unit and fuel pump (main)".

P0196 EOT SENSOR

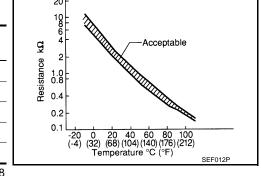
Description INFOID:0000000003856139

The engine oil temperature sensor is used to detect the engine oil temperature. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the engine oil temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.



<Reference data>

Engine oil temperature [°C (°F)]	Voltage* (V)	Resistance (kΩ)
-10 (14)	4.4	7.0 - 11.4
20 (68)	3.5	2.1 - 2.9
50 (122)	2.2	0.68 - 1.00
90 (194)	0.9	0.236 - 0.260
110 (230)	0.6	0.143 - 0.153



^{*:} These data are reference values and are measured between ECM terminals 78 (Engine oil temperature sensor) and 84 (Sensor ground).

DTC Logic INFOID:0000000003856140

DTC DETECTION LOGIC

If DTC P0196 is displayed with P0197 or P0198, first perform the trouble diagnosis for DTC P0197, P0198. Refer to EC-254, "DTC Logic".

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0196	Engine oil temperature sensor range/perfor- mance	Rationally incorrect voltage from the sensor is sent to ECM, compared with the voltage signals from engine coolant temperature sensor and intake air temperature sensor.	Harness or connectors (The sensor circuit is open or shorted) Engine oil temperature sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 11 V at idle.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE-I

- Start engine and warm it up to normal operating temperature.
- Turn ignition switch OFF and wait at least 10 seconds.

EC-251 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

L

M

N

- 3. Turn ignition switch ON.
- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Start engine and let it idle for 5 minutes and 10 seconds.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> EC-252, "Diagnosis Procedure".

NO >> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE-II

(P)With CONSULT-III

- Select "DATA MONITOR" mode with CONSULT-III.
- Check that "COOLAN TEMP/S" indicates above 80°C (176°F).

If it is above 80°C (176°F), go to the following steps.

If it is below 80°C (176°F), warm engine up until "COOLAN TEMP/S" indicates more than 80°C (176°F). Then perform the following steps.

- 3. Turn ignition switch OFF and soak the vehicle in a cool place.
- 4. Turn ignition switch ON.

NOTE:

Do not turn ignition switch OFF until step 8.

- 5. Select "DATA MONITOR" mode with CONSULT-III.
- 6. Check the following.

COOLAN TEMP/S	Below 40°C (104°F)
INT/A TEMP SE	Below 40°C (104°F)
Difference between "COOLAN TEMP/S" and "INT/A TEMP SE"	Within 6°C (11°F)

If they are within the specified range, perform the following steps.

If they are out of the specified range, soak the vehicle to meet the above conditions. Then perform the following steps.

NOTĚ:

- Do not turn ignition switch OFF.
- If it is supposed to need a long period of time, do not deplete the battery.
- 7. Start engine and let it idle for 5 minutes.
- Check 1st trip DTC.

With GST

Follow the procedure "With CONSULT-III" above.

Is 1st trip DTC detected?

YES >> EC-252, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003856141

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- 2. Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.check engine oil temperature sensor

Refer to EC-253. "Component Inspection".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace engine oil temperature sensor.

3.check intermittent incident

Refer to GI-35, "Intermittent Incident".

P0196 EOT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

>> INSPECTION END

Component Inspection

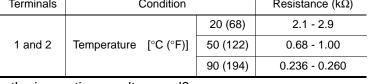
INFOID:0000000003856142

[VQ35HR]

1.CHECK ENGINE OIL TEMPERATURE SENSOR

- Turn ignition switch OFF.
- 2. Disconnect engine oil temperature sensor harness connector.
- 3. Remove engine oil temperature sensor.
- 4. Check resistance between engine oil temperature sensor terminals by heating with hot water as shown in the figure.

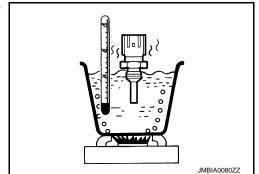
Terminals	Condition	Resistance (kΩ)	
		20 (68)	2.1 - 2.9
1 and 2	Temperature [°C (°F)]	50 (122)	0.68 - 1.00
		90 (194)	0.236 - 0.260





YES >> INSPECTION END

NO >> Replace engine oil temperature sensor.



EC

Α

D

Е

F

Н

K

M

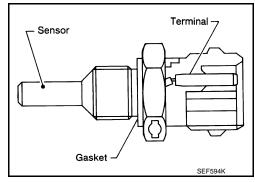
Ν

0

P0197, P0198 EOT SENSOR

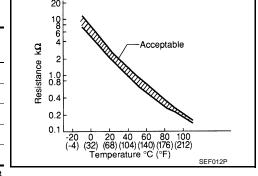
Description INFOID:000000003856143

The engine oil temperature sensor is used to detect the engine oil temperature. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the engine oil temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.



<Reference data>

Engine oil temperature [°C (°F)]	Voltage* (V)	Resistance (kΩ)
-10 (14)	4.4	7.0 - 11.4
20 (68)	3.5	2.1 - 2.9
50 (122)	2.2	0.68 - 1.00
90 (194)	0.9	0.236 - 0.260
110 (230)	0.6	0.143 - 0.153



^{*:} These data are reference values and are measured between ECM terminals 78 (Engine oil temperature sensor) and 84 (Sensor ground).

DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble Diagnosis Name	DTC Detecting Condition	Possible Cause
P0197	Engine oil tempera- ture sensor circuit low input	An excessively low voltage from the sensor is sent to ECM.	Harness or connectors (The sensor circuit is open or shorted.)
P0198	Engine oil tempera- ture sensor circuit high input	An excessively high voltage from the sensor is sent to ECM.	Engine oil temperature sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- Start engine and wait at least 5 seconds.
- Check 1st trip DTC.

Is 1st trip DTC detected?

P0197, P0198 EOT SENSOR

[VQ35HR] < DTC/CIRCUIT DIAGNOSIS > YES >> Go to EC-255, "Diagnosis Procedure". NO >> INSPECTION END Α Diagnosis Procedure INFOID:0000000003856145 1. CHECK GROUND CONNECTION EC Turn ignition switch OFF. Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection". Is the inspection result normal? YES >> GO TO 2. NO >> Repair or replace ground connection. D 2.check engine oil temperature (eot) sensor power supply circuit Disconnect EOT sensor harness connector. Е Turn ignition switch ON. Check the voltage between EOT sensor harness connector and ground. EOT sensor Ground Voltage (V) Connector **Terminal** F38 Ground Approx. 5 Is the inspection result normal? YFS >> GO TO 3. NO >> Repair open circuit, short to ground or short to power in harness or connectors. Н ${f 3.}$ CHECK EOT SENSOR GROUND CIRCUIT FOR OPEN AND SHORT Turn ignition switch OFF. 2. Disconnect ECM harness connector. Check the continuity between EOT sensor harness connector and ECM harness connector. EOT sensor **ECM** Continuity Connector Terminal Connector **Terminal** F38 2 F102 84 Existed Also check harness for short to ground and short to power. Is the inspection result normal? YES >> GO TO 4. NO >> Repair open circuit, short to ground or short to power in harness or connectors. 4.CHECK EOT SENSOR Refer to EC-255, "Component Inspection". Is the inspection result normal? YES >> GO TO 5. N NO >> Replace engine oil temperature sensor. ${f 5}.$ CHECK INTERMITTENT INCIDENT Refer to GI-35, "Intermittent Incident". >> INSPECTION END Component Inspection INFOID:0000000003856146 ${f 1}$.CHECK ENGINE OIL TEMPERATURE SENSOR 1. Turn ignition switch OFF. 2. Disconnect engine oil temperature sensor harness connector.

Remove engine oil temperature sensor.

P0197, P0198 EOT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

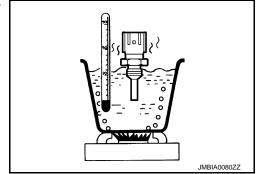
4. Check resistance between engine oil temperature sensor terminals by heating with hot water as shown in the figure.

Terminals	Condition	Resistance (kΩ)	
		20 (68)	2.1 - 2.9
1 and 2	Temperature [°C (°F)]	50 (122)	0.68 - 1.00
		90 (194)	0.236 - 0.260

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace engine oil temperature sensor.



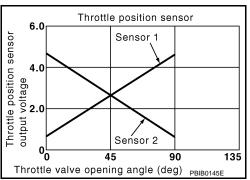
[VQ35HR]

P0222, P0223, P2132, P2133 TP SENSOR

Description INFOID:0000000003856147

Electric throttle control actuator consists of throttle control motor, throttle position (TP) sensor, etc. The throttle position sensor responds to the throttle valve movement.

The throttle position sensor has two sensors. These sensors are a kind of potentiometers which transform the throttle valve position into output voltage, and emit the voltage signal to the ECM. In addition, these sensors detect the opening and closing speed of the throttle valve and feed the voltage signals to the ECM. The ECM judges the current opening angle of the throttle valve from these signals and the ECM controls the throttle control motor to make the throttle valve opening angle properly in response to driving condition.



DTC Logic INFOID:0000000003856148

DTC DETECTION LOGIC

NOTE:

If DTC P0222, P0223, P2132 or P2133 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. Refer to EC-361, "DTC Logic".

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0222	Throttle position (TP) sensor 1 (bank 1) circuit low input	An excessively low voltage from the TP sensor 1 is sent to ECM.	
P0223	Throttle position (TP) sensor 1 (bank 1) circuit high input	An excessively high voltage from the TP sensor 1 is sent to ECM.	Harness or connectors (TP sensor 1 circuit is open or shorted.)
P2132	Throttle position (TP) sensor 1 (bank 2) circuit low input	An excessively low voltage from the TP sensor 1 is sent to ECM.	Electric throttle control actuator (TP sensor 1)
P2133	Throttle position (TP) sensor 1 (bank 2) circuit high input	An excessively high voltage from the TP sensor 1 is sent to ECM.	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10 V at idle.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- Start engine and let it idle for 1 second.
- Check DTC.

Is DTC detected?

>> Go to EC-258, "Diagnosis Procedure". YES

NO >> INSPECTION END

EC-257 Revision: 2009 March 2009 FX35/FX50

EC

Α

Е

F

Н

K

N

< DTC/CIRCUIT DIAGNOSIS >

Diagnosis Procedure

INFOID:0000000003856149

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK THROTTLE POSITION SENSOR 1 POWER SUPPLY CIRCUIT

- Disconnect electric throttle control actuator harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between electric throttle control actuator harness connector and ground.

DTC	Electr	Electric throttle control actuator			Voltage (V)
ыс	Bank	Connector	Terminal	Ground	voltage (v)
P0222, P0223	1	F6	6	Ground	Approx. 5
P2132, P2133	2	F27	1	Ground	дриох. 3

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

3. CHECK THROTTLE POSITION SENSOR 1 GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check the continuity between electric throttle control actuator harness connector and ECM harness connector.

DTC	Electri	c throttle cont	rol actuator	ECM		Continuity
ы	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0222, P0223	1	F6	3	F101	40	Existed
P2132, P2133	2	F27	4	FIUI	48	EXISTEC

^{4.} Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

4. CHECK THROTTLE POSITION SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

Check the continuity between electric throttle control actuator harness connector and ECM harness connector.

DTC	Electric throttle control actuator		ECM		Continuity	
DIO	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0222, P0223	1	F6	4	F101	30	Existed
P2132, P2133	2	F27	2	1 101	31	LAISIEU

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

${f 5.}$ CHECK THROTTLE POSITION SENSOR

Refer to EC-259, "Component Inspection".

P0222, P0223, P2132, P2133 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6.

6. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

- Replace malfunctioning electric throttle control actuator.
- Go to EC-259, "Special Repair Requirement".

>> INSPECTION END

7. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

1. CHECK THROTTLE POSITION (TP) SENSOR

- Turn ignition switch OFF.
- 2. Reconnect all harness connectors disconnected.
- Perform EC-25, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement".
- Turn ignition switch ON.
- 5. Set selector lever position to D.
- 6. Check the voltage between ECM harness connector terminals under the following conditions.

	ECM			
Connector	+	_	Condition	Voltage (V)
Connector	Terminal	Terminal		
	30	40	Accelerator pedal: Fully released	More than 0.36
	[TP sensor 1 (bank 1)]	40	Accelerator pedal: Fully depressed	Less than 4.75
•	31	48	Accelerator pedal: Fully released	More than 0.36
F101	[TP sensor 1 (bank 2)]	40	Accelerator pedal: Fully depressed	Less than 4.75
FIUI	34 [TP sensor 2 (bank 1)] 40	40	Accelerator pedal: Fully released	Less than 4.75
		40	Accelerator pedal: Fully depressed	More than 0.36
	35	48	Accelerator pedal: Fully released	Less than 4.75
	[TP sensor 2 (bank 2)]	40	Accelerator pedal: Fully depressed	More than 0.36

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.replace electric throttle control actuator

- Replace malfunctioning electric throttle control actuator.
- Go to EC-259, "Special Repair Requirement".

>> INSPECTION END

Special Repair Requirement

1. PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Refer to EC-25, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement"

>> GO TO 2.

2.PERFORM IDLE AIR VOLUME LEARNING

EC-259 Revision: 2009 March 2009 FX35/FX50

Α

[VQ35HR]

EC

Е

INFOID:0000000003856150

Н

Ν

INFOID:0000000003856151

P0222, P0223, P2132, P2133 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Refer to EC-25, "IDLE AIR VOLUME LEARNING: Special Repair Requirement"

>> END

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

P0300, P0301, P0302, P0303, P0304, P0305, P0306 MISFIRE

DTC Logic

DTC DETECTION LOGIC

When a misfire occurs, engine speed will fluctuate. If the engine speed fluctuates enough to cause the crank-shaft position (CKP) sensor signal to vary, ECM can determine that a misfire is occurring.

Sensor	Input signal to ECM	ECM function
CKP sensor	Engine speed	On board diagnosis of misfire

The misfire detection logic consists of the following two conditions.

1. One Trip Detection Logic (Three Way Catalyst Damage)

On the 1st trip when a misfire condition occurs that can damage the three way catalyst (TWC) due to overheating, the MIL will blink.

When a misfire condition occurs, the ECM monitors the CKP sensor signal every 200 engine revolutions for a change.

When the misfire condition decreases to a level that will not damage the TWC, the MIL will turn off. If another misfire condition occurs that can damage the TWC on a second trip, the MIL will blink. When the misfire condition decreases to a level that will not damage the TWC, the MIL will remain on. If another misfire condition occurs that can damage the TWC, the MIL will begin to blink again.

2. Two Trip Detection Logic (Exhaust quality deterioration)

For misfire conditions that will not damage the TWC (but will affect vehicle emissions), the MIL will only light when the misfire is detected on a second trip. During this condition, the ECM monitors the CKP sensor signal every 1,000 engine revolutions.

A misfire malfunction can be detected in any one cylinder or in multiple cylinders.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0300	Multiple cylinder misfires detected	Multiple cylinder misfire.	Improper spark plug
P0301	No.1 cylinder misfire detected	No. 1 cylinder misfires.	Insufficient compression Incorrect fuel pressure
P0302	No. 2 cylinder misfire detected	No. 2 cylinder misfires.	The fuel injector circuit is open or shorted
P0303	No. 3 cylinder misfire detected	No. 3 cylinder misfires.	Fuel injector Intake air leak
P0304	No. 4 cylinder misfire detected	No. 4 cylinder misfires.	The ignition signal circuit is open or short-
P0305	No. 5 cylinder misfire detected	No. 5 cylinder misfires.	ed • Lack of fuel
P0306	No. 6 cylinder misfire detected	No. 6 cylinder misfires.	 Signal plate Air fuel ratio (A/F) sensor 1 Incorrect PCV hose connection

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE-I

- 1. Start engine and warm it up to normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Turn ignition switch ON.
- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Restart engine and let it idle for approximately 15 minutes.
- 6. Check 1st trip DTC.

EC

Α

.

D

Е

F

.

Н

K

Ν

0

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Is 1st trip DTC detected?

YES >> Go to EC-262, "Diagnosis Procedure".

NO >> GO TO 3.

${f 3.}$ PERFORM DTC CONFIRMATION PROCEDURE-II

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.
- 4. Start engine and drive the vehicle under similar conditions to (1st trip) Freeze Frame Data for a certain time. Refer to the table below.

Hold the accelerator pedal as steady as possible.

Similar conditions to (1st trip) Freeze Frame Data mean that the following conditions should be satisfied at the same time.

CAUTION:

Always drive vehicle in safe manner according to traffic conditions and obey all traffic laws when driving.

Engine speed	Engine speed in the freeze frame data \pm 400 rpm
Vehicle speed	Vehicle speed in the freeze frame data \pm 10 km/h (6 MPH)
Basic fuel schedule	Basic fuel schedule in freeze frame data \times (1 \pm 0.1)
Engine coolant temperature (T) condition	When the freeze frame data shows lower than 70 °C (158 °F), T should be lower than 70 °C (158 °F).
	When the freeze frame data shows higher than or equal to 70 °C (158 °F), T should be higher than or equal to 70 °C (158 °F).

Driving time varies according to the engine speed in the freeze frame data.

Engine speed	Time
Around 1,000 rpm	Approx. 10 minutes
Around 2,000 rpm	Approx. 5 minutes
More than 3,000 rpm	Approx. 3.5 minutes

5. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-262, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003856153

1. CHECK FOR INTAKE AIR LEAK AND PCV HOSE

- Start engine and run it at idle speed.
- 2. Listen for the sound of the intake air leak.
- 3. Check PCV hose connection.

Is intake air leak detected?

YES >> Discover air leak location and repair.

NO >> GO TO 2.

2.CHECK FOR EXHAUST SYSTEM CLOGGING

Stop engine and visually check exhaust tube, three way catalyst and muffler for dents.

Is the inspection result normal?

YES-1 >> With CONSULT-III: GO TO 3.

YES-2 >> Without CONSULT-III: GO TO 4.

NO >> Repair or replace malfunctioning part.

3. PERFORM POWER BALANCE TEST

(II) With CONSULT-III

Start engine.

< DTC/CIRCUIT DIAGNOSIS >

- Perform "POWER BALANCE" in "ACTIVE TEST" mode with CONSULT-III.
- Check that each circuit produces a momentary engine speed drop.

Is the inspection result normal?

YES >> GO TO 9. NO >> GO TO 4.

4. CHECK FUNCTION OF FUEL INJECTOR

- Start engine and let it idle.
- Listen to each fuel injector operation.

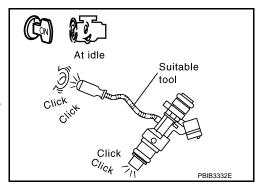
Clicking sound should be heard.

Is the inspection result normal?

YES >> GO TO 5.

NO

>> Perform trouble diagnosis for FUEL INJECTOR, refer to EC-472, "Diagnosis Procedure".



5.CHECK FUNCTION OF IGNITION COIL-I

CAUTION:

Perform the following procedure in a place with no combustible objects and good ventilation.

Turn ignition switch OFF.

2. Remove fuel pump fuse (1) in IPDM E/R (2) to release fuel pressure.

NOTE:

Do not use CONSULT-III to release fuel pressure, or fuel pressure applies again during the following procedure.

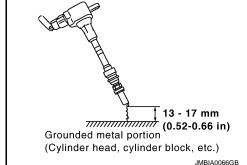
Start engine.

- 4. After engine stalls, crank it 2 or 3 times to release all fuel pressure.
- Turn ignition switch OFF.
- 6. Remove all ignition coil harness connectors to avoid the electrical discharge from the ignition coils.
- 7. Remove ignition coil and spark plug of the cylinder to be checked.
- 8. Crank engine for 5 seconds or more to remove combustion gas in the cylinder.
- 9. Connect spark plug and harness connector to ignition coil.
- 10. Fix ignition coil using a rope etc. with gap of 13 17 mm (0.52 -0.66 in) between the edge of the spark plug and grounded metal portion as shown in the figure.
- 11. Crank engine for approximately 3 seconds, and check whether spark is generated between the spark plug and the grounded metal portion.

Spark should be generated.

CAUTION:

 Never place to the spark plug and the ignition coil within 50 cm (19.7 in). Be careful not to get an electrical shock while checking, because the electrical discharge voltage becomes 20 kV or more.



• It might damage the ignition coil if the gap of more than 17 mm (0.66 in) is made. NOTE:

When the gap is less than 13 mm (0.52 in), a spark might be generated even if the coil is malfunctioning.

Is the inspection result normal?

YES >> GO TO 9. NO >> GO TO 6.

EC-263 Revision: 2009 March 2009 FX35/FX50

EC

Α

[VQ35HR]

D

Е

Н

K

JMBIA1506ZZ

M

N

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

6. CHECK FUNCTION OF IGNITION COIL-II

- 1. Turn ignition switch OFF.
- 2. Disconnect spark plug and connect a known-good spark plug.
- 3. Crank engine for approximately 3 seconds, and recheck whether spark is generated between the spark plug and the grounded metal portion.

Spark should be generated.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Check ignition coil, power transistor and their circuits. Refer to EC-482, "Diagnosis Procedure".

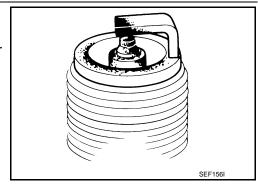
7. CHECK SPARK PLUG

Check the initial spark plug for fouling, etc.

Is the inspection result normal?

YES >> Replace spark plug(s) with standard type one(s). For spark plug type, refer to EM-143, "Spark Plug".

NO >> Repair or clean spark plug. Then GO TO 8.



8. CHECK FUNCTION OF IGNITION COIL-III

- 1. Reconnect the initial spark plugs.
- 2. Crank engine for approximately 3 seconds, and recheck whether spark is generated between the spark plug and the grounded portion.

Spark should be generated.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace spark plug(s) with standard type one(s). For spark plug type, refer to EM-143, "Spark Plug".

9. CHECK COMPRESSION PRESSURE

Check compression pressure. Refer to EM-25, "Inspection".

Is the inspection result normal?

YES >> GO TO 10.

NO >> Check pistons, piston rings, valves, valve seats and cylinder head gaskets.

10. CHECK FUEL PRESSURE

- Install all removed parts.
- Check fuel pressure. Refer to <u>EC-567</u>, "Inspection".

Is the inspection result normal?

YES >> GO TO 12.

NO >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check fuel hoses and fuel tubes for clogging.

Is the inspection result normal?

YES >> Replace "fuel filter and fuel pump assembly".

NO >> Repair or replace malfunctioning part.

12.CHECK IDLE SPEED AND IGNITION TIMING

Check idle speed and ignition timing.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

For procedure, refer to EC-20, "BASIC INSPECTION: Special Repair Requirement".

For specification, refer to EC-572, "Idle Speed" and EC-572, "Ignition Timing".

Is the inspection result normal?

YES >> GO TO 13.

NO >> Follow the EC-20, "BASIC INSPECTION: Special Repair Requirement".

13. CHECK AIR FUEL RATIO (A/F) SENSOR 1 INPUT SIGNAL CIRCUIT

- Turn ignition switch OFF.
- Disconnect corresponding A/F sensor 1 harness connector.
- Disconnect ECM harness connector.
- 4. Check the continuity between A/F sensor 1 harness connector and ECM harness connector.

A/F sensor 1			EC	Continuity	
Bank	Connector	Terminal	Connector	Terminal	Continuity
1	F3	1		57	
ı	13	2 F102	E400	61	Existed
2	E20	1	F102	65	Existed
2	F20	2		66	

Check the continuity between A/F sensor 1 harness connector or ECM harness connector and ground.

	A/F sensor		ECM		Ground	Continuity
Bank	Connector	Terminal	Connector	Terminal	Oround	Continuity
1	F3	1		57		
· ·	гэ	2	F102	61	Ground	Not existed
2	F20	1	F102	65	Giodila	Not existed
2	1 20	2		66		

Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 14.

>> Repair open circuit, short to ground or short to power in harness or connectors. NO

14.CHECK A/F SENSOR 1 HEATER

Refer to EC-160, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 15.

NO >> Replace (malfunctioning) A/F sensor 1.

15. CHECK MASS AIR FLOW SENSOR

(P)With CONSULT-III

Check mass air flow sensor signal in "DATA MONITOR" mode with CONSULT-III.

For specification, refer to EC-572, "Mass Air Flow Sensor".

Check mass air flow sensor signal in Service \$01 with GST.

For specification, refer to EC-572, "Mass Air Flow Sensor".

Is the measurement value within the specification?

YES >> GO TO 16.

NO >> Check connectors for rusted terminals or loose connections in the mass air flow sensor circuit or ground. Refer to EC-178, "Diagnosis Procedure".

16. CHECK SYMPTOM MATRIX CHART

Check items on the rough idle symptom in EC-555, "Symptom Table".

Is the inspection result normal?

>> GO TO 17. YES

Revision: 2009 March

EC-265

EC

Α

Е

Н

K

M

N

2009 FX35/FX50

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

NO >> Repair or replace malfunctioning part.

17. ERASE THE 1ST TRIP DTC

Some tests may cause a 1st trip DTC to be set.

Erase the 1st trip DTC from the ECM memory after performing the tests. Refer to EC-111, "Diagnosis Description".

>> GO TO 18.

18. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

P0327, P0328, P0332, P0333 KS

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

P0327, P0328, P0332, P0333 KS

Description INFOID:0000000003856154

The knock sensor is attached to the cylinder block. It senses engine knocking using a piezoelectric element. A knocking vibration from the cylinder block is sensed as vibrational pressure. This pressure is converted into a voltage signal and sent to the ECM.

EC

Α

DTC Logic

INFOID:0000000003856155

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detected condition	Possible cause
P0327	Knock sensor (bank 1) circuit low input	An excessively low voltage from the sensor is sent to ECM.	
P0328	Knock sensor (bank 1) circuit high input	An excessively high voltage from the sensor is sent to ECM.	Harness or connectors (The sensor circuit is open or shorted.)
P0332	Knock sensor (bank 2) circuit low input	An excessively low voltage from the sensor is sent to ECM.	Knock sensor
P0333	Knock sensor (bank 2) circuit high input	An excessively high voltage from the sensor is sent to ECM.	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10 V at idle.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- Start engine and run it for at least 5 seconds at idle speed.
- Check 1st trip DTC. 2.

Is 1st trip DTC detected?

YFS >> Go to EC-267, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1. CHECK GROUND CONNECTION

- Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

>> GO TO 2. YES

NO >> Repair or replace ground connection.

2.CHECK KNOCK SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- Disconnect knock sensor harness connector and ECM harness connector.
- Check the continuity between knock sensor harness connector and ECM harness connector.

D

Н

INFOID:0000000003856156

Ν

DTC	Knock sensor			ECM		Continuity
ыс	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0327, P0328	1	F203	2	F102	72	Existed
P0332, P0333	2	F202	2	1 102	12	LXISIEU

3. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4. NO >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F9, F201
- Harness for open or short between knock sensor and ECM

>> Repair open circuit or short to power in harness or connectors.

4. CHECK KNOCK SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between knock sensor harness connector and ECM harness connector.

DTC	Knock sensor			EC	Continuity	
ыс	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0327, P0328	1	F203	1	F102	73	Existed
P0332, P0333	2	F202	1	F 102	69	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 6. NO >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F9, F201
- Harness for open or short between knock sensor and ECM
 - >> Repair open circuit, short to ground or short to power in harness or connectors.

6.CHECK KNOCK SENSOR

Refer to EC-268, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace malfunctioning knock sensor.

.CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000003856157

1. CHECK KNOCK SENSOR

- Turn ignition switch OFF.
- Disconnect knock sensor harness connector.
- Check resistance between knock sensor terminals as follows.NOTE:

P0327, P0328, P0332, P0333 KS

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

It is necessary to use an ohmmeter which can measure more than 10 M Ω .

Terminals	Resistance
1 and 2	Approx. 532 - 588 kΩ [at 20°C (68°F)]

CAUTION:

Never use any knock sensors that have been dropped or physically damaged. Use only new ones. <u>Is the inspection result normal?</u>

YES >> INSPECTION END

NO >> Replace malfunctioning knock sensor.

EC

Α

D

С

Е

F

G

Н

J

Κ

M

L

Ν

0

P0335 CKP SENSOR

Description INFOID:000000003856158

The crankshaft position (CKP) sensor is located on the cylinder block facing the gear teeth (cogs) of the signal plate. It detects the fluctuation of the engine revolution.

The sensor consists of a permanent magnet and Hall IC.

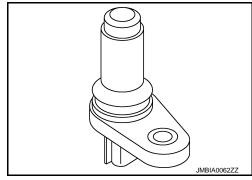
When the engine is running, the high and low parts of the teeth cause the gap with the sensor to change.

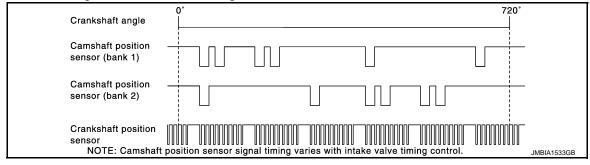
The changing gap causes the magnetic field near the sensor to change.

Due to the changing magnetic field, the voltage from the sensor changes.

The ECM receives the voltage signal and detects the fluctuation of the engine revolution.

ECM receives the signals as shown in the figure.





DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0335	Crankshaft position (CKP) sensor circuit	 The crankshaft position sensor signal is not detected by the ECM during the first few seconds of engine cranking. The proper pulse signal from the crankshaft position sensor is not sent to ECM while the engine is running. The crankshaft position sensor signal is not in the normal pattern during engine running. 	Harness or connectors (CKP sensor circuit is open or shorted.) [Camshaft position (CMP) sensor (bank 2) circuit is shorted.] [Exhaust valve timing (EVT) control position sensor (bank 2) circuit is shorted.] (Battery current sensor circuit is shorted.) [Accelerator pedal position (APP) sensor 2 circuit is shorted.] (EVAP control system pressure sensor circuit is shorted.) (Refrigerant pressure sensor circuit is shorted.) CKP sensor CMP sensor (bank 2) EVT control position sensor (bank 2) Battery current sensor APP sensor EVAP control system pressure sensor Refrigerant pressure sensor Refrigerant pressure sensor Signal plate

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.

P0335 CKP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10.5 V with ignition switch ON.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- Start engine and let it idle for at least 5 seconds. If engine does not start, crank engine for at least 2 seconds.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-271, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1. CHECK GROUND CONNECTION

Turn ignition switch OFF.

Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK CRANKSHAFT POSITION (CKP) SENSOR POWER SUPPLY CIRCUIT-I

- Disconnect CKP sensor harness connector.
- 2. Turn ignition switch ON.
- Check the voltage between CKP sensor harness connector and ground.

CKP	sensor	Ground	Voltage (V)	
Connector	Terminal	Ground	voltage (v)	
F2	1	Ground	Approx. 5	

Is the inspection result normal?

YES >> GO TO 8.

NO >> GO TO 3.

3.CHECK CKP SENSOR POWER SUPPLY CIRCUIT-II

- 1. Turn ignition switch ON.
- Disconnect ECM harness connector.
- Check the continuity between CKP sensor harness connector and ECM harness connector.

CKP s	ensor	EC	Continuity	
Connector	Terminal	Connector Terminal		Continuity
F2	1	F101	46	Existed

Is the inspection result normal?

YES >> GO TO 4.

Revision: 2009 March

NO >> Repair open circuit.

f 4.CHECK SENSOR POWER SUPPLY CIRCUIT

Check harness for short to power and short to ground, between the following terminals.

EC

Α

D

Е

INFOID:0000000003856160

Н

L

N

ECM		Sensor			
Connector	Terminal	Name	Connector	Terminal	
F101	46	CKP sensor	F2	1	
	Camshaft position (CMP) sensor (bank 2)		F18	1	
F102	64	Exhaust valve timing (EVT) control position sensor (bank 2)	F19	1	
		Battery current sensor	E21	1	
	103	Accelerator pedal (APP) sensor	E112 (Without ICC)	6	
M107		Accelerator pedal (AFF) Serisor		3	
	107	EVAP control system pressure sensor	B252	3	
	111	Refrigerant pressure sensor	E77	3	

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair short to ground or short to power in harness or connectors.

5. CHECK COMPONENTS

Check the following.

- CMP sensor (bank 2) (Refer to <u>EC-279</u>, "Component Inspection".)
- EVT control position sensor (bank 2) (Refer to <u>EC-371, "Component Inspection"</u>.)
- Battery current sensor (Refer to EC-402, "Component Inspection".)
- EVAP control system pressure sensor (Refer to EC-315, "Component Inspection".)
- Refrigerant pressure sensor (Refer to <u>HAC-85, "Diagnosis Procedure"</u>.)

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace malfunctioning component.

6.CHECK APP SENSOR

Refer to EC-446, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 12. NO >> GO TO 7.

7.REPLACE ACCELERATOR PEDAL ASSEMBLY

- Replace accelerator pedal assembly.
- Go to <u>EC-447</u>, "Special Repair Requirement".

>> INSPECTION END

8.CHECK CKP SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check the continuity between CKP sensor harness connector and ECM harness connector.

•	CKP sensor		EC	Continuity	
	Connector	Terminal	Connector	Terminal	Continuity
	F2	2	F101	47	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

[VQ35HR]

9.check ckp sensor input signal circuit for open and short

Check the continuity between CKP sensor harness connector and ECM harness connector.

CKP s	CKP sensor ECM		Continuity	
Connector	Terminal	Connector Terminal		Continuity
F2	3	F101	37	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

10. CHECK CKP SENSOR

Refer to EC-273, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 11.

NO >> Replace crankshaft position sensor.

11. CHECK GEAR TOOTH

Visually check for chipping signal plate gear tooth.

Is the inspection result normal?

YES >> GO TO 12.

NO >> Replace the signal plate.

12. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

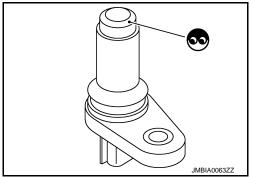
1. CHECK CRANKSHAFT POSITION SENSOR-I

- Turn ignition switch OFF.
- 2. Loosen the fixing bolt of the sensor.
- 3. Disconnect crankshaft position sensor harness connector.
- Remove the sensor.
- Visually check the sensor for chipping.

Is the inspection result normal?

YES >> GO TO 2.

>> Replace crankshaft position sensor. NO



2.CHECK CRANKSHAFT POSITION SENSOR-II

Check resistance between crankshaft position sensor terminals as follows.

Terminals (Polarity)	Resistance
1 (+) - 2 (-)	
1 (+) - 3 (-)	Except 0 or ∞ Ω [at 25°C (77°F)]
2 (+) - 3 (-)	

EC-273 Revision: 2009 March 2009 FX35/FX50

EC

D

INFOID:000000000385616

M

Ν

P0335 CKP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace crankshaft position sensor.

P0340, P0345 CMP SENSOR

Description INFOID:000000003856162

The camshaft position (CMP) sensor senses the retraction of camshaft (INT) to identify a particular cylinder. The camshaft position sensor senses the piston position.

When the crankshaft position sensor system becomes inoperative, the camshaft position sensor provides various controls of engine parts instead, utilizing timing of cylinder identification signals.

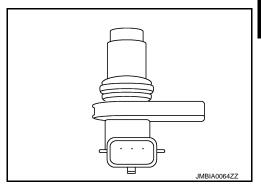
The sensor consists of a permanent magnet and Hall IC.

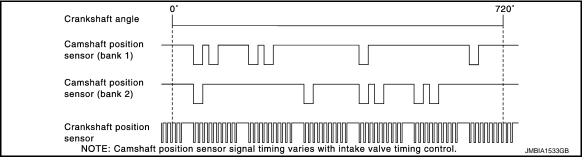
When engine is running, the high and low parts of the teeth cause the gap with the sensor to change.

The changing gap causes the magnetic field near the sensor to change.

Due to the changing magnetic field, the voltage from the sensor changes.

ECM receives the signals as shown in the figure.





DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P0340 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. Refer to EC-361, "DTC Logic".

C

Α

EC

D

Е

F

G

Н

K

N

0

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0340	Camshaft position (CMP) sensor (bank 1) circuit		Harness or connectors [CMP sensor (bank 1) circuit is open or shorted.] CMP sensor (bank 1) Camshaft (INT) Starter motor Starting system circuit Dead (Weak) battery
P0345	Camshaft position (CMP) sensor (bank 2) circuit	 The cylinder No. signal is not sent to ECM for the first few seconds during engine cranking. The cylinder No. signal is not sent to ECM during engine running. The cylinder No. signal is not in the normal pattern during engine running. 	Harness or connectors [CMP sensor (bank 2) circuit is open or shorted.] [Crankshaft position (CKP) sensor circuit is shorted.] [Exhaust valve timing (EVT) control position sensor (bank 2) circuit is shorted.] (Battery current sensor circuit is shorted.) [Accelerator pedal position (APP) sensor 2 circuit is shorted.] (EVAP control system pressure sensor circuit is shorted.) (Refrigerant pressure sensor circuit is shorted.) CMP sensor (bank 2) CKP sensor EVT control position sensor (bank 2) Battery current sensor APP sensor EVAP control system pressure sensor Refrigerant pressure sensor Camshaft (INT) Starter motor Starting system circuit Dead (Weak) battery

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10.5 V with ignition switch ON.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE-I

- Start engine and let it idle for at least 5 seconds.
 If engine does not start, crank engine for at least 2 seconds.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-277, "Diagnosis Procedure".

NO >> GO TO 3.

3.perform dtc confirmation procedure-i

- 1. Maintaining engine speed at more than 800 rpm for at least 5 seconds.
- Check 1st trip DTC.

Is 1st trip DTC detected?

P0340, P0345 CMP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

YES >> Go to EC-277, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003856164

1. CHECK STARTING SYSTEM

Turn ignition switch to START position.

Does the engine turn over? Does the starter motor operate?

YES >> GO TO 2.

NO >> Check starting system. (Refer to STR-2, "Work Flow".)

2.CHECK GROUND CONNECTION

D

Е

Α

EC

- Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace ground connection.

3.check camshaft position (cmp) sensor power supply circuit-i

- Disconnect CMP sensor harness connector.
- 2. Turn ignition switch ON.
- Check the voltage between CMP sensor harness connector and ground.

DTC		CMP sensor			Voltage (V)	
DIC	Bank	Connector	Terminal	Ground	voltage (v)	
P0340	1	F5	1	Ground	Approx. 5	
P0345	2	F18	1	Giodila	Αρρίολ. 3	

Is the inspection result normal?

YES >> GO TO 9.

NO-1 >> P0340: Repair open circuit, short to ground or short to power in harness or connectors.

NO-2 >> P0345: GO TO 4.

f 4.CHECK CMP SENSOR POWER SUPPLY CIRCUIT-II

- Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check the continuity between CMP sensor harness connector and ECM harness connector.

CMP sensor			EC	Continuity	
Bank	Connector	Terminal	Connector	Terminal	Continuity
2	F18	1	F102	64	Existed

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit.

${f 5.}$ CHECK CMP SENSOR POWER SUPPLY CIRCUIT-III

Check harness for short to power and short to ground, between the following terminals.

E	СМ	Sensor		
Connector	Terminal	Name	Connector	Terminal
F101	46	Crankshaft position (CKP) sensor	F2	1

EC-277 Revision: 2009 March 2009 FX35/FX50

F

Н

Ν

< DTC/CIRCUIT DIAGNOSIS >

ECM		Sensor				
Connector	Terminal	Name	Connector	Terminal		
		CMP sensor (bank 2)	F18	1		
F102	64	Exhaust valve timing (EVT) control position sensor (bank 2)	F19	1		
		Battery current sensor	E21	1		
	103	402 Accelerator podel position (ADD) concer		6		
M107		Accelerator pedal position (APP) sensor	E116 (With ICC)	3		
	107	EVAP control system pressure sensor	B252	3		
	111	Refrigerant pressure sensor	E77	3		

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair short to ground or short to power in harness or connectors.

6. CHECK COMPONENTS

Check the following.

- CKP sensor (Refer to <u>EC-273</u>, "Component Inspection".)
- EVT control position sensor (bank 2) (Refer to <u>EC-371, "Component Inspection"</u>.)
- Battery current sensor (Refer to EC-402, "Component Inspection".)
- EVAP control system pressure sensor (Refer to <u>EC-315, "Component Inspection"</u>.)
- Refrigerant pressure sensor (Refer to <u>HAC-85</u>, "<u>Diagnosis Procedure</u>".)

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace malfunctioning component.

7. CHECK APP SENSOR

Refer to EC-446, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 15.

NO >> GO TO 8.

8.REPLACE ACCELERATOR PEDAL ASSEMBLY

- 1. Replace accelerator pedal assembly.
- 2. Go to EC-447, "Special Repair Requirement".

>> INSPECTION END

$9.\mathsf{CHECK}$ CMP SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- Disconnect ECM harness connector.
- 3. Check the continuity between CMP sensor harness connector and ECM harness connector.

DTC	DTC CMP sensor		ECM		Continuity	
ыс	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0340	1	F5	2	F102	96	Existed
P0345	2	F18	2	1 102	92	LAISIEU

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 11. NO >> GO TO 10.

10. DETECT MALFUNCTIONING PART

P0340, P0345 CMP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

Check the following.

- Harness connectors F106, F107
- Harness for open or short between CMP sensor and ECM

>> Repair open circuit, short to ground or short to power in harness or connectors.

11. CHECK CMP SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

Check the continuity between CMP sensor harness connector and ECM harness connector.

DTC		CMP sense	or	ECM		Continuity
ыс	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0340	1	F5	3	F102	59	Existed
P0345	2	F18	3	1 102	63	LXISIGU

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 13. NO >> GO TO 12.

12. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F106, F107
- Harness for open or short between CMP sensor and ECM

>> Repair open circuit, short to ground or short to power in harness or connectors.

13. CHECK CMP SENSOR

Refer to EC-279, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 14.

NO >> Replace malfunctioning camshaft position sensor.

14. CHECK CAMSHAFT (INT)

Check the following.

- Accumulation of debris to the signal plate of camshaft rear end
- · Chipping signal plate of camshaft rear end

Is the inspection result normal?

YES >> GO TO 15.

NO

>> Remove debris and clean the signal plate of camshaft rear end or replace camshaft.

15. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

- 1. CHECK CAMSHAFT POSITION SENSOR-I
- Turn ignition switch OFF.
- 2. Loosen the fixing bolt of the sensor.
- Disconnect camshaft position sensor harness connector.

[VQ35HR]

EC

Α

Е

Н

K

Ν

INFOID:0000000003856165

P0340, P0345 CMP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

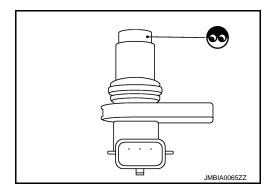
[VQ35HR]

- 4. Remove the sensor.
- 5. Visually check the sensor for chipping.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace malfunctioning camshaft position sensor.



$2. \hbox{check camshaft position sensor-ii}$

Check resistance camshaft position sensor terminals as follows.

Terminals (Polarity)	Resistance
1 (+) - 2 (-)	
1 (+) - 3 (-)	Except 0 or ∞ Ω [at 25°C (77°F)]
2 (+) - 3 (-)	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace malfunctioning camshaft position sensor.

[VQ35HR]

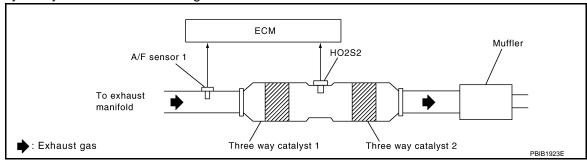
P0420, P0430 THREE WAY CATALYST FUNCTION

DTC Logic INFOID:0000000003856166

DTC DETECTION LOGIC

The ECM monitors the switching frequency ratio of air fuel ratio (A/F) sensor 1 and heated oxygen sensor 2. A three way catalyst 1 with high oxygen storage capacity will indicate a low switching frequency of heated oxygen sensor 2. As oxygen storage capacity decreases, the heated oxygen sensor 2 switching frequency will increase.

When the frequency ratio of A/F sensor 1 and heated oxygen sensor 2 approaches a specified limit value, the three way catalyst 1 malfunction is diagnosed.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0420	Catalyst system efficiency below threshold (bank 1)	Three way catalyst 1 does not operate	Three way catalyst 1 Exhaust tube
P0430	Catalyst system efficiency below threshold (bank 2)	 properly. Three way catalyst 1 does not have enough oxygen storage capacity. 	 Intake air leaks Fuel injector Fuel injector leaks Spark plug Improper ignition timing

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

Will CONSULT-III be used?

YES >> GO TO 2.

NO >> GO TO 6.

2.PERFORM DTC CONFIRMATION PROCEDURE-I

(P)With CONSULT-III **TESTING CONDITION:**

Do not maintain engine speed for more than the specified minutes below.

- Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-III.
- Start engine and warm it up to the normal operating temperature. 2.
- Turn ignition switch OFF and wait at least 10 seconds. 3.
- Turn ignition switch ON. 4.
- Turn ignition switch OFF and wait at least 10 seconds.
- Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- 7. Let engine idle for 1 minute.
- Check that "COOLAN TEMP/S" indicates more than 70°C (158°F). If not, warm up engine and go to next step when "COOLAN TEMP/S" indication reaches to 70°C (158°F).
- Open engine hood.
- 10. Select "DTC & SRT CONFIRMATION" then "SRT WORK SUPPORT" mode with CONSULT-III.

EC

Α

D

F

Н

M

N

P0420, P0430 THREE WAY CATALYST FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

- 11. Rev engine between 2,000 and 3,000 rpm and hold it for 3 consecutive minutes then release the accelerator pedal completely.
- 12. Check the indication of "CATALYST".

Which is displayed on CONSULT-III screen?

CMPLT>> GO TO 5.

INCMP >> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE-II

- 1. Wait 5 seconds at idle.
- 2. Rev engine between 2,000 and 3,000 rpm and maintain it until "INCMP" of "CATALYST" changes to "CMPLT" (It will take approximately 5 minutes).

Does the indication change to "CMPLT"?

YES >> GO TO 5.

NO >> GO TO 4.

f 4.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

- 1. Stop engine and cool it down to less than 70°C (158°F).
- 2. Perform DTC CONFIRMATION PROCEDURE again.

>> GO TO 2.

5. PERFORM DTC CONFIRMATION PROCEDURE-III

Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-283, "Diagnosis Procedure".

NO >> INSPECTION END

6.PERFORM COMPONENT FUNCTION CHECK

With GST

Perform component function check. Refer to EC-282, "Component Function Check".

NOTE:

Use component function check to check the overall function of the three way catalyst 1. During this check, a 1st trip DTC might not be confirmed.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-283, "Diagnosis Procedure".

Component Function Check

INFOID:0000000003856167

1. PERFORM COMPONENT FUNCTION CHECK

With GST

- 1. Start engine and warm it up to the normal operating temperature.
- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- 6. Let engine idle for 1 minute.
- 7. Open engine hood.
- 8. Check the voltage between ECM harness connector terminals under the following condition.

P0420, P0430 THREE WAY CATALYST FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

		ECM				
DTC	Connector	+	_	Condition	Voltage	
	Connector	Terminal	Terminal			
P0420	F102	76 [HO2S2 (bank 1)] F102 Keeping engine speed at 2,500 r	Keeping engine speed at 2,500 rpm	The voltage fluctuation cycle takes more than 5 seconds.		
P0430	1 102	80 [HO2S2 (bank 2)]	04	constant under no load	• 1 cycle: 0.6 - 1.0 → 0 - 0.3 → 0.6 - 1.0	
Is the in	Is the inspection result normal?					

YES >> INSPECTION END

NO >> Go to EC-283, "Diagnosis Procedure".

Diagnosis Procedure

1. CHECK EXHAUST SYSTEM

Visually check exhaust tubes and muffler for dents.

Is the inspection result normal?

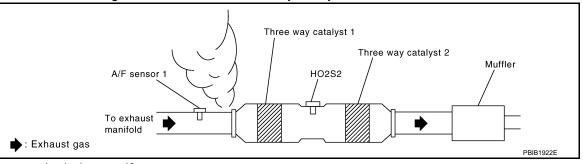
YES >> GO TO 2.

NO >> Repair or replace malfunctioning part.

2. CHECK EXHAUST GAS LEAK

Start engine and run it at idle.

Listen for an exhaust gas leak before the three way catalyst 1.



Is exhaust gas leak detected?

YES >> Repair or replace malfunctioning part.

NO >> GO TO 3.

3.CHECK INTAKE AIR LEAK

Listen for an intake air leak after the mass air flow sensor.

Is intake air leak detected?

YES >> Repair or replace malfunctioning part.

NO >> GO TO 4.

4. CHECK IDLE SPEED AND IGNITION TIMING

Check idle speed and ignition timing.

For procedure, refer to EC-20, "BASIC INSPECTION: Special Repair Requirement".

For specification, refer to EC-572, "Idle Speed" and EC-572, "Ignition Timing".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Follow the EC-20, "BASIC INSPECTION: Special Repair Requirement".

${f 5.}$ CHECK FUEL INJECTORS

- Stop engine and then turn ignition switch ON.
- Check the voltage between ECM harness connector terminals as follows.

EC-283 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

INFOID:0000000003856168

M

Ν

ECM				
+		_		Voltage
Connector	Terminal	Connector	Terminal	
F102	81	- M107	128	Battery voltage
	82			
	85			
	86			
	89			
	90			

Is the inspection result normal?

YES >> GO TO 6.

NO >> Perform <u>EC-472</u>, "<u>Diagnosis Procedure</u>".

6.CHECK FUNCTION OF IGNITION COIL-I

CAUTION:

Perform the following procedure in a place with no combustible objects and good ventilation.

- 1. Turn ignition switch OFF.
- Remove fuel pump fuse (1) in IPDM E/R (2) to release fuel pressure.

NOTE:

Do not use CONSULT-III to release fuel pressure, or fuel pressure applies again during the following procedure.

- 3. Start engine.
- After engine stalls, crank it 2 or 3 times to release all fuel pressure.
- 5. Turn ignition switch OFF.
- 6. Remove all ignition coil harness connectors to avoid the electrical discharge from the ignition coils.
- Remove ignition coil and spark plug of the cylinder to be checked.
- 8. Crank engine for 5 seconds or more to remove combustion gas in the cylinder.
- 9. Connect spark plug and harness connector to ignition coil.
- 10. Fix ignition coil using a rope etc. with gap of 13 17 mm (0.52 0.66 in) between the edge of the spark plug and grounded metal portion as shown in the figure.
- Crank engine for approximately 3 seconds, and check whether spark is generated between the spark plug and the grounded metal portion.



CAUTION:

- Never place to the spark plug and the ignition coil within 50 cm (19.7 in). Be careful not to get an electrical shock while checking, because the electrical discharge voltage becomes 20 kV or more.
- It might damage the ignition coil if the gap of more than 17 mm (0.66 in) is made.

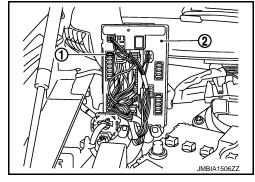
When the gap is less than 13 mm (0.52 in), a spark might be generated even if the coil is malfunctioning.

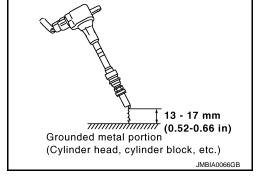
Is the inspection result normal?

YES >> GO TO 10. NO >> GO TO 7.

7.CHECK FUNCTION OF IGNITION COIL-II

Turn ignition switch OFF.





P0420, P0430 THREE WAY CATALYST FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

Disconnect spark plug and connect a known-good spark plug.

3. Crank engine for approximately 3 seconds, and recheck whether spark is generated between the spark plug and the grounded metal portion.

EC

[VQ35HR]

Spark should be generated.

Is the inspection result normal?

YES >> GO TO 8.

NO >> Check ignition coil, power transistor and their circuits. Refer to EC-482, "Diagnosis Procedure".

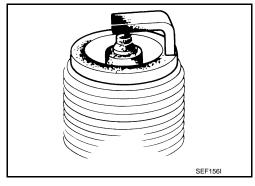
8. CHECK SPARK PLUG

Check the initial spark plug for fouling, etc.

Is the inspection result normal?

YES >> Replace spark plug(s) with standard type one(s). For spark plug type, refer to EM-143, "Spark Plug".

NO >> Repair or clean spark plug. Then GO TO 9.



9. CHECK FUNCTION OF IGNITION COIL-III

Reconnect the initial spark plugs.

2. Crank engine for approximately 3 seconds, and recheck whether spark is generated between the spark plug and the grounded portion.

Spark should be generated.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace spark plug(s) with standard type one(s). For spark plug type, refer to <u>EM-143, "Spark Plug"</u>.

10. CHECK FUEL INJECTOR

1. Turn ignition switch OFF.

Remove fuel injector assembly.

Refer to EM-40, "Removal and Installation".

Keep fuel hose and all fuel injectors connected to fuel tube.

3. Disconnect all ignition coil harness connectors.

4. Reconnect all fuel injector harness connectors disconnected.

5. Turn ignition switch ON.

Does fuel drip from fuel injector?

YES >> Replace the fuel injector(s) from which fuel is dripping.

NO >> GO TO 11.

11. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace three way catalyst assembly.

NO >> Repair or replace harness or connector.

F

D

Е

k

IV.

Ν

Р

Revision: 2009 March **EC-285** 2009 FX35/FX50

P0441 EVAP CONTROL SYSTEM

DTC Logic

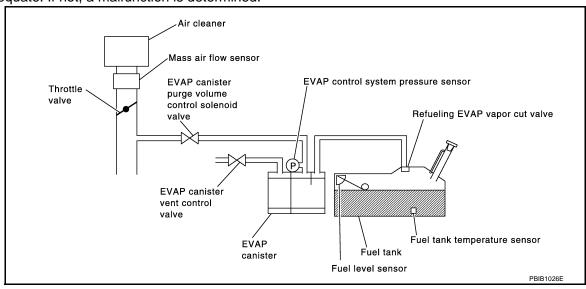
DTC DETECTION LOGIC

NOTE:

If DTC P0441 is displayed with other DTC such as P2122, P2123, P2127, P2128 or P2138, first perform trouble diagnosis for other DTC.

In this evaporative emission (EVAP) control system, purge flow occurs during non-closed throttle conditions. Purge volume is related to air intake volume. Under normal purge conditions (non-closed throttle), the EVAP canister purge volume control solenoid valve is open to admit purge flow. Purge flow exposes the EVAP control system pressure sensor to intake manifold vacuum.

Under normal conditions (non-closed throttle), sensor output voltage indicates if pressure drop and purge flow are adequate. If not, a malfunction is determined.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0441	EVAP control system incorrect purge flow	EVAP control system does not operate properly, EVAP control system has a leak between intake manifold and EVAP control system pressure sensor.	EVAP canister purge volume control solenoid valve stuck closed EVAP control system pressure sensor and the circuit Loose, disconnected or improper connection of rubber tube Blocked rubber tube Cracked EVAP canister EVAP canister purge volume control solenoid valve circuit Accelerator pedal position sensor Blocked purge port EVAP canister vent control valve

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

Will CONSULT-III be used?

YES >> GO TO 2. NO >> GO TO 5.

P0441 EVAP CONTROL SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

2.perform dtc confirmation procedure-i

With CONSULT-III

TESTING CONDITION:

Always perform test at a temperature of 5°C (41°F) or more.

- Start engine and warm it up to normal operating temperature.
- Turn ignition switch OFF and wait at least 10 seconds.
- 3. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.
- Start engine and let it idle for at least 70 seconds.
- Select "PURG FLOW P0441" of "EVAPORATIVE SYSTEM" in "DTC WORK SUPPORT" mode with CON-SULT-III.
- Touch "START". 7.

Is "COMPLETED" displayed on CONSULT-III screen?

YES >> GO TO 4.

NO >> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE-II

When the following conditions are met, "TESTING" will be displayed on the CONSULT-III screen. Maintain the conditions continuously until "TESTING" changes to "COMPLETED". (It will take at least 35 seconds.)

Selector lever	Suitable position
VHCL SPEED SE	32 - 120 km/h (20 - 75 mph)
ENG SPEED	500 - 3,000 rpm
B/FUEL SCHDL	1.3 - 9.0 msec
COOLAN TEMP/S	More than 0°C (32°F)

CAUTION:

Always drive vehicle at a safe speed.

If "TESTING" does not change for a long time, retry from step 2.

Is "COMPLETED" displayed on CONSULT-III screen?

YES >> GO TO 4.

NO >> Perform DTC CONFIRMATION PROCEDURE again. GO TO 2.

f 4.PERFORM DTC CONFIRMATION PROCEDURE-III

Touch "SELF-DIAG RESULTS".

Which is displayed on CONSULT-III screen?

OK >> INSPECTION END

NG >> Go to EC-288, "Diagnosis Procedure".

${f 5.}$ PERFORM COMPONENT FUNCTION CHECK

Perform component function check. Refer to EC-287, "Component Function Check".

Use component function check to check the overall monitoring function of the EVAP control system purge flow monitoring. During this check, a 1st trip DTC might not be confirmed.

Is the inspection result normal?

>> INSPECTION END YES

>> Go to EC-288, "Diagnosis Procedure". NO

Component Function Check

1. PERFORM COMPONENT FUNCTION CHECK

- 1. Lift up drive wheels.
- Start engine (VDC switch OFF) and warm it up to normal operating temperature.

EC

D

Е

Н

N

Р

INFOID:0000000003856170

P0441 EVAP CONTROL SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

- Turn ignition switch OFF and wait at least 10 seconds.
- 4. Turn ignition switch ON.
- 5. Turn ignition switch OFF and wait at least 10 seconds.
- 6. Start engine and wait at least 70 seconds.
- 7. Set voltmeter probes to ECM harness connector terminals under the following condition.

	ECM	
Connector -	+	_
	Terminal	Terminal
M107	102 (EVAP control system pressure sensor signal)	112

- 8. Check EVAP control system pressure sensor value at idle speed and note it.
- 9. Establish and maintain the following conditions for at least 1 minute.

Air conditioner switch	ON
Headlamp switch	ON
Rear window defogger switch	ON
Engine speed	Approx. 3,000 rpm
Gear position	Any position other than P, N or R

10. Verify that EVAP control system pressure sensor value stays 0.1 V less than the value at idle speed (measured at step 6) for at least 1 second.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-288, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003856171

1. CHECK EVAP CANISTER

- 1. Turn ignition switch OFF.
- 2. Check EVAP canister for cracks.

Is the inspection result normal?

YES-1 >> With CONSULT-III: GO TO 2.

YES-2 >> Without CONSULT-III: GO TO 3.

NO >> Replace EVAP canister.

2.CHECK PURGE FLOW

(P)With CONSULT-III

- Disconnect vacuum hose connected to EVAP canister purge volume control solenoid valve at EVAP service port.
- Start engine and let it idle.
- Select "PURG VOL CONT/V" in "ACTIVE TEST" mode with CONSULT-III.
- Touch "Qd" and "Qu" on CONSULT-III screen to adjust "PURG VOL CONT/V" opening and check vacuum existence.

PURG VOL CONT/V	Vacuum
100%	Existed
0%	Not existed

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 4.

3. CHECK PURGE FLOW

⋈ Without CONSULT-III

1. Start engine and warm it up to normal operating temperature.

P0441 EVAP CONTROL SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

- Stop engine.
- Disconnect vacuum hose connected to EVAP canister purge volume control solenoid valve at EVAP service port and install vacuum gauge. For the location of EVAP service port, refer to EC-84, "System Diagram".
- Start engine and let it idle.

Do not depress accelerator pedal even slightly.

5. Check vacuum gauge indication before 60 seconds pass after starting engine.

Vacuum should not exist.

Rev engine up to 2,000 rpm after 100 seconds pass after starting engine.

Vacuum should exist.

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 4.

4. CHECK EVAP PURGE LINE

- Turn ignition switch OFF.
- Check EVAP purge line for improper connection or disconnection. Refer to EC-84, "System Diagram".

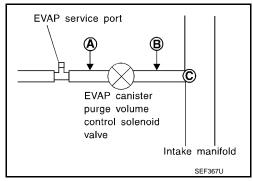
Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair EVAP purge line.

5.CHECK EVAP PURGE HOSE AND PURGE PORT

- Disconnect purge hoses connected to EVAP service port A and EVAP canister purge volume control solenoid valve **B**.
- Blow air into each hose and EVAP purge port C.



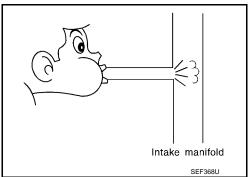
3. Check that air flows freely.

Is the inspection result normal?

YES-1 >> With CONSULT-III: GO TO 6.

YES-2 >> Without CONSULT-III: GO TO 7.

>> Repair or clean hoses and/or purge port.



6.CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

(E) With CONSULT-III

- Start engine.
- Perform "PURG VOL CONT/V" in "ACTIVE TEST" mode with CONSULT-III. Check that engine speed varies according to the valve opening.

Does engine speed vary according to the valve opening?

YES >> GO TO 8.

NO >> GO TO 7.

Revision: 2009 March

EC-289

EC

D

Е

Н

M

Ν

P0441 EVAP CONTROL SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

7.CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-300, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 8.

NO >> Replace EVAP canister purge volume control solenoid valve.

8.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR CONNECTOR

- 1. Disconnect EVAP control system pressure sensor harness connector.
- 2. Check connectors for water.

Water should not exist.

Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace EVAP control system pressure sensor.

9.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR FUNCTION

Refer to EC-317, "DTC Logic" for DTC P0452, EC-322, "DTC Logic" for DTC P0453.

Is the inspection result normal?

YES >> GO TO 10.

NO >> Replace EVAP control system pressure sensor.

10.CHECK RUBBER TUBE FOR CLOGGING

- 1. Disconnect rubber tube connected to EVAP canister vent control valve.
- 2. Check the rubber tube for clogging.

Is the inspection result normal?

YES >> GO TO 11.

NO >> Clean the rubber tube using an air blower.

11. CHECK EVAP CANISTER VENT CONTROL VALVE

Refer to EC-307, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 12.

NO >> Replace EVAP canister vent control valve.

12.CHECK EVAP PURGE LINE

Inspect EVAP purge line (pipe and rubber tube). Check for evidence of leaks.

Refer to EC-84, "System Diagram".

Is the inspection result normal?

YES >> GO TO 13.

NO >> Repair or replace malfunctioning part.

13. CLEAN EVAP PURGE LINE

Clean EVAP purge line (pipe and rubber tube) using air blower.

>> GO TO 14.

14. CHECK INTERMITTENT INCIDENT

Refer to GI-35. "Intermittent Incident".

>> INSPECTION END

[VQ35HR]

Α

EC

D

Е

F

P0442 EVAP CONTROL SYSTEM

DTC Logic

DTC DETECTION LOGIC

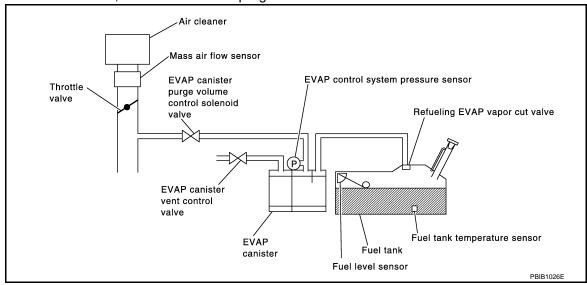
NOTE:

If DTC P0442 is displayed with DTC P0456, first perform the trouble diagnosis for DTC P0456. Refer to <u>EC-334, "DTC Logic"</u>.

This diagnosis detects leaks in the EVAP purge line using engine intake manifold vacuum.

If pressure does not increase, the ECM will check for leaks in the line between the fuel tank and EVAP canister purge volume control solenoid valve, under the following "Vacuum test" conditions.

The EVAP canister vent control valve is closed to shut the EVAP purge line off. The EVAP canister purge volume control solenoid valve will then be opened to depressurize the EVAP purge line using intake manifold vacuum. After this occurs, the EVAP canister purge volume control solenoid valve will be closed.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	
P0442	EVAP control system small leak detected (negative pressure)	EVAP control system has a leak, EVAP control system does not operate properly.	Incorrect fuel tank vacuum relief valve Incorrect fuel filler cap used Fuel filler cap remains open or does not close. Foreign matter caught in fuel filler cap. Leak is in line between intake manifold and EVAP canister purge volume control solenoid valve. Foreign matter caught in EVAP canister vent control valve. EVAP canister or fuel tank leaks EVAP purge line (pipe and rubber tube) leaks EVAP purge line rubber tube bent Loose or disconnected rubber tube EVAP canister vent control valve and the circuit EVAP canister purge volume control solenoid valve and the circuit Fuel tank temperature sensor O-ring of EVAP canister vent control valve is missing or damaged EVAP canister is saturated with water EVAP control system pressure sensor	
			 Fuel tank temperature sensor O-ring of EVAP canister vent control valve is missing or damaged EVAP canister is saturated with water 	

CAUTION

- Use only a genuine NISSAN fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the MIL may illuminate.
- If the fuel filler cap is not tightened properly, the MIL may illuminate.

Revision: 2009 March EC-291 2009 FX35/FX50

• Use only a genuine NISSAN rubber tube as a replacement.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

NOTE:

Check that EVAP hoses are connected to EVAP canister purge volume control solenoid valve properly.

Will CONSULT-III be used?

YES >> GO TO 2. NO >> GO TO 3.

2.perform dtc confirmation procedure

(P)With CONSULT-III

TESTING CONDITION:

- Perform "DTC WORK SUPPORT" when the fuel level is between 1/4 and 3/4 full, and vehicle is placed on flat level surface.
- Always perform test at a temperature of 0 to 30°C (32 to 86°F).
- 1. Turn ignition switch ON.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-III.
- 4. Check that the following conditions are met.

COOLAN TEMP/S: 0 - 70°C (32 - 158°F)

INT/A TEMP SE: 0 - 30°C (32 - 86°F)

 Select "EVP SML LEAK PÒ442/P1442" of "EVAPORATIVE SYSTEM" in "DTC WORK SUPPORT" mode with CONSULT-III.

Follow the instructions displayed.

NOTE:

If the engine speed cannot be maintained within the range displayed on the CONSULT-III screen, go to EC-20, "BASIC INSPECTION: Special Repair Requirement".

Which is displayed on CONSULT-III screen?

OK >> INSPECTION END

NG >> Go to EC-292, "Diagnosis Procedure".

3.PERFORM DTC CONFIRMATION PROCEDURE

With GST

NOTE:

Be sure to read the explanation of Driving Pattern in EC-546. "How to Set SRT Code" before driving vehicle.

- Start engine.
- 2. Drive vehicle according to Driving Pattern.
- 3. Stop vehicle.
- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Turn ignition switch ON.
- 6. Turn ignition switch OFF and wait at least 10 seconds.
- 7. Turn ignition switch ON.
- 8. Check 1st trip DTC.

Is 1st trip DTC displayed?

YES-1 >> P0441: Go to <u>EC-288</u>, "<u>Diagnosis Procedure</u>". YES-2 >> P0442: Go to <u>EC-292</u>, "<u>Diagnosis Procedure</u>". NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003856173

[VQ35HR1

1. CHECK FUEL FILLER CAP DESIGN

1. Turn ignition switch OFF.

Revision: 2009 March **EC-292** 2009 FX35/FX50

P0442 EVAP CONTROL SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

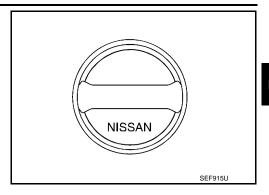
[VQ35HR]

Check for genuine NISSAN fuel filler cap design.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace with genuine NISSAN fuel filler cap.



2. CHECK FUEL FILLER CAP INSTALLATION

Check that the cap is tightened properly by rotating the cap clockwise.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Open fuel filler cap, then clean cap and fuel filler neck threads using air blower. Retighten until ratcheting sound is heard.

3.CHECK FUEL FILLER CAP FUNCTION

Check for air releasing sound while opening the fuel filler cap.

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4. CHECK FUEL TANK VACUUM RELIEF VALVE

Refer to EC-296, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace fuel filler cap with a genuine one.

5.CHECK FOR EVAP LEAK

Refer to EC-568, "Inspection".

Is there any leak in EVAP line?

YES >> Repair or replace malfunctioning part.

NO >> GO TO 6.

6.CHECK EVAP CANISTER VENT CONTROL VALVE

Check the following.

EVAP canister vent control valve is installed properly.

Refer to EC-570, "Removal and Installation".

EVAP canister vent control valve.

Refer to EC-307, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace EVAP canister vent control valve and O-ring.

7.CHECK IF EVAP CANISTER IS SATURATED WITH WATER

 Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.

EC

Α

С

D

Е

F

G

Н

J

K

. .

M

Ν

0

Ρ

P0442 EVAP CONTROL SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

2. Check if water will drain from EVAP canister (1).

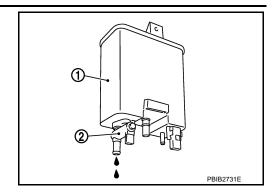
2 : EVAP canister vent control valve

Does water drain from the EVAP canister?

YES >> GO TO 8.

NO-1 >> With CONSULT-III: GO TO 10.

NO-2 >> Without CONSULT-III: GO TO 11.



8. CHECK EVAP CANISTER

Weigh the EVAP canister with the EVAP canister vent control valve and EVAP control system pressure sensor attached.

The weight should be less than 2.1 kg (4.6 lb).

Is the inspection result normal?

YES-1 >> With CONSULT-III: GO TO 10.

YES-2 >> Without CONSULT-III: GO TO 11.

NO >> GO TO 9.

9. DETECT MALFUNCTIONING PART

Check the following.

- EVAP canister for damage
- EVAP hose between EVAP canister and vehicle frame for clogging or poor connection

>> Repair hose or replace EVAP canister.

10.check evap canister purge volume control solenoid valve operation

(P)With CONSULT-III

- Disconnect vacuum hose connected to EVAP canister purge volume control solenoid valve at EVAP service port.
- Start engine and let it idle.
- 3. Select "PURG VOL CONT/V" in "ACTIVE TEST" mode.
- 4. Touch "Qu" on CONSULT-III screen to increase "PURG VOL CONT/V" opening to 100%.
- Check vacuum hose for vacuum.

Vacuum should exist.

Is the inspection result normal?

YES >> GO TO 13.

NO >> GO TO 12.

11.CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

⋈Without CONSULT-III

- Start engine and warm it up to normal operating temperature.
- Stop engine.
- Disconnect vacuum hose connected to EVAP canister purge volume control solenoid valve at EVAP service port.
- 4. Start engine and let it idle for at least 80 seconds.
- 5. Check vacuum hose for vacuum when revving engine up to 2,000 rpm.

Vacuum should exist.

Is the inspection result normal?

YES >> GO TO 13.

NO >> GO TO 12.

12. CHECK VACUUM HOSE

Check vacuum hoses for clogging or disconnection. Refer to EC-84, "System Diagram".

P0442 EVAP CONTROL SYSTEM

< DTC/CIRCUIT DIAGNOSIS >	[VQ35HR]
Is the inspection result normal?	
YES >> GO TO 13.	
NO >> Repair or reconnect the hose.	
13. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE	
Refer to EC-300, "Component Inspection".	
Is the inspection result normal?	
YES >> GO TO 14.	
NO >> Replace EVAP canister purge volume control solenoid valve.	
14. CHECK FUEL TANK TEMPERATURE SENSOR	
Refer to EC-247, "Component Inspection".	
Is the inspection result normal?	
YES >> GO TO 15. NO >> Replace "fuel level sensor unit and fuel pump".	
15. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR	
Refer to EC-315, "Component Inspection".	
Is the inspection result normal? YES >> GO TO 16.	
YES >> GO TO 16. NO >> Replace EVAP control system pressure sensor.	
16. CHECK EVAP PURGE LINE	
Check EVAP purge line (pipe, rubber tube, fuel tank and EVAP canister) for cracks or improp	er connection
Refer to EC-84, "System Diagram".	ci comiccion.
Is the inspection result normal?	
YES >> GO TO 17.	
NO >> Repair or reconnect the hose.	
17.clean evap purge line	
Clean EVAP purge line (pipe and rubber tube) using air blower.	
>> GO TO 18.	
18. CHECK EVAP/ORVR LINE	
Check EVAP/ORVR line between EVAP canister and fuel tank for clogging, kinks, loosene	ss and improper
connection. For location, refer to EC-489, "Description".	
Is the inspection result normal?	
YES >> GO TO 19.	
NO >> Repair or replace hoses and tubes.	
19.check recirculation line	
Check recirculation line between filler neck tube and fuel tank for clogging, kinks, cracks improper connection.	, looseness and
Is the inspection result normal?	
YES >> GO TO 20.	
NO >> Repair or replace hose, tube or filler neck tube.	
20.check refueling evap vapor cut valve	
Refer to EC-492, "Component Inspection".	
Is the inspection result normal?	
YES >> GO TO 21.	
NO >> Replace refueling EVAP vapor cut valve with fuel tank.	
21.CHECK FUEL LEVEL SENSOR	
Refer to MWI-63, "Component Inspection".	

Revision: 2009 March **EC-295** 2009 FX35/FX50

Is the inspection result normal?

< DTC/CIRCUIT DIAGNOSIS >

YES >> GO TO 22.

NO >> Replace "fuel level sensor unit and fuel pump (main)".

22. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

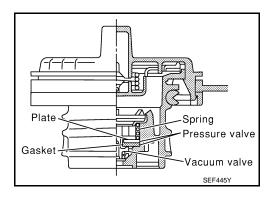
>> INSPECTION END

Component Inspection

INFOID:0000000003856174

1. CHECK FUEL FILLER CAP

- Turn ignition switch OFF.
- Remove fuel filler cap.
- Wipe clean valve housing.



- Install fuel filler cap adapter (commercial service tool) to fuel filler cap.
- Check valve opening pressure and vacuum.

Pressure: 15.3 - 20.0 kPa (0.156 - 0.204 kg/cm², 2.22 -

2.90 psi)

Vacuum: -6.0 to -3.3 kPa (-0.061 to -0.034 kg/cm²,

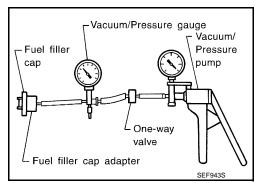
-0.87 to -0.48 psi)

Is the inspection result normal?

NO >> GO TO 2.

YES >> INSPECTION END

2. REPLACE FUEL FILLER CAP



Replace fuel filler cap.

CAUTION:

Use only a genuine fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the MIL may illuminate.

>> INSPECTION END

P0443 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

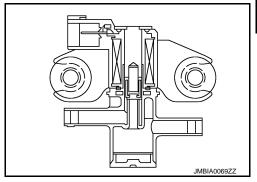
< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

P0443 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Description INFOID:0000000003856175

The EVAP canister purge volume control solenoid valve is used to control the flow rate of fuel vapor from the EVAP canister. The EVAP canister purge volume control solenoid valve is moved by ON/OFF pulses from the ECM. The longer the ON pulse, the greater the amount of fuel vapor that will flow through the valve.



DTC Logic INFOID:0000000003856176

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	G
P0443	EVAP canister purge volume control solenoid valve	The canister purge flow is detected during the specified driving conditions, even when EVAP canister purge volume control solenoid valve is completely closed.	EVAP control system pressure sensor EVAP canister purge volume control solenoid valve (The valve is stuck open.) EVAP canister vent control valve EVAP canister Hoses (Hoses are connected incorrectly or clogged.)	Н

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Always perform test at a temperature of 5°C (41°F) or more.

Will CONSULT-III be used?

YES >> GO TO 2.

NO >> GO TO 3.

2.PERFORM DTC CONFIRMATION PROCEDURE

(P)With CONSULT-III

- Start engine and warm it up to normal operating temperature.
- Turn ignition switch OFF and wait at least 10 seconds. 2.
- Turn ignition switch ON
- Turn ignition switch OFF and wait at least 10 seconds. 4.
- Turn ignition switch ON.
- 6. Select "PURG VOL CN/V P1444" of "EVAPORATIVE SYSTEM" in "DTC WORK SUPPORT" mode with CONSULT-III.
- Touch "START".
- Start engine and let it idle until "TESTING" on CONSULT-III changes to "COMPLETED". (It will take approximately 10 seconds.)

If "TESTING" is not displayed after 5 minutes, retry from step 2.

Touch "SELF-DIAG RESULTS".

Which is displayed on CONSULT-III screen?

EC-297 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

Ν

P0443 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS > [VQ35HR]

OK >> INSPECTION END

NG >> Go to EC-298, "Diagnosis Procedure".

3. PERFORM DTC CONFIRMATION PROCEDURE

With GST

- 1. Start engine and warm it up to normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Turn ignition switch ON.
- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Start engine and let it idle for at least 20 seconds.
- 6. Check 1st trip DTC.

Is 1st trip DTC displayed?

YES >> Go to EC-298, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003856177

1. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE POWER SUPPLY CIRCUIT

- Turn ignition switch OFF.
- 2. Disconnect EVAP canister purge volume control solenoid valve harness connector.
- 3. Turn ignition switch ON.
- 4. Check the voltage between EVAP canister purge volume control solenoid valve harness connector and ground.

EVAP canister purge volun	Ground	Voltage	
Connector Terminal		Ground	voltage
F7	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3. NO >> GO TO 2.

2. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E106, M6
- Harness connectors M116, F103
- Harness for open or short between EVAP canister purge volume control solenoid valve and IPDM E/R
- Harness for open or short between EVAP canister purge volume control solenoid valve and ECM
 - >> Repair open circuit, short to ground or short to power in harness or connectors.

3. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check the continuity between EVAP canister purge volume control solenoid valve harness connector and ECM harness connector.

EVAP canister purge volum	ECM		Continuity	
Connector Terminal		Connector	Terminal	Continuity
F7	2	F101	21	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

>> GO TO 4.

YES >> GO TO 5.

NO

4. DETECT MALFUNCTIONING PART

P0443 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE [VQ35HR1 < DTC/CIRCUIT DIAGNOSIS > Check the following. Harness connectors F104, F105 Α Harness for open or short between EVAP canister purge volume control solenoid valve and ECM >> Repair open circuit, short to ground or short to power in harness or connectors. EC 5.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR CONNECTOR Disconnect EVAP control system pressure sensor harness connector. Check connectors for water. Water should not exist. Is the inspection result normal? YES >> GO TO 6. NO >> Replace EVAP control system pressure sensor. Е O.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR Refer to EC-315, "Component Inspection", F Is the inspection result normal? YES-1 >> With CONSULT-III: GO TO 7. YES-2 >> Without CONSULT-III: GO TO 8. >> Replace EVAP control system pressure sensor. 7.CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE With CONSULT-III Н 1. Turn ignition switch OFF. Reconnect harness connectors disconnected. Start engine. Perform "PURG VOL CONT/V" in "ACTIVE TEST" mode with CONSULT-III. Check that engine speed varies according to the valve opening. Does engine speed vary according to the valve opening? YES >> GO TO 9. NO >> GO TO 8. $oldsymbol{\delta}$.CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE Refer to EC-300, "Component Inspection". Is the inspection result normal? YES >> GO TO 9. NO >> Replace EVAP canister purge volume control solenoid valve. CHECK RUBBER TUBE FOR CLOGGING 1. Disconnect rubber tube connected to EVAP canister vent control valve. Check the rubber tube for clogging.

Is the inspection result normal?

YES >> GO TO 10.

NO >> Clean the rubber tube using an air blower.

10.CHECK EVAP CANISTER VENT CONTROL VALVE

Refer to EC-307, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 11.

NO >> Replace EVAP canister vent control valve.

11. CHECK IF EVAP CANISTER IS SATURATED WITH WATER

 Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached. Ν

Р

P0443 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

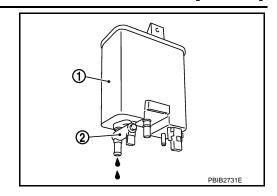
< DTC/CIRCUIT DIAGNOSIS >

Check if water will drain from EVAP canister (1).

2 : EVAP canister vent control valve

Does water drain from the EVAP canister?

YES >> GO TO 12. NO >> GO TO 14.



[VQ35HR]

12. CHECK EVAP CANISTER

Weigh the EVAP canister with the EVAP canister vent control valve and EVAP control system pressure sensor attached.

The weight should be less than 2.1 kg (4.6 lb).

Is the inspection result normal?

YES >> GO TO 14. NO >> GO TO 13.

13. DETECT MALFUNCTIONING PART

Check the following.

- EVAP canister for damage
- EVAP hose between EVAP canister and vehicle frame for clogging or poor connection

>> Repair hose or replace EVAP canister.

14. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

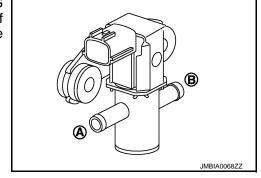
INFOID:0000000003856178

1. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

(P)With CONSULT-III

- 1. Turn ignition switch OFF.
- 2. Reconnect all harness connectors disconnected.
- 3. Disconnect EVAP purge hoses connected to EVAP canister purge volume control solenoid valve.
- 4. Turn ignition switch ON.
- 5. Select "PURG VOL CONT/V" in "ACTIVE TEST" mode with CONSULT-III.
- Touch "Qd" and "Qu" on CONSULT-III screen to adjust "PURG VOL CONT/V" opening and check air passage continuity of EVAP canister purge volume control solenoid valve under the following conditions.

Condition (PURG VOL CONT/V value)	Air passage continuity between (A) and (B)
100%	Existed
0%	Not existed



Without CONSULT-III

- Turn ignition switch OFF.
- Disconnect EVAP canister purge volume control solenoid valve harness connector.
- 3. Disconnect EVAP purge hoses connected to EVAP canister purge volume control solenoid valve.

P0443 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS > [VQ35HR]

4. Check air passage continuity of EVAP canister purge volume control solenoid valve under the following conditions.

Condition	Air passage continuity between (A) and (B)
12 V direct current supply between terminals 1 and 2	Existed
No supply	Not existed

JMBIA0068ZZ

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace EVAP canister purge volume control solenoid valve

С

Α

EC

D

Е

F

G

Н

Κ

L

M

Ν

0

Р

P0444, P0445 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

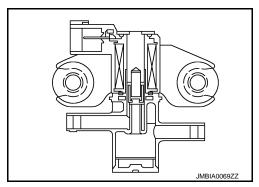
< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

P0444, P0445 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Description

The EVAP canister purge volume control solenoid valve is used to control the flow rate of fuel vapor from the EVAP canister. The EVAP canister purge volume control solenoid valve is moved by ON/OFF pulses from the ECM. The longer the ON pulse, the greater the amount of fuel vapor that will flow through the valve.



DTC Logic

INFOID:0000000003856180

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0444	EVAP canister purge volume control solenoid valve circuit open	An excessively low voltage signal is sent to ECM through the valve	Harness or connectors (The solenoid valve circuit is open or shorted.) EVAP canister purge volume control solenoid valve
P0445	EVAP canister purge volume control solenoid valve circuit shorted	An excessively high voltage signal is sent to ECM through the valve	Harness or connectors (The solenoid valve circuit is shorted.) EVAP canister purge volume control solenoid valve

DTC CONFIRMATION PROCEDURE

1.CONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm battery voltage is more than 11 V at idle.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- Start engine and let it idle for at least 13 seconds.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-302, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003856181

1.CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE POWER SUPPLY CIRCUIT

- Turn ignition switch OFF.
- 2. Disconnect EVAP canister purge volume control solenoid valve harness connector.
- Turn ignition switch ON.

P0444, P0445 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID **VALVE**

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Check the voltage between EVAP canister purge volume control solenoid valve harness connector and ground.

	ter purge vol- solenoid valve	Ground	Voltage
Connector Terminal			
F7	1	Ground	Battery voltage

EC

Α

Is the inspection result normal?

YES >> GO TO 3. NO >> GO TO 2.

D

Е

F

Н

2.DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E106, M6
- Harness connectors M116, F103
- Harness for open or short between EVAP canister purge volume control solenoid valve and IPDM E/R
- Harness for open or short between EVAP canister purge volume control solenoid valve and ECM

>> Repair open circuit, short to ground or short to power in harness or connectors.

3.CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- Disconnect ECM harness connector. 2.
- 3. Check the continuity between EVAP canister purge volume control solenoid valve harness connector and ECM harness connector.

EVAP canister purge vol- ume control solenoid valve		ECM		Continuity
Connector	Terminal	Connector	Terminal	
F7	2	F101	21	Existed

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES-1 >> With CONSULT-III: GO TO 5.

YES-2 >> Without CONSULT-III: GO TO 6.

NO >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F104, F105
- Harness for open or short between EVAP canister purge volume control solenoid valve and ECM

>> Repair open circuit, short to ground or short to power in harness or connectors.

${f 5}$.CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

(P)With CONSULT-III

- Reconnect all harness connectors disconnected.
- 2. Start engine.
- 3. Perform "PURG VOL CONT/V" in "ACTIVE TEST" mode with CONSULT-III. Check that engine speed varies according to the valve opening.

Does engine speed vary according to the valve opening?

YES >> GO TO 7.

NO >> GO TO 6.

6.CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-304, "Component Inspection".

EC-303 Revision: 2009 March 2009 FX35/FX50

N

P0444, P0445 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace EVAP canister purge volume control solenoid valve.

7. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

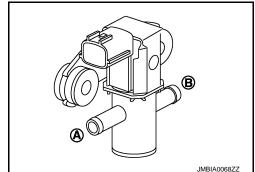
INFOID:0000000003856182

1. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

(P)With CONSULT-III

- Turn ignition switch OFF.
- 2. Reconnect all harness connectors disconnected.
- 3. Disconnect EVAP purge hoses connected to EVAP canister purge volume control solenoid valve.
- Turn ignition switch ON.
- 5. Select "PURG VOL CONT/V" in "ACTIVE TEST" mode with CONSULT-III.
- Touch "Qd" and "Qu" on CONSULT-III screen to adjust "PURG VOL CONT/V" opening and check air passage continuity of EVAP canister purge volume control solenoid valve under the following conditions.

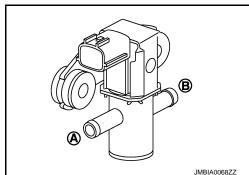
Condition (PURG VOL CONT/V value)	Air passage continuity between (A) and (B)
100%	Existed
0%	Not existed



Without CONSULT-III

- 1. Turn ignition switch OFF.
- 2. Disconnect EVAP canister purge volume control solenoid valve harness connector.
- 3. Disconnect EVAP purge hoses connected to EVAP canister purge volume control solenoid valve.
- 4. Check air passage continuity of EVAP canister purge volume control solenoid valve under the following conditions.

Condition	Air passage continuity between (A) and (B)
12 V direct current supply between terminals 1 and 2	Existed
No supply	Not existed



Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace EVAP canister purge volume control solenoid valve

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

P0447 EVAP CANISTER VENT CONTROL VALVE

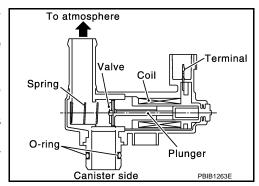
Description

The EVAP canister vent control valve is located on the EVAP canister and is used to seal the canister vent.

This solenoid valve responds to signals from the ECM. When the ECM sends an ON signal, the coil in the solenoid valve is energized. A plunger will then move to seal the canister vent. The ability to seal the vent is necessary for the on board diagnosis of other evaporative emission control system components.

This solenoid valve is used only for diagnosis, and usually remains opened.

When the vent is closed, under normal purge conditions, the evaporative emission control system is depressurized and allows "EVAP Control System" diagnosis.



DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0447	EVAP canister vent control valve circuit open	An improper voltage signal is sent to ECM through EVAP canister vent control valve.	Harness or connectors (The valve circuit is open or shorted.) EVAP canister vent control valve

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm battery voltage is more than 11 V at idle.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine and wait at least 8 seconds.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-305, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1. INSPECTION START

Will CONSULT-III be used?

Will CONSULT-III be used?

YES >> GO TO 2. NO >> GO TO 3.

2.CHECK EVAP CANISTER VENT CONTROL VALVE CIRCUIT

(II) With CONSULT-III

- Turn ignition switch OFF and then ON.
- Select "VENT CONTROL/V" in "ACTIVE TEST" mode with CONSULT-III.

EC

Α

D

_

K

L

IV.

M

Ν

INFOID:0000000003856185

C

Р

F

Revision: 2009 March EC-305 2009 FX35/FX50

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

- 3. Touch "ON/OFF" on CONSULT-III screen.
- 4. Check for operating sound of the valve.

Clicking sound should be heard.

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 3.

3. CHECK EVAP CANISTER VENT CONTROL VALVE POWER SUPPLY CIRCUIT

- Turn ignition switch OFF.
- 2. Disconnect EVAP canister vent control valve harness connector.
- 3. Turn ignition switch ON.
- 4. Check the voltage between EVAP canister vent control valve harness connector and ground.

EVAP canister vent con- trol valve		Ground	Voltage
Connector	Terminal		
B253	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 5. NO >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- · Harness connectors E3, F1
- Harness connectors F103, M116
- Harness connectors B201, M117
- Harness for open or short between EVAP canister vent control valve and IPDM E/R
 - >> Repair open circuit, short to ground or short to power in harness or connectors.

${f 5.}$ CHECK EVAP CANISTER VENT CONTROL VALVE OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check the continuity between EVAP canister vent control valve harness connector and ECM harness connector.

EVAP canister vent control valve		ECM		Continuity
Connector	Terminal	Connector	Terminal	
B253	2	M107	121	Existed

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B201, M117
- Harness for open or short between EVAP canister vent control valve and ECM
 - >> Repair open circuit, short to ground or short to power in harness or connectors.

7. CHECK RUBBER TUBE FOR CLOGGING

- Disconnect rubber tube connected to EVAP canister vent control valve.
- 2. Check the rubber tube for clogging.

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 8.

NO >> Clean the rubber tube using an air blower.

8.CHECK EVAP CANISTER VENT CONTROL VALVE

Refer to EC-307, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace EVAP canister vent control valve.

9. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

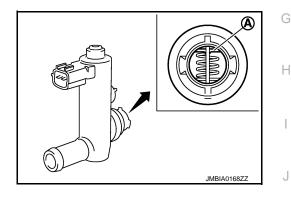
1. CHECK EVAP CANISTER VENT CONTROL VALVE-I

- 1. Turn ignition switch OFF.
- 2. Remove EVAP canister vent control valve from EVAP canister.
- 3. Check portion (A) of EVAP canister vent control valve for rust.

Is it rusted?

YES >> Replace EVAP canister vent control valve

NO >> GO TO 2.



[VQ35HR]

INFOID:0000000003856186

Α

EC

D

Е

$2.\mathsf{CHECK}$ EVAP CANISTER VENT CONTROL VALVE-II

With CONSULT-III

- 1. Reconnect harness connectors disconnected.
- Turn ignition switch ON.
- 3. Perform "VENT CONTROL/V" in "ACTIVE TEST" mode.
- 4. Check air passage continuity and operation delay time.

Check that new O-ring is installed properly.

VENT CONTROL/V Condition	Air passage continuity between (A) and (B)
ON	Not existed
OFF	Existed

Operation takes less than 1 second.

⊗Without CONSULT-III

- 1. Disconnect EVAP canister vent control valve harness connector.
- 2. Check air passage continuity and operation delay time under the following conditions.

Check that new O-ring is installed properly.

Condition	Air passage continuity between (A) and (B)
12 V direct current supply between terminals 1 and 2	Not existed
OFF	Existed

Operation takes less than 1 second.

Is the inspection result normal?

MBIA0169ZZ

M

K

Ν

0

Р

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

YES >> INSPECTION END

NO >> GO TO 3.

3.CHECK EVAP CANISTER VENT CONTROL VALVE-III

(I) With CONSULT-III

- 1. Clean the air passage [portion (A) to (B)] of EVAP canister vent control valve using an air blower.
- 2. Perform "VENT CONTROL/V" in "ACTIVE TEST" mode.
- 3. Check air passage continuity and operation delay time.

Check that new O-ring is installed properly.

VENT CONTROL/V Condition	Air passage continuity between (A) and (B)
ON	Not existed
OFF	Existed

Operation takes less than 1 second.

⋈Without CONSULT-III

- 1. Clean the air passage [portion (A) to (B)] of EVAP canister vent control valve using an air blower.
- 2. Check air passage continuity and operation delay time under the following conditions.

Check that new O-ring is installed properly.

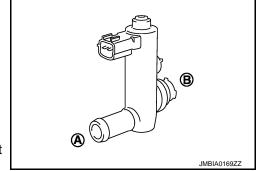
Condition	Air passage continuity between (A) and (B)
12 V direct current supply between terminals 1 and 2	Not existed
OFF	Existed

Operation takes less than 1 second.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace EVAP canister vent control valve



[VQ35HR]

P0448 EVAP CANISTER VENT CONTROL VALVE

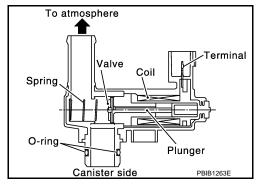
Description

The EVAP canister vent control valve is located on the EVAP canister and is used to seal the canister vent.

This solenoid valve responds to signals from the ECM. When the ECM sends an ON signal, the coil in the solenoid valve is energized. A plunger will then move to seal the canister vent. The ability to seal the vent is necessary for the on board diagnosis of other evaporative emission control system components.

This solenoid valve is used only for diagnosis, and usually remains opened.

When the vent is closed, under normal purge conditions, the evaporative emission control system is depressurized and allows "EVAP Control System" diagnosis.



DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	
P0448	EVAP canister vent control valve close	EVAP canister vent control valve remains closed under specified driving conditions.	EVAP canister vent control valve EVAP control system pressure sensor and the circuit Blocked rubber tube to EVAP canister vent control valve EVAP canister is saturated with water	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Turn ignition switch ON and wait at least 5 seconds.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Start engine and let it idle for at least 1 minute.
- 4. Repeat next procedures 3 times.
- Increase the engine speed up to between 3,000 and 3,500 rpm and maintain that speed for 2 minutes and 50 seconds to 3 minutes.

Do not exceed 3 minutes.

- Fully released accelerator pedal and keep engine idle for approximately 5 seconds.
- 5. Repeat next procedure 20 times.
- Quickly increase the engine speed up to between 4,000 and 4,500 rpm and maintain that speed for 25 to 30 seconds.

EC

Α

D

Е

F

Н

ı

J

K

L

M

N

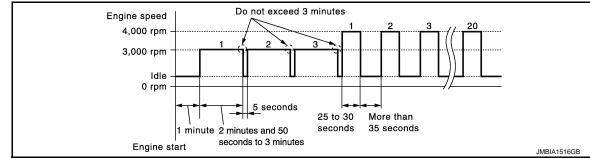
0

Р

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Fully released accelerator pedal and keep engine idle for at least 35 seconds.



6. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-310, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003856189

1. CHECK RUBBER TUBE

- 1. Turn ignition switch OFF.
- 2. Disconnect rubber tube connected to EVAP canister vent control valve.
- 3. Check the rubber tube for clogging.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Clean rubber tube using an air blower.

2. CHECK EVAP CANISTER VENT CONTROL VALVE

Refer to EC-311, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace EVAP canister vent control valve.

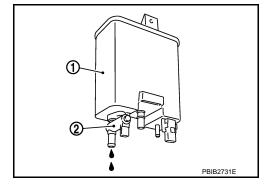
${f 3}.$ CHECK IF EVAP CANISTER IS SATURATED WITH WATER

- Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
- 2. Check if water will drain from the EVAP canister (1).

2 : EVAP canister vent control valve

Does water drain from EVAP canister?

YES >> GO TO 4. NO >> GO TO 6.



4. CHECK EVAP CANISTER

Weigh the EVAP canister with the EVAP canister vent control valve and EVAP control system pressure sensor attached.

The weight should be less than 2.1 kg (4.6 lb).

Is the inspection result normal?

YES >> GO TO 6. NO >> GO TO 5.

DETECT MALFUNCTIONING PART

Check the following.

EVAP canister for damage

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

- EVAP hose between EVAP canister and vehicle frame for clogging or poor connection
 - >> Repair hose or replace EVAP canister.

6.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR CONNECTOR

- Disconnect EVAP control system pressure sensor harness connector.
- Check connectors for water.

Water should not exist.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace EVAP control system pressure sensor.

7. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-315, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 8.

NO >> Replace EVAP control system pressure sensor.

8. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

1. CHECK EVAP CANISTER VENT CONTROL VALVE-I

1. Turn ignition switch OFF.

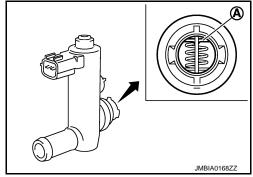
Component Inspection

- Remove EVAP canister vent control valve from EVAP canister.
- Check portion (A) of EVAP canister vent control valve for being rusted.

Is it rusted?

YES >> Replace EVAP canister vent control valve

NO >> GO TO 2.



2.CHECK EVAP CANISTER VENT CONTROL VALVE-II

(P)With CONSULT-III

- 1. Reconnect harness connectors disconnected.
- Turn ignition switch ON.
- 3. Perform "VENT CONTROL/V" in "ACTIVE TEST" mode.
- 4. Check air passage continuity and operation delay time.

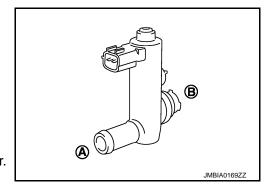
Check new O-ring is installed properly.

VENT CONTROL/V Condition	Air passage continuity between (A) and (B)
ON	Not existed
OFF	Existed

Operation takes less than 1 second.

Without CONSULT-III

1. Disconnect EVAP canister vent control valve harness connector.



EC

Α

D

Е

F

G

Н

INFOID:0000000003856190

- 1

J

K

L

Ν

0

Р

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Check air passage continuity and operation delay time under the following conditions.Check new O-ring is installed properly.

Condition	Air passage continuity between (A) and (B)
12 V direct current supply between terminals 1 and 2	Not existed
OFF	Existed

Operation takes less than 1 second.

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 3.

3.check evap canister vent control valve-iii

(II) With CONSULT-III

- 1. Clean the air passage [portion (A) to (B)] of EVAP canister vent control valve using an air blower.
- 2. Perform "VENT CONTROL/V" in "ACTIVE TEST" mode.
- 3. Check air passage continuity and operation delay time.

Check new O-ring is installed properly.

VENT CONTROL/V Condition	Air passage continuity between (A) and (B)
ON	Not existed
OFF	Existed

Operation takes less than 1 second.

Without CONSULT-III

- 1. Clean the air passage [portion (A) to (B)] of EVAP canister vent control valve using an air blower.
- 2. Check air passage continuity and operation delay time under the following conditions.

Check new O-ring is installed properly.

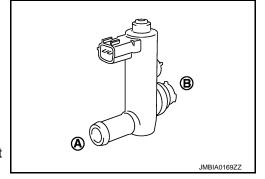
Condition	Air passage continuity between (A) and (B)
12 V direct current supply between terminals 1 and 2	Not existed
OFF	Existed

Operation takes less than 1 second.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace EVAP canister vent control valve



< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Α

D

Е

F

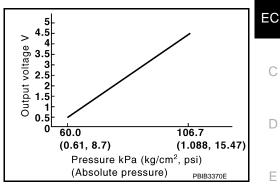
M

Р

P0451 EVAP CONTROL SYSTEM PRESSURE SENSOR

Description INFOID:0000000003856191

The EVAP control system pressure sensor detects pressure in the purge line. The sensor output voltage to the ECM increases as pressure increases.



DTC Logic INFOID:0000000003856192

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0451	EVAP control system pressure sensor performance	ECM detects a sloshing signal from the EVAP control system pressure sensor	Harness or connectors (EVAP control system pressure sensor circuit is shorted.) [Crankshaft position (CKP) sensor circuit is shorted.] [Camshaft position (CMP) sensor (bank 2) circuit is shorted.] [Exhaust valve timing (EVT) control position sensor (bank 2) circuit is shorted.] (Battery current sensor circuit is shorted.) [Accelerator pedal position (APP) sensor 2 circuit is shorted.] (Refrigerant pressure sensor circuit is shorted.) EVAP control system pressure sensor CKP sensor CKP sensor (bank 2) EVT control position sensor (bank 2) Battery current sensor APP sensor Refrigerant pressure sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and wait at least 40 seconds.

NOTE:

Do not depress accelerator pedal even slightly.

2. Check 1st trip DTC.

Is 1st trip DTC detected?

EC-313 Revision: 2009 March 2009 FX35/FX50

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

YES >> Go to EC-314, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003856193

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- 2. Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR CONNECTOR FOR WATER

- 1. Disconnect EVAP control system pressure sensor harness connector.
- 2. Check sensor harness connector for water.

Water should not exist.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace harness connector.

3.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT

- 1. Turn ignition switch ON.
- Check the voltage between EVAP control system pressure sensor harness connector and ground.

	trol system e sensor	Ground	Voltage (V)
Connector	Terminal		
B252	3	Ground	Approx. 5

Is the inspection result normal?

YES >> GO TO 8.

NO >> GO TO 4.

4. CHECK SENSOR POWER SUPPLY CIRCUIT

Check harness for short to power and short to ground, between the following terminals.

ECM		Sensor			
Connector	Terminal	Name	Connector	Terminal	
F101	46	Crankshaft position (CKP) sensor	F2	1	
	64	Camshaft position (CMP) sensor (bank 2)		F18	1
F102		Exhaust valve timing (EVT) control position sensor (bank 2)	F19	1	
		Battery current sensor	E21	1	
	103	102	Accelerator pedal position (APP) sensor	E112 (Without ICC)	6
M107		Accelerator pedar position (AFF) sensor	E116 (With ICC)	3	
	107	EVAP control system pressure sensor	B252	3	
	111	Refrigerant pressure sensor	E77	3	
		14 10			

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair short to ground or short to power in harness or connectors.

[VQ35HR] < DTC/CIRCUIT DIAGNOSIS > 5. CHECK COMPONENTS Check the following. CKP sensor (Refer to <u>EC-273, "Component Inspection"</u>.) • CMP sensor (bank 2) (Refer to EC-279, "Component Inspection".) EC • EVT control position sensor (bank 2) (Refer to EC-371, "Component Inspection".) Battery current sensor (Refer to EC-402, "Component Inspection".) Refrigerant pressure sensor (Refer to <u>HAC-85</u>, "<u>Diagnosis Procedure</u>".) Is the inspection result normal? YES >> GO TO 6. NO >> Replace malfunctioning component. D O.CHECK APP SENSOR Refer to EC-446, "Component Inspection". Is the inspection result normal? Е YES >> GO TO 9. NO >> GO TO 7. 7. REPLACE ACCELERATOR PEDAL ASSEMBLY Replace accelerator pedal assembly Go to EC-447, "Special Repair Requirement". >> INSPECTION END 8.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR Refer to EC-315, "Component Inspection". Is the inspection result normal? YES >> GO TO 9. NO >> Replace EVAP control system pressure sensor. 9. CHECK INTERMITTENT INCIDENT Refer to GI-35, "Intermittent Incident". >> INSPECTION END K Component Inspection INFOID:0000000003856194 1. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR 1. Turn ignition switch OFF. 2. Remove EVAP control system pressure sensor with its harness connector. Always replace O-ring with a new one. Install a vacuum pump to EVAP control system pressure sensor. Turn ignition switch ON and check output voltage between ECM harness connector terminals under the following conditions. Ν **ECM** Condition Voltage (V) [Applied vacuum kPa (kg/cm², psi)] Connector **Terminal Terminal**

CAUTION

M107

• Always calibrate the vacuum pump gauge when using it.

112

Never apply below -93.3 kPa (-0.952 kg/cm², -13.53 psi) or pressure over 101.3 kPa (1.033 kg/cm², 14.69 psi).

1.8 - 4.8

2.1 to 2.5 lower than above value

Р

Not applied

-26.7 (-0.272, -3.87)

Is the inspection result normal?

102

< DTC/CIRCUIT DIAGNOSIS > [VQ35HR]

YES >> INSPECTION END

NO >> Replace EVAP control system pressure sensor

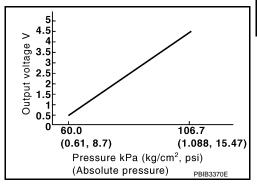
< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

P0452 EVAP CONTROL SYSTEM PRESSURE SENSOR

Description INFOID:0000000003856195

The EVAP control system pressure sensor detects pressure in the purge line. The sensor output voltage to the ECM increases as pressure increases.



DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0452	EVAP control system pressure sensor low input	An excessively low voltage from the sensor is sent to ECM.	Harness or connectors (EVAP control system pressure sensor circuit is open or shorted.) [Crankshaft position (CKP) sensor circuit is shorted.] [Camshaft position (CMP) sensor (bank 2) circuit is shorted.] [Exhaust valve timing (EVT) control position sensor (bank 2) circuit is shorted.] (Battery current sensor circuit is shorted.) [Accelerator pedal (APP) sensor 2 circuit is shorted.] (Refrigerant pressure sensor circuit is shorted.) EVAP control system pressure sensor CKP sensor CKP sensor CMP sensor (bank 2) EVT control position sensor (bank 2) Battery current sensor APP sensor Refrigerant pressure sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Always perform test at a temperature of 5°C (41°F) or more.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

(P)With CONSULT-III

- 1. Start engine and warm it up to normal operating temperature.
- Turn ignition switch OFF and wait at least 10 seconds. 2.
- Turn ignition switch ON.

EC-317 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

F

M

Р

INFOID:0000000003856196

Е

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Turn ignition switch ON.
- 6. Select "DATA MONITOR" mode with CONSULT-III.
- 7. Check that "FUEL T/TMP SE" is more than 0°C (32°F).
- 8. Start engine and wait at least 20 seconds.
- 9. Check 1st trip DTC.

With GST

- . Start engine and warm it up to normal operating temperature.
- 2. Set voltmeter probes to ECM harness connector terminals under the following conditions.

	ECM	
Connector	+	_
Connector	Terminal	Terminal
M107	106 (Fuel tank temperature sensor signal)	128

- 3. Check that the voltage is less than 4.2 V.
- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Turn ignition switch ON.
- 6. Turn ignition switch OFF and wait at least 10 seconds.
- 7. Start engine and wait at least 20 seconds.
- 8. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-318, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003856197

1. CHECK GROUND CONNECTION

- Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2. CHECK CONNECTOR

- 1. Disconnect EVAP control system pressure sensor harness connector.
- Check sensor harness connector for water.

Water should not exist.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace harness connector.

3.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT-I

- 1. Turn ignition switch ON.
- 2. Check the voltage between EVAP control system pressure sensor harness connector and ground.

	trol system e sensor	Ground	Voltage (V)
Connector	Terminal		
B252	3	Ground	Approx. 5

Is the inspection result normal?

YES >> GO TO 10. NO >> GO TO 4.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

4.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT-II

- Turn ignition switch OFF.
- Disconnect ECM harness connector.
- Check the continuity between EVAP control system pressure sensor harness connector and ECM harness connector.

EC

Α

EVAP cont pressure	,	EC	Continuity	
Connector	Terminal	Connector	Terminal	
B252	3	M107	107	Existed

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 5. Е

D

${f 5.}$ DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B201, M117
- Harness for open between ECM and EVAP control system pressure sensor

>> Repair open circuit.

Н

F

6.CHECK SENSOR POWER SUPPLY CIRCUIT

Check harness for short to power and short to ground, between the following terminals.

ECM Sensor Connector Terminal Name Connector **Terminal** F101 46 Crankshaft position (CKP) sensor F2 1 Camshaft position (CMP) sensor (bank F18 1 F102 64 Exhaust valve timing (EVT) control posi-F19 1 tion sensor (bank 2) Battery current sensor E21 1 E112 6 (Without ICC) 103 Accelerator pedal position (APP) sensor E116 3 M107 (With ICC) 107 B252 EVAP control system pressure sensor 3 111 E77 3 Refrigerant pressure sensor

Is the inspection result normal?

YES >> GO TO 7.

>> Repair short to ground or short to power in harness or connectors.

.CHECK COMPONENTS

Check the following.

NO

- CKP sensor (Refer to <u>EC-273, "Component Inspection"</u>.)
- CMP sensor (bank 2) (Refer to EC-279, "Component Inspection".)
- EVT control position sensor (bank 2) (Refer to EC-371, "Component Inspection".)
- Battery current sensor (Refer to EC-402, "Component Inspection".)
- Refrigerant pressure sensor (Refer to <u>HAC-85</u>, "<u>Diagnosis Procedure</u>".)

Is the inspection result normal?

YES >> GO TO 8.

NO >> Replace malfunctioning component.

8.CHECK APP SENSOR

EC-319 Revision: 2009 March 2009 FX35/FX50

N

Р

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Refer to EC-446, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 15. NO >> GO TO 9.

9. REPLACE ACCELERATOR PEDAL ASSEMBLY

- 1. Replace accelerator pedal assembly
- 2. Go to EC-447, "Special Repair Requirement".

>> INSPECTION END

10.check evap control system pressure sensor ground circuit for open and short

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check the continuity between EVAP control system pressure sensor harness connector and ECM harness connector.

EVAP cont	•	ECM		Continuity
Connector	Terminal	Connector	Terminal	
B252	1	M107	112	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 12. NO >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B201, M117
- Harness for open or short between EVAP control system pressure sensor and ECM
 - >> Repair open circuit, short to ground or short to power in harness or connectors.

12. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

Check the continuity between EVAP control system pressure sensor harness connector and ECM harness connector.

EVAP control	,	EC	Continuity	
Connector	Terminal	Connector	Terminal	
B252	2	M107	102	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 14. NO >> GO TO 13.

13. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B201, M117
- Harness for open or short between EVAP control system pressure sensor and ECM
 - >> Repair open circuit, short to ground or short to power in harness or connectors.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

14. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-321, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 15.

NO >> Replace EVAP control system pressure sensor.

15. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000003856198

1. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

- Turn ignition switch OFF.
- 2. Remove EVAP control system pressure sensor with its harness connector connected from EVAP canister. Always replace O-ring with a new one.
- 3. Install a vacuum pump to EVAP control system pressure sensor.
- 4. Turn ignition switch ON and check output voltage between ECM harness connector terminals under the following conditions.

ECM			Condition		
Connector	+ -		Condition [Applied vacuum kPa (kg/cm ² , psi)]	Voltage (V)	
Connector	Terminal	Terminal	[, tppilod raddalli iti a (itg/dili ; pol/]		
M107	102	112	Not applied	1.8 - 4.8	
IVI I U 7	102 112	-26.7 (-0.272, -3.87)	2.1 to 2.5 lower than above value		

CAUTION:

- · Always calibrate the vacuum pump gauge when using it.
- Never apply below -93.3 kPa (-0.952 kg/cm², -13.53 psi) or pressure over 101.3 kPa (1.033 kg/cm², 14.69 psi).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace EVAP control system pressure sensor K

Ν

Р

EC-321 Revision: 2009 March 2009 FX35/FX50

EC

D

Е

F

Н

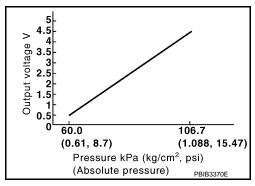
[VQ35HR]

INFOID:0000000003856200

P0453 EVAP CONTROL SYSTEM PRESSURE SENSOR

Description INFOID:000000003856199

The EVAP control system pressure sensor detects pressure in the purge line. The sensor output voltage to the ECM increases as pressure increases.



DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0453	EVAP control system pressure sensor high input	An excessively high voltage from the sensor is sent to ECM.	Harness or connectors (EVAP control system pressure sensor circuit is open or shorted.) [Crankshaft position (CKP) sensor circuit is shorted.] [Camshaft position (CMP) sensor (bank 2) circuit is shorted.] [Exhaust valve timing (EVT) control position sensor (bank 2) circuit is shorted.] (Battery current sensor circuit is shorted.) [Accelerator pedal position (APP) sensor 2 circuit is shorted.] (Refrigerant pressure sensor circuit is shorted.) EVAP control system pressure sensor CKP sensor CMP sensor (bank 2) EVT control position sensor (bank 2) Battery current sensor APP sensor Refrigerant pressure sensor EVAP canister vent control valve EVAP canister Rubber hose from EVAP canister vent control valve to vehicle frame

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Always perform test at a temperature of 5°C (41°F) or more.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

Revision: 2009 March EC-322 2009 FX35/FX50

P0453 EVAP CONTROL SYSTEM PRESSURE SENSOR [VQ35HR] < DTC/CIRCUIT DIAGNOSIS > (P)With CONSULT-III Α Start engine and warm it up to normal operating temperature. 2. Turn ignition switch OFF and wait at least 10 seconds. Turn ignition switch ON. 3. 4. Turn ignition switch OFF and wait at least 10 seconds. EC 5. Turn ignition switch ON. Select "DATA MONITOR" mode with CONSULT-III. Check that "FUEL T/TMP SE" is more than 0°C (32°F). Start engine and wait at least 20 seconds. 9. Check 1st trip DTC. With GST 1. Start engine and warm it up to normal operating temperature. D Set voltmeter probes to ECM harness connector terminals under the following conditions. **ECM** Е + Connector **Terminal** Terminal 106 M107 128 (Fuel tank temperature sensor signal) Check that the voltage is less than 4.2 V. 4. Turn ignition switch OFF and wait at least 10 seconds. Turn ignition switch ON. Turn ignition switch OFF and wait at least 10 seconds. Start engine and wait at least 20 seconds. Check 1st trip DTC. Is 1st trip DTC detected? YES >> Go to EC-323, "Diagnosis Procedure". >> INSPECTION END NO Diagnosis Procedure INFOID:0000000003856201 1. CHECK GROUND CONNECTION Turn ignition switch OFF. Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection". Is the inspection result normal? YES >> GO TO 2. NO >> Repair or replace ground connection. 2. CHECK CONNECTOR Disconnect EVAP control system pressure sensor harness connector. Check that water is not inside connectors. Is the inspection result normal? N

YES >> GO TO 3.

NO >> Repair or replace harness connector.

3.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT-I

- Turn ignition switch ON.
- Check the voltage between EVAP control system pressure sensor harness connector and ground.

Р

EVAP control system	Ground	Voltage (V)	
Connector Terminal			
B252	3	Ground	Approx. 5

Is the inspection result normal?

YES >> GO TO 10.

NO >> GO TO 4.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

4.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT-II

- Turn ignition switch OFF.
- Disconnect ECM harness connector.
- Check the continuity between EVAP control system pressure sensor harness connector and ECM harness connector.

EVAP control system pressure sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	
B252	3	M107	107	Existed

Is the inspection result normal?

YES >> GO TO 6. NO >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B201, M117
- · Harness for open between ECM and EVAP control system pressure sensor

>> Repair open circuit.

6.CHECK SENSOR POWER SUPPLY CIRCUIT

Check harness for short to power and short to ground, between the following terminals.

ECM		Sensor				
Connector	Terminal	Name	Connector	Terminal		
F101	46	Crankshaft position (CKP) sensor F2		1		
F102 6		Camshaft position (CMP) sensor (bank 2)	F18	1		
	64	Exhaust valve timing (EVT) control position sensor (bank 2)	F19	1		
		Battery current sensor	E21	1		
103 M107 107 111	Accelerator pedal position (APP) sensor	E112 (Without ICC)	6			
	103	Accelerator pedar position (AFF) sensor	E116 (With ICC)	3		
	107	EVAP control system pressure sensor	B252	3		
	111	Refrigerant pressure sensor	E77	3		

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair short to ground or short to power in harness or connectors.

.CHECK COMPONENTS

Check the following.

- CKP sensor (Refer to EC-273, "Component Inspection".)
- CMP sensor (bank 2) (Refer to <u>EC-279</u>, "<u>Component Inspection</u>".)
 EVT control position sensor (bank 2) (Refer to <u>EC-371</u>, "<u>Component Inspection</u>".)
- Battery current sensor (Refer to EC-402, "Component Inspection".)
- Refrigerant pressure sensor (Refer to <u>HAC-85</u>, "<u>Diagnosis Procedure</u>".)

Is the inspection result normal?

YES >> GO TO 8.

NO >> Replace malfunctioning component.

8.CHECK APP SENSOR

P0453 EVAP CONTROL SYSTEM PRESSURE SENSOR [VQ35HR] < DTC/CIRCUIT DIAGNOSIS > Refer to EC-446, "Component Inspection". Α Is the inspection result normal? YES >> GO TO 20. NO >> GO TO 9. EC 9. REPLACE ACCELERATOR PEDAL ASSEMBLY Replace accelerator pedal assembly Go to EC-447, "Special Repair Requirement". >> INSPECTION END 10.check evap control system pressure sensor ground circuit for open and SHORT Turn ignition switch OFF. Е Disconnect ECM harness connector. Check the continuity between EVAP control system pressure sensor harness connector and ECM harness connector. F EVAP control system pressure sensor **ECM** Continuity Connector **Terminal** Connector **Terminal** B252 112 M107 Existed Also check harness for short to ground and short to power. Is the inspection result normal? YES >> GO TO 12. NO >> GO TO 11. 11. DETECT MALFUNCTIONING PART Check the following. Harness connectors B201, M117 Harness for open or short between EVAP control system pressure sensor and ECM >> Repair open circuit, short to ground or short to power in harness or connectors. 12.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT Check the continuity between EVAP control system pressure sensor harness connector and ECM harness connector. EVAP control system pressure sensor **ECM** M Continuity Connector Terminal Connector **Terminal** B252 2 M107 102 Existed N Also check harness for short to ground and short to power. Is the inspection result normal? YES >> GO TO 14. NO >> GO TO 13. 13.detect malfunctioning part Check the following.

- Harness connectors B201, M117
- Harness for open or short between EVAP control system pressure sensor and ECM
 - >> Repair open circuit, short to ground or short to power in harness or connectors.

14. CHECK RUBBER TUBE

1. Disconnect rubber tube connected to EVAP canister vent control valve.

Revision: 2009 March EC-325 2009 FX35/FX50

P0453 EVAP CONTROL SYSTEM PRESSURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

2. Check the rubber tube for clogging.

Is the inspection result normal?

YES >> GO TO 15.

NO >> Clean the rubber tube using an air blower, repair or replace rubber tube.

15. CHECK EVAP CANISTER VENT CONTROL VALVE

Refer to EC-307, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 16.

NO >> Replace EVAP canister vent control valve.

16. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-326, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 17.

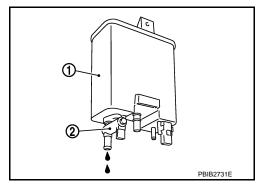
NO >> Replace EVAP control system pressure sensor.

17. CHECK IF EVAP CANISTER IS SATURATED WITH WATER

- Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
- 2. Check if water will drain from the EVAP canister (1).
 - 2 : EVAP canister vent control valve

Does water drain from EVAP canister?

YES >> GO TO 18. NO >> GO TO 20.



18. CHECK EVAP CANISTER

Weigh the EVAP canister with the EVAP canister vent control valve and EVAP control system pressure sensor attached.

The weight should be less than 2.1 kg (4.6 lb).

Is the inspection result normal?

YES >> GO TO 20. NO >> GO TO 19.

19. DETECT MALFUNCTIONING PART

Check the following.

- EVAP canister for damage
- EVAP hose between EVAP canister and vehicle frame for clogging or poor connection

>> Repair hose or replace EVAP canister.

20. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000003856202

1. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

- Turn ignition switch OFF.
- Remove EVAP control system pressure sensor with its harness connector connected from EVAP canister.

Revision: 2009 March EC-326 2009 FX35/FX50

P0453 EVAP CONTROL SYSTEM PRESSURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Always replace O-ring with a new one.

- 3. Install a vacuum pump to EVAP control system pressure sensor.
- 4. Turn ignition switch ON and check output voltage between ECM harness connector terminals under the following conditions.

ECM			Condition	
Connector	+	_	Condition [Applied vacuum kPa (kg/cm ² , psi)]	Voltage (V)
Connector	Terminal	Terminal		
M107	102	112	Not applied	1.8 - 4.8
WITOT	102	112	-26.7 (-0.272, -3.87)	2.1 to 2.5 lower than above value

CAUTION:

- Always calibrate the vacuum pump gauge when using it.
- Never apply below -93.3 kPa (-0.952 kg/cm², -13.53 psi) or pressure over 101.3 kPa (1.033 kg/cm², 14.69 psi).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace EVAP control system pressure sensor

EC

Α

D

F

Н

J

Κ

L

M

Ν

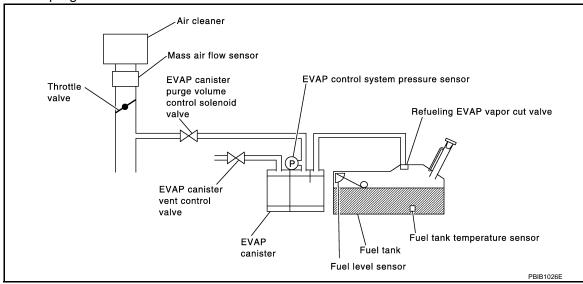
0

Р

DTC Logic

DTC DETECTION LOGIC

This diagnosis detects a very large leak (fuel filler cap fell off etc.) in EVAP system between the fuel tank and EVAP canister purge volume control solenoid valve.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0455	EVAP control system gross leak detected	EVAP control system has a very large leak such as fuel filler cap fell off, EVAP control system does not operate properly.	Fuel filler cap remains open or does not close. Incorrect fuel tank vacuum relief valve Incorrect fuel filler cap used Foreign matter caught in fuel filler cap. Leak is in line between intake manifold and EVAP canister purge volume control solenoid valve. Foreign matter caught in EVAP canister vent control valve. EVAP canister or fuel tank leaks EVAP purge line (pipe and rubber tube) leaks EVAP purge line rubber tube bent. Loose or disconnected rubber tube EVAP canister vent control valve and the circuit EVAP canister purge volume control solenoid valve and the circuit Fuel tank temperature sensor O-ring of EVAP canister vent control valve is missing or damaged. EVAP control system pressure sensor Refueling EVAP vapor cut valve ORVR system leaks

CAUTION:

- Use only a genuine NISSAN fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the MIL may illuminate.
- If the fuel filler cap is not tightened properly, the MIL may illuminate.
- Use only a genuine NISSAN rubber tube as a replacement.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

CAUTION:

Revision: 2009 March **EC-328** 2009 FX35/FX50

[VQ35HR] < DTC/CIRCUIT DIAGNOSIS > Never remove fuel filler cap during the DTC Confirmation Procedure. If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test. 1. Turn ignition switch OFF and wait at least 10 seconds. Turn ignition switch ON. EC Turn ignition switch OFF and wait at least 10 seconds. NOTE: Check that EVAP hoses are connected to EVAP canister purge volume control solenoid valve properly. Will CONSULT-III be used? YES >> GO TO 2. NO >> GO TO 4. D 2.perform dtc confirmation procedure With CONSULT-III **TESTING CONDITION:** Е • Perform "DTC WORK SUPPORT" when the fuel level is between 1/4 and 3/4 full, and vehicle is placed on flat level surface. Open engine hood before conducting the following procedures. F 1. Tighten fuel filler cap securely until ratcheting sound is heard. 2. Turn ignition switch ON. Turn ignition switch OFF and wait at least 10 seconds. Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-III. 5. Check that the following conditions are met. COOLAN TEMP/S: 0 - 70°C (32 - 158°F) INT/A TEMP SE: 0 - 60°C (32 - 140°F) Select "EVP SML LEAK P0442/P1442" of "EVAPORATIVE SYSTEM" in "DTC WORK SUPPORT" mode with CONSULT-III. Follow the instructions displayed. NOTE: If the engine speed cannot be maintained within the range displayed on the CONSULT-III screen, go to EC-20, "BASIC INSPECTION: Special Repair Requirement". Which is displayed on CONSULT-III screen? OK >> INSPECTION END NG >> GO TO 3. 3.CHECK DTC K Check DTC. Which DTC is detected? P0455 >> Go to EC-330, "Diagnosis Procedure". P0442 >> Go to EC-292, "Diagnosis Procedure". 4.PERFORM DTC CONFIRMATION PROCEDURE NOTE: Be sure to read the explanation of Driving Pattern in <u>EC-546</u>, "How to Set SRT Code" before driving vehicle. 1. Start engine. 2. Drive vehicle according to Driving Pattern. 3. Stop vehicle. Turn ignition switch OFF and wait at least 10 seconds. 5. Turn ignition switch ON 6. Turn ignition switch OFF and wait at least 10 seconds. Turn ignition switch ON. Р 8. Check 1st trip DTC. Is 1st trip DTC detected? YES-1 >> P0455: Go to EC-330, "Diagnosis Procedure". YES-2 >> P0442: Go to EC-292, "Diagnosis Procedure".

EC-329 Revision: 2009 March 2009 FX35/FX50

YES-3 >> P0441: Go to EC-288, "Diagnosis Procedure".

>> INSPECTION END

NO

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Diagnosis Procedure

INFOID:0000000003856204

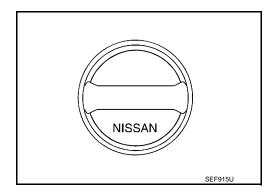
1. CHECK FUEL FILLER CAP DESIGN

- 1. Turn ignition switch OFF.
- 2. Check for genuine NISSAN fuel filler cap design.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace with genuine NISSAN fuel filler cap.



2. CHECK FUEL FILLER CAP INSTALLATION

Check that the cap is tightened properly by rotating the cap clockwise.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Open fuel filler cap, then clean cap and fuel filler neck threads using air blower. Retighten until ratcheting sound is heard.

3. CHECK FUEL FILLER CAP FUNCTION

Check for air releasing sound while opening the fuel filler cap.

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4. CHECK FUEL TANK VACUUM RELIEF VALVE

Refer to EC-332, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace fuel filler cap with a genuine one.

5. CHECK EVAP PURGE LINE

Check EVAP purge line (pipe, rubber tube, fuel tank and EVAP canister) for cracks, improper connection or disconnection.

Refer to EC-84, "System Diagram".

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or reconnect the hose.

6.CLEAN EVAP PURGE LINE

Clean EVAP purge line (pipe and rubber tube) using air blower.

>> GO TO 7.

7.CHECK EVAP CANISTER VENT CONTROL VALVE

Check the following.

- EVAP canister vent control valve is installed properly.
 Refer to <u>EC-570</u>, "<u>Removal and Installation</u>".
- EVAP canister vent control valve.

Refer to EC-307, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace EVAP canister vent control valve and O-ring.

Revision: 2009 March EC-330 2009 FX35/FX50

[VQ35HR] < DTC/CIRCUIT DIAGNOSIS > 8. CHECK FOR EVAP LEAK Refer to EC-568, "Inspection". Is there any leak in EVAP line? >> Repair or replace malfunctioning part. EC NO-1 >> With CONSULT-III: GO TO 9. NO-2 >> Without CONSULT-III: GO TO 10. 9.CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION (P)With CONSULT-III Disconnect vacuum hose connected to EVAP canister purge volume control solenoid valve at EVAP ser-D vice port. Start engine and let it idle. 3. Select "PURG VOL CONT/V" in "ACTIVE TEST" mode. 4. Touch "Qu" on CONSULT-III screen to increase "PURG VOL CONT/V" opening to 100%. Е Check vacuum hose for vacuum. Vacuum should exist. Is the inspection result normal? YES >> GO TO 12. NO >> GO TO 11. 10.CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION Without CONSULT-III Н 1. Start engine and warm it up to normal operating temperature. Stop engine. 3. Disconnect vacuum hose connected to EVAP canister purge volume control solenoid valve at EVAP service port. Start engine and let it idle for at least 80 seconds. 5. Check vacuum hose for vacuum when revving engine up to 2,000 rpm. Vacuum should exist. Is the inspection result normal? YES >> GO TO 13. NO >> GO TO 11. 11. CHECK VACUUM HOSE Check vacuum hoses for clogging or disconnection. Refer to EC-84, "System Diagram". Is the inspection result normal? YES-1 >> With CONSULT-III: GO TO 12. YES-2 >> Without CONSULT-III: GO TO 13. >> Repair or reconnect the hose. 12.CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE Ν (P)With CONSULT-III Start engine. Perform "PURG VOL CONT/V" in "ACTIVE TEST" mode with CONSULT-III. Check that engine speed varies according to the valve opening. Does engine speed vary according to the valve opening? YES >> GO TO 14. Р NO >> GO TO 13. 13. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE Refer to EC-300, "Component Inspection". Is the inspection result normal? YES >> GO TO 14.

Revision: 2009 March EC-331 2009 FX35/FX50

>> Replace EVAP canister purge volume control solenoid valve.

NO

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

14. CHECK FUEL TANK TEMPERATURE SENSOR

Refer to EC-247, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 15.

NO >> Replace "fuel level sensor unit and fuel pump".

15. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-315, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 16.

NO >> Replace EVAP control system pressure sensor.

16. CHECK EVAP/ORVR LINE

Check EVAP/ORVR line between EVAP canister and fuel tank for clogging, kinks, looseness and improper connection. For location, refer to EC-489, "Description".

Is the inspection result normal?

YES >> GO TO 17.

NO >> Repair or replace hoses and tubes.

17. CHECK RECIRCULATION LINE

Check recirculation line between filler neck tube and fuel tank for clogging, kinks, cracks, looseness and improper connection.

Is the inspection result normal?

YES >> GO TO 18.

NO >> Repair or replace hose, tube or filler neck tube.

18. CHECK REFUELING EVAP VAPOR CUT VALVE

Refer to EC-492, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 19.

NO >> Replace refueling EVAP vapor cut valve with fuel tank.

19. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident",

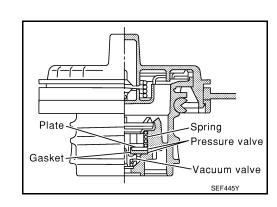
>> INSPECTION END

Component Inspection

INFOID:0000000003856205

1. CHECK FUEL FILLER CAP

- 1. Turn ignition switch OFF.
- 2. Remove fuel filler cap.
- 3. Wipe clean valve housing.



< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Install fuel filler cap adapter (commercial service tool) to fuel filler cap.

5. Check valve opening pressure and vacuum.

> Pressure: 15.3 - 20.0 kPa (0.156 - 0.204 kg/cm², 2.22 -

> > 2.90 psi)

Vacuum: -6.0 to -3.3 kPa (-0.061 to -0.034 kg/cm²,

-0.87 to -0.48 psi)

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.REPLACE FUEL FILLER CAP

Replace fuel filler cap.

CAUTION:

Use only a genuine fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the MIL may illuminate.

>> INSPECTION END

-Vacuum/Pressure gauge Vacuum/ Pressure -Fuel filler pump сар One-way valve Fuel filler cap adapter SEF943S

EC

Α

C

D

Е

F

Н

J

K

L

M

Ν

0

Р

DTC Logic

DTC DETECTION LOGIC

NOTE:

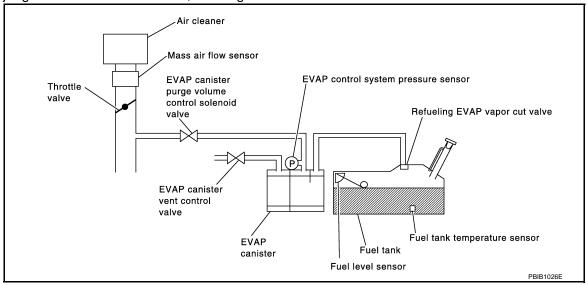
If DTC P0456 is displayed with DTC P0442, first perform the trouble diagnosis for DTC P0456.

This diagnosis detects very small leaks in the EVAP line between fuel tank and EVAP canister purge volume control solenoid valve, using the intake manifold vacuum in the same way as conventional EVAP small leak diagnosis.

If ECM judges a leak which corresponds to a very small leak, the very small leak P0456 will be detected.

If ECM judges a leak equivalent to a small leak, EVAP small leak P0442 will be detected.

If ECM judges that there are no leaks, the diagnosis will be OK.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0456	Evaporative emission control system very small leak (negative pressure check)	EVAP system has a very small leak. EVAP system does not operate properly.	 Incorrect fuel tank vacuum relief valve Incorrect fuel filler cap used Fuel filler cap remains open or does not close. Foreign matter caught in fuel filler cap. Leak is in line between intake manifold and EVAP canister purge volume control solenoid valve. Foreign matter caught in EVAP canister vent control valve. EVAP canister or fuel tank leaks EVAP purge line (pipe and rubber tube) leaks EVAP purge line rubber tube bent Loose or disconnected rubber tube EVAP canister vent control valve and the circuit EVAP canister purge volume control solenoid valve and the circuit Fuel tank temperature sensor O-ring of EVAP canister vent control valve is missing or damaged EVAP canister is saturated with water EVAP control system pressure sensor Refueling EVAP vapor cut valve ORVR system leaks Fuel level sensor and the circuit Foreign matter caught in EVAP canister purge volume control solenoid valve

CAUTION:

 Use only a genuine NISSAN fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the MIL may illuminate.

[VQ35HR] < DTC/CIRCUIT DIAGNOSIS >

- If the fuel filler cap is not tightened properly, the MIL may illuminate.
- Use only a genuine NISSAN rubber tube as a replacement.

DTC CONFIRMATION PROCEDURE

1. INSPECTION START

EC

Α

Will CONSULT-III be used? Will CONSULT-III be used?

YES >> GO TO 2.

NO >> GO TO 4.

2.preconditioning

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

NOTE:

After repair, check that the hoses and clips are installed properly.

TESTING CONDITION:

- Open engine hood before conducting the following procedure.
- If any of following conditions are met just before the DTC confirmation procedure, leave the vehicle for more than 1 hour.
- Fuel filler cap is removed.
- Fuel is refilled or drained.
- EVAP component part/parts is/are removed.
- Before performing the following procedure, confirm that battery voltage is more than 11 V at idle.
- Check that EVAP hoses are connected to EVAP canister purge volume control solenoid valve properly.

>> GO TO 3.

3.perform dtc confirmation procedure

(P)With CONSULT-III

- 1. Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-III.
- Check that the following conditions are met.

FUEL LEVEL SE: 0.25 - 1.4 V

COOLAN TEMP/S: 0 - 32°C (32 - 90°F) FUEL T/TMP SE: 0 - 35°C (32 - 95°F) INT A/TEMP SE: More than 0°C (32°F)

If NG, turn ignition switch OFF and leave the vehicle in a cool place (soak the vehicle), or refill/drain fuel until the output voltage condition of the "FUEL LEVEL SE" meets within the range above and leave the vehicle for more than 1 hour. Then start from step 1.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Select "EVP V/S LEAK P0456/P1456" of "EVAPORATIVE SYSTEM" in "DTC WORK SUPPORT" mode with CONSULT-III.

Follow the instructions displayed.

NOTE:

If the engine speed cannot be maintained within the range displayed on CONSULT-III screen, go to EC-20, "BASIC INSPECTION: Special Repair Requirement".

Which is displayed on CONSULT-III screen?

OK >> INSPECTION END

NG >> Go to EC-336, "Diagnosis Procedure".

4.PERFORM COMPONENT FUNCTION CHECK

Perform component function check. Refer to EC-336, "Component Function Check".

NOTE:

EC-335 Revision: 2009 March 2009 FX35/FX50

D

Е

F

Н

Р

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Use component function check to check the overall function of the EVAP very small leak function. During this check, a 1st trip DTC might not be confirmed.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-336, "Diagnosis Procedure".

Component Function Check

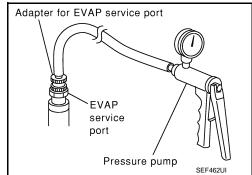
INFOID:0000000003856207

1. PERFORM COMPONENT FUNCTION CHECK

With GST

- Never use compressed air, doing so may damage the EVAP system.
- Never start engine.
- Never exceed 4.12 kPa (0.042 kg/cm², 0.6 psi).
- 1. Attach the EVAP service port adapter securely to the EVAP service port (commercial service tool).
- 2. Set the pressure pump and a hose.
- 3. Also set a vacuum gauge via 3-way connector and a hose.
- 4. Turn ignition switch ON.
- 5. Connect GST and select Service \$08.
- 6. Using Service \$08 control the EVAP canister vent control valve (close).
- 7. Apply pressure and check the following conditions are satisfied.

Pressure to be applied: 2.7 kPa (0.028 kg/cm², 0.39 psi) Time to be waited after the pressure drawn in to the EVAP system and the pressure to be dropped: 60 seconds and the pressure should not be dropped more than 0.4 kPa (0.004 kg/cm², 0.06 psi).



Is the inspection result normal?

YES >> GO TO 2.

NO >> Go to EC-336, "Diagnosis Procedure".

2. RELEASE PRESSURE

- Disconnect GST.
- 2. Start engine and warm it up to normal operating temperature.
- 3. Turn ignition switch OFF and wait at least 10 seconds.
- 4. Turn ignition switch ON.
- 5. Turn ignition switch OFF and wait at least 10 seconds.
- 6. Restart engine and let it idle for 90 seconds.
- 7. Keep engine speed at 2,000 rpm for 30 seconds.
- 8. Turn ignition switch OFF.

NOTE

For more information, refer to GST Instruction Manual.

>> INSPECTION END

Diagnosis Procedure

INFOID:0000000003856208

1. CHECK FUEL FILLER CAP DESIGN

1. Turn ignition switch OFF.

< DTC/CIRCUIT DIAGNOSIS >

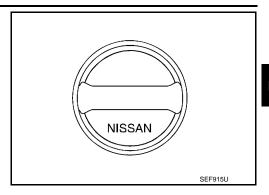
[VQ35HR]

Check for genuine NISSAN fuel filler cap design.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace with genuine NISSAN fuel filler cap.



2. CHECK FUEL FILLER CAP INSTALLATION

Check that the cap is tightened properly by rotating the cap clockwise.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Open fuel filler cap, then clean cap and fuel filler neck threads using air blower. Retighten until ratcheting sound is heard.

3.CHECK FUEL FILLER CAP FUNCTION

Check for air releasing sound while opening the fuel filler cap.

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4. CHECK FUEL TANK VACUUM RELIEF VALVE

Refer to EC-340, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace fuel filler cap with a genuine one.

5.CHECK FOR EVAP LEAK

Refer to EC-568, "Inspection".

Is there any leak in EVAP line?

YES >> Repair or replace malfunctioning part.

NO >> GO TO 6.

6.CHECK EVAP CANISTER VENT CONTROL VALVE

Check the following.

• EVAP canister vent control valve is installed properly.

Refer to EC-570, "Removal and Installation".

EVAP canister vent control valve.

Refer to EC-307, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace EVAP canister vent control valve and O-ring.

7.CHECK IF EVAP CANISTER IS SATURATED WITH WATER

 Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.

EC

Α

D

Е

F

Н

J

K

N

N

1 1

0

Ρ

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

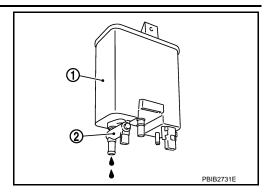
- 2. Check if water will drain from EVAP canister (1).
 - 2 : EVAP canister vent control valve

Does water drain from the EVAP canister?

YES >> GO TO 8.

NO-1 >> With CONSULT-III: GO TO 10.

NO-2 >> Without CONSULT-III: GO TO 11.



8. CHECK EVAP CANISTER

Weigh the EVAP canister with the EVAP canister vent control valve and EVAP control system pressure sensor attached.

The weight should be less than 2.1 kg (4.6 lb).

Is the inspection result normal?

YES-1 >> With CONSULT-III: GO TO 10.

YES-2 >> Without CONSULT-III: GO TO 11.

NO >> GO TO 9.

9. DETECT MALFUNCTIONING PART

Check the following.

- EVAP canister for damage
- EVAP hose between EVAP canister and vehicle frame for clogging or poor connection
 - >> Repair hose or replace EVAP canister.

10.CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

(P)With CONSULT-III

- Disconnect vacuum hose connected to EVAP service port and EVAP canister purge volume control solenoid valve from EVAP canister purge volume control solenoid valve.
- Start engine and let it idle.
- 3. Select "PURG VOL CONT/V" in "ACTIVE TEST" mode.
- 4. Touch "Qu" on CONSULT-III screen to increase "PURG VOL CONT/V" opening to 100%.
- Check vacuum hose for vacuum.

Vacuum should exist.

Is the inspection result normal?

YES >> GO TO 13.

NO >> GO TO 12.

11.CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

⋈Without CONSULT-III

- 1. Start engine and warm it up to normal operating temperature.
- Stop engine.
- Disconnect vacuum hose connected to EVAP service port and EVAP canister purge volume control solenoid valve from EVAP canister purge volume control solenoid valve.
- 4. Start engine and let it idle for at least 80 seconds.
- 5. Check vacuum hose for vacuum when revving engine up to 2,000 rpm.

Vacuum should exist.

Is the inspection result normal?

YES >> GO TO 14.

NO >> GO TO 12.

12. CHECK VACUUM HOSE

Check vacuum hoses for clogging or disconnection. Refer to EC-84, "System Diagram".

< DTC/CIRCUIT DIAGNOSIS >	[VQ35HR]
Is the inspection result normal?	
YES >> GO TO 13.	
NO >> Repair or reconnect the hose.	
13. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE	
Refer to EC-300, "Component Inspection".	
Is the inspection result normal?	
YES >> GO TO 14.	
NO >> Replace EVAP canister purge volume control solenoid valve.	
14.CHECK FUEL TANK TEMPERATURE SENSOR	
Refer to EC-247, "Component Inspection".	
Is the inspection result normal?	
YES >> GO TO 15. NO >> Replace "fuel level sensor unit and fuel pump".	
15. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR	
Refer to <u>EC-315</u> . "Component Inspection". Is the inspection result normal?	
YES >> GO TO 16.	
NO >> Replace EVAP control system pressure sensor.	
16. CHECK EVAP PURGE LINE	
Check EVAP purge line (pipe, rubber tube, fuel tank and EVAP canister) for cracks or improp	er connection
Refer to <u>EC-84, "System Diagram"</u> .	or commodition.
Is the inspection result normal?	
YES >> GO TO 17.	
NO >> Repair or reconnect the hose.	
17.CLEAN EVAP PURGE LINE	
Clean EVAP purge line (pipe and rubber tube) using air blower.	
>> GO TO 18.	
18. CHECK EVAP/ORVR LINE	
Check EVAP/ORVR line between EVAP canister and fuel tank for clogging, kinks, loosene	ess and improper
connection. For location, refer to EC-489, "Description".	, ,,
Is the inspection result normal?	
YES >> GO TO 19.	
NO >> Repair or replace hoses and tubes.	
19.check recirculation line	
Check recirculation line between filler neck tube and fuel tank for clogging, kinks, cracks improper connection.	s, looseness and
Is the inspection result normal?	
YES >> GO TO 20.	
NO >> Repair or replace hose, tube or filler neck tube.	
20.check refueling evap vapor cut valve	
Refer to EC-492, "Component Inspection".	
Is the inspection result normal?	
YES >> GO TO 21.	
NO >> Replace refueling EVAP vapor cut valve with fuel tank.	
21. CHECK FUEL LEVEL SENSOR	
Refer to MWI-63, "Component Inspection".	

Revision: 2009 March **EC-339** 2009 FX35/FX50

Is the inspection result normal?

< DTC/CIRCUIT DIAGNOSIS >

YES >> GO TO 22.

NO >> Replace "fuel level sensor unit and fuel pump (main)".

22. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

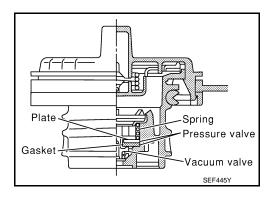
>> INSPECTION END

Component Inspection

INFOID:0000000003856209

1. CHECK FUEL FILLER CAP

- Turn ignition switch OFF.
- Remove fuel filler cap.
- Wipe clean valve housing.



- Install fuel filler cap adapter (commercial service tool) to fuel filler cap.
- Check valve opening pressure and vacuum.

Pressure: 15.3 - 20.0 kPa (0.156 - 0.204 kg/cm², 2.22 -

2.90 psi)

Vacuum: -6.0 to -3.3 kPa (-0.061 to -0.034 kg/cm²,

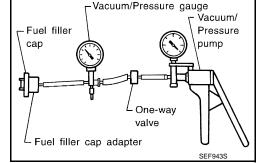
-0.87 to -0.48 psi)

Is the inspection result normal?

NO >> GO TO 2.

YES >> INSPECTION END

2. REPLACE FUEL FILLER CAP



Replace fuel filler cap.

CAUTION:

Use only a genuine fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the MIL may illuminate.

>> INSPECTION END

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Α

EC

D

Е

M

N

C

INFOID:0000000003856212

P0460 FUEL LEVEL SENSOR

Description INFOID:0000000003856210

The fuel level sensor is mounted in the fuel level sensor unit.

The sensor detects a fuel level in the fuel tank and transmits a signal to the "unified meter and A/C amp.". The "unified meter and A/C amp." sends the fuel level sensor signal to the ECM through the CAN communication line

It consists of two parts, one is mechanical float and the other is variable resistor. Fuel level sensor output voltage changes depending on the movement of the fuel mechanical float.

DTC Logic

DTC DETECTION LOGIC

NOTE:

- If DTC P0460 is displayed with DTC UXXXX, first perform the trouble diagnosis for DTC UXXXX.
- If DTC P0460 is displayed with DTC P0607, first perform the trouble diagnosis for DTC P0607. Refer to <u>EC-360</u>, "DTC Logic".

When the vehicle is parked, the fuel level in the fuel tank is naturally stable. It means that output signal of the fuel level sensor does not change. If ECM senses sloshing signal from the sensor, fuel level sensor malfunction is detected.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0460	Fuel level sensor circuit noise	Even though the vehicle is parked, a signal being varied is sent from the fuel level sensor to ECM.	 Harness or connectors (The CAN communication line is open or shorted) Harness or connectors (The sensor circuit is open or shorted) Unified meter and A/C amp. Fuel level sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine and wait maximum of 2 consecutive minutes.
- 2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-341, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1. CHECK DTC WITH "UNIFIED METER AND A/C AMP."

Refer to MWI-45, "CONSULT-III Function (METER/M&A)".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Go to MWI-62, "Diagnosis Procedure".

2. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

Revision: 2009 March **EC-341** 2009 FX35/FX50

>> INSPECTION END

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

P0461 FUEL LEVEL SENSOR

Description INFOID:0000000003856213

The fuel level sensor is mounted in the fuel level sensor unit.

The sensor detects a fuel level in the fuel tank and transmits a signal to the "unified meter and A/C amp.". The "unified meter and A/C amp." sends the fuel level sensor signal to the ECM through CAN communication line. It consists of two parts, one is mechanical float and the other is variable resistor. Fuel level sensor output voltage changes depending on the movement of the fuel mechanical float.

DTC Logic INFOID:0000000003856214

DTC DETECTION LOGIC

NOTE:

- If DTC P0461 is displayed with DTC UXXXX, first perform the trouble diagnosis for DTC UXXXX.
- If DTC P0461 is displayed with DTC P0607, first perform the trouble diagnosis for DTC P0607. Refer to EC-360, "DTC Logic".

Driving long distances naturally affect fuel gauge level.

This diagnosis detects the fuel gauge malfunction of the gauge not moving even after a long distance has been driven.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	G
P0461	Fuel level sensor circuit range/performance	The output signal of the fuel level sensor does not change within the specified range even though the vehicle has been driven a long distance.	Harness or connectors (The CAN communication line is open or shorted) Harness or connectors (The sensor circuit is open or shorted) Unified meter and A/C amp. Fuel level sensor	Н

DTC CONFIRMATION PROCEDURE

1. PERFORM COMPONENT FUNCTION CHECK

Perform component function check. Refer to EC-343, "Component Function Check".

Use component function check to check the overall function of the fuel level sensor. During this check, a 1st trip DTC might not be confirmed.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-344, "Diagnosis Procedure".

Component Function Check

1.PRECONDITIONING

WARNING:

When performing the following procedure, always observe the handling of the fuel. Refer to FL-10, "Removal and Installation".

TESTING CONDITION:

Before starting component function check, preparation of draining fuel and refilling fuel is required.

Will CONSULT-III be used?

YES >> GO TO 2.

NO >> GO TO 3.

2.PERFORM COMPONENT FUNCTION CHECK

With CONSULT-III

NOTE:

Start from step 10, if it is possible to confirm that the fuel cannot be drained by 30 ℓ (7-7/8 US gal, 6-5/ 8 Imp gal) in advance.

Prepare a fuel container and a spare hose.

EC-343 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

L

M

INFOID:0000000003856215

Ν

Р

P0461 FUEL LEVEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

- Release fuel pressure from fuel line, refer to <u>EC-567</u>, "Inspection".
- 3. Remove the fuel feed hose on the fuel level sensor unit.
- 4. Connect a spare fuel hose where the fuel feed hose was removed.
- 5. Turn ignition switch OFF and wait at least 10 seconds then turn ON.
- 6. Select "FUEL LEVEL SE" in "DATA MONITOR" mode with CONSULT-III.
- 7. Check "FUEL LEVEL SE" output voltage and note it.
- 8. Select "FUEL PUMP RELAY" in "ACTIVE TEST" mode with CONSULT-III.
- 9. Touch "ON" and drain fuel approximately 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal) and stop it.
- 10. Check "FUEL LEVEL SE" output voltage and note it.
- 11. Fill fuel into the fuel tank for 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal).
- 12. Check "FUEL LEVEL SE" output voltage and note it.
- 13. Confirm whether the voltage changes more than 0.03 V during step 7 to 10 and 10 to 12.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-344, "Diagnosis Procedure".

3.perform component function check

Without CONSULT-III

NOTE:

Start from step 8, if it is possible to confirm that the fuel cannot be drained by 30 $\,\ell$ (7-7/8 US gal, 6-5/8 Imp gal) in advance.

- 1. Prepare a fuel container and a spare hose.
- Release fuel pressure from fuel line. Refer to <u>EC-567</u>, "Inspection".
- 3. Remove the fuel feed hose on the fuel level sensor unit.
- 4. Connect a spare fuel hose where the fuel feed hose was removed.
- 5. Turn ignition switch ON.
- 6. Drain fuel by 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal) from the fuel tank using proper equipment.
- 7. Confirm that the fuel gauge indication varies.
- 8. Fill fuel into the fuel tank for 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal).
- 9. Confirm that the fuel gauge indication varies.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-344, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003856216

${f 1.}$ CHECK DTC WITH "UNIFIED METER AND A/C AMP."

Refer to MWI-45, "CONSULT-III Function (METER/M&A)".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Go to MWI-62, "Diagnosis Procedure".

2. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

P0462, P0463 FUEL LEVEL SENSOR

Description INFOID:0000000003856217

The fuel level sensor is mounted in the fuel level sensor unit.

The sensor detects a fuel level in the fuel tank and transmits a signal to the "unified meter and A/C amp.". The "unified meter and A/C amp." sends the fuel level sensor signal to the ECM through CAN communication line. It consists of two parts, one is mechanical float and the other is variable resistor. Fuel level sensor output voltage changes depending on the movement of the fuel mechanical float.

DTC Logic INFOID:0000000003856218

DTC DETECTION LOGIC

NOTE:

- If DTC P0462 or P0463 is displayed with DTC UXXXX, first perform the trouble diagnosis for DTC UXXXX.
- If DTC P0462 or P0463 is displayed with DTC P0607, first perform the trouble diagnosis for DTC P0607.Refer to EC-360, "DTC Logic".

This diagnosis indicates the former, to detect open or short circuit malfunction.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0462	Fuel level sensor circuit low input	An excessively low voltage from the sensor is sent to ECM.	Harness or connectors (The CAN communication line is open or
P0463	Fuel level sensor circuit high input	An excessively high voltage from the sensor is sent to ECM.	shorted) • Harness or connectors (The sensor circuit is open or shorted) • Unified meter and A/C amp. • Fuel level sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 11 V at ignition switch ON.

>> GO TO 2.

2 .PERFORM DTC CONFIRMATION PROCEDURE

- Turn ignition switch ON and wait at least 5 seconds.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-345, "Diagnosis Procedure".

>> INSPECTION END NO

Diagnosis Procedure

 ${f 1}$.CHECK DTC WITH "UNIFIED METER AND A/C AMP."

Refer to MWI-45, "CONSULT-III Function (METER/M&A)".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Go to MWI-62, "Diagnosis Procedure".

2.CHECK INTERMITTENT INCIDENT

EC-345 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

F

K

M

N

Р

INFOID:0000000003856219

P0462, P0463 FUEL LEVEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

P0500 VSS

Description INFOID:0000000003856220

The vehicle speed signal is sent to the "unified meter and A/C amp." from the "ABS actuator and electric unit (control unit)" by CAN communication line. The "unified meter and A/C amp." then sends a signal to the ECM by CAN communication line.

EC

Α

DTC Logic

INFOID:0000000003856221

DTC DETECTION LOGIC

If DTC P0500 is displayed with DTC UXXXX, first perform the trouble diagnosis for DTC UXXXX.

 If DTC P0500 is displayed with DTC P0607, first perform the trouble diagnosis for DTC P0607. Refer to EC-360, "DTC Logic".

Е

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0500	Vehicle speed sensor	The vehicle speed signal sent to ECM is almost 0 km/h (0 MPH) even when vehicle is being driven.	Harness or connectors (The CAN communication line is open or shorted) Harness or connectors (The vehicle speed signal circuit is open or shorted) Wheel sensor Unified meter and A/C amp. ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.INSPECTION START

Will CONSULT-III be used?

Will CONSULT-III be used?

YES >> GO TO 2.

NO >> GO TO 5.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 3.

3.CHECK VEHICLE SPEED SIGNAL

NOTE:

This procedure may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

(P)With CONSULT-III

Start engine (VDC switch OFF).

Read "VHCL SPEED SE" in "DATA MONITOR" mode with CONSULT-III. The vehicle speed on CON-SULT-III should exceed 10 km/h (6 MPH) when rotating wheels with suitable gear position.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Go to EC-348, "Diagnosis Procedure".

4. PERFORM DTC CONFIRMATION PROCEDURE

- Select "DATA MONITOR" mode with CONSULT-III.
- Warm engine up to normal operating temperature.

EC-347 Revision: 2009 March 2009 FX35/FX50

D

F

Н

Ν

Р

3. Maintain the following conditions for at least 50 consecutive seconds.

CAUTION:

Always drive vehicle at a safe speed.

ENG SPEED	1,650 - 6,000 rpm
COOLAN TEMP/S	More than 70°C (158°F)
B/FUEL SCHDL	6.5 - 31.8 msec
Selector lever	Except P or N position
PW/ST SIGNAL	OFF

4. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-348, "Diagnosis Procedure".

NO >> INSPECTION END

5. PERFORM COMPONENT FUNCTION CHECK

∰With GST

Perform component function check. Refer to EC-348, "Component Function Check".

Use component function check to check the overall function of the vehicle speed signal circuit. During this check, a 1st trip DTC might not be confirmed.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-348, "Diagnosis Procedure".

Component Function Check

INFOID:0000000003856222

1. PERFORM COMPONENT FUNCTION CHECK

■With GST

- 1. Lift up drive wheels.
- 2. Start engine.
- Read vehicle speed signal in Service \$01 with GST.

The vehicle speed signal on GST should be able to exceed 10 km/h (6 MPH) when rotating wheels with suitable gear position.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-348, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003856223

1. CHECK DTC WITH "ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)"

Refer to BRC-44, "CONSULT-III Function".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace malfunctioning part.

2.CHECK DTC WITH "UNIFIED METER AND A/C AMP."

Refer to MWI-45, "CONSULT-III Function (METER/M&A)".

>> INSPECTION END

P0506 ISC SYSTEM

Description INFOID:0000000008856224

The ECM controls the engine idle speed to a specified level through the fine adjustment of the air, which is let into the intake manifold, by operating the electric throttle control actuator. The operating of the throttle valve is varied to allow for optimum control of the engine idling speed. The crankshaft position sensor detects the actual engine speed and sends a signal to the ECM.

The ECM controls the electric throttle control actuator so that the engine speed coincides with the target value memorized in the ECM. The target engine speed is the lowest speed at which the engine can operate steadily. The optimum value stored in the ECM is determined by taking into consideration various engine conditions, such as during warming up, deceleration and engine load (air conditioner, power steering and cooling fan operation, etc.).

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P0506 is displayed with other DTC, first perform the trouble diagnosis for the other DTC.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0506	Idle speed control sys- tem RPM lower than ex- pected	The idle speed is less than the target idle speed by 100 rpm or more.	Electric throttle control actuator Intake air leak

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

If the target idle speed is out of the specified value, perform <u>EC-25, "IDLE AIR VOLUME LEARNING: Special Repair Requirement"</u>, before conducting DTC Confirmation Procedure.

TESTING CONDITION:

- Before performing the following procedure, confirm that battery voltage is more than 11 V at idle.
- Always perform the test at a temperature above –10°C(14°F).

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine and warm it up to normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Turn ignition switch ON.
- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Restart engine and run it for at least 1 minute at idle speed.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-349, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1. CHECK INTAKE AIR LEAK

- Start engine and let it idle.
- Listen for an intake air leak after the mass air flow sensor.

Is intake air leak detected?

Е

Α

EC

K

N

IVI

Ν

1.4

 \circ

INFOID:0000000003856226

P0506 ISC SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

YES >> Discover air leak location and repair.

NO >> GO TO 2.

2.REPLACE ECM

- 1. Stop engine.
- 2. Replace ECM.
- 3. Go to EC-23, "ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT : Special Repair Requirement".

>> INSPECTION END

Α

EC

Е

P0507 ISC SYSTEM

Description INFOID:0000000003856227

The ECM controls the engine idle speed to a specified level through the fine adjustment of the air, which is let into the intake manifold, by operating the electric throttle control actuator. The operating of the throttle valve is varied to allow for optimum control of the engine idling speed. The crankshaft position sensor detects the actual engine speed and sends a signal to the ECM.

The ECM controls the electric throttle control actuator so that the engine speed coincides with the target value memorized in the ECM. The target engine speed is the lowest speed at which the engine can operate steadily. The optimum value stored in the ECM is determined by taking into consideration various engine conditions, such as during warming up, deceleration and engine load (air conditioner, power steering and cooling fan operation, etc.).

DTC Logic INFOID:0000000003856228

DTC DETECTION LOGIC

NOTE:

If DTC P0507 is displayed with other DTC, first perform the trouble diagnosis for the other DTC.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0507	Idle speed control sys- tem RPM higher than expected	The idle speed is more than the target idle speed by 200 rpm or more.	Electric throttle control actuator Intake air leak PCV system

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

If the target idle speed is out of the specified value, perform EC-25, "IDLE AIR VOLUME LEARNING: Special Repair Requirement", before conducting DTC Confirmation Procedure.

TESTING CONDITION:

- Before performing the following procedure, confirm that battery voltage is more than 11 V at idle.
- Always perform the test at a temperature above –10°C(14°F).

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- Start engine and warm it up to normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.
- Start engine and run it for at least 1 minute at idle speed.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-351, "Diagnosis Procedure".

>> INSPECTION END NO

Diagnosis Procedure

Confirm that PCV hose is connected correctly.

1. CHECK PCV HOSE CONNECTION

Is the inspection result normal?

YES >> GO TO 2.

INFOID:0000000003856229

K

N

P0507 ISC SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

NO >> Repair or replace malfunctioning part.

2. CHECK INTAKE AIR LEAK

- 1. Start engine and let it idle.
- 2. Listen for an intake air leak after the mass air flow sensor.

Is intake air leak detected?

YES >> Discover air leak location and repair.

NO >> GO TO 3.

3. REPLACE ECM

- 1. Stop engine.
- 2. Replace ECM.
- 3. Go to EC-23, "ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT : Special Repair Requirement".

>> INSPECTION END

Revision: 2009 March EC-352 2009 FX35/FX50

P0550 PSP SENSOR

Description INFOID:0000000003856230

Power steering pressure (PSP) sensor is installed to the power steering high-pressure tube and detects a power steering load.

This sensor is a potentiometer which transforms the power steering load into output voltage, and emits the voltage signal to the ECM. The ECM controls the electric throttle control actuator and adjusts the throttle valve opening angle to increase the engine speed and adjusts the idle speed for the increased load.

DTC Logic INFOID:0000000003856231

DTC DETECTION LOGIC

NOTE:

If DTC P0550 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. Refer to EC-361, "DTC Logic".

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0550	Power steering pressure sensor circuit	An excessively low or high voltage from the sensor is sent to ECM.	Harness or connectors (The sensor circuit is open or shorted) Power steering pressure sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- Start engine and let it idle for at least 5 seconds.
- 2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-353, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1. CHECK GROUND CONNECTION

- Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK POWER STEERING PRESSURE (PSP) SENSOR POWER SUPPLY CIRCUIT

- Disconnect PSP sensor harness connector.
- Turn ignition switch ON. 2.
- Check the voltage between PSP sensor harness connector and ground.

PSP s	sensor	Ground	Voltage (V)	
Connector Terminal		Ground	voltage (v)	
F35	3	Ground	Approx. 5	

EC-353 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

M

N

INFOID:0000000003856232

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

3.check PSP sensor ground circuit for open and short

- Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check the continuity between PSP sensor harness connector and ECM harness connector.

PSP sensor		EC	Continuity	
Connector	Terminal	Connector	Terminal	Continuity
F35	1	F102	96	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit, short to ground short to power in harness or connectors.

4. CHECK PSP SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between PSP sensor harness connector and ECM harness connector.

PSP sensor		EC	Continuity	
Connector	Terminal	Connector Terminal		Continuity
F35	2	F102	87	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

5. CHECK PSP SENSOR

Refer to EC-354, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace PSP sensor.

6. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000003856233

1. CHECK POWER STEERING PRESSURE SENSOR

- 1. Turn ignition switch OFF.
- 2. Reconnect all harness connectors disconnected.
- 3. Start engine and let it idle.
- 4. Check the voltage between ECM harness connector terminals under the following conditions.

	ECM					
Connector	+	_	Condition		Voltage (V)	
Connector	Terminal	Terminal				
F102	87	96	Steering wheel	Being turned	0.5 - 4.5	
1 102	07	90	Steering wheel	Not being turned	0.4 - 0.8	

Is the inspection result normal?

P0550 PSP SENSOR

< DTC/CIRCUIT DIAGNOSIS > [VQ35HR]

YES >> INSPECTION END

NO >> Replace power steering pressure sensor.

Α

EC

С

D

Е

F

G

Н

1

J

Κ

L

M

Ν

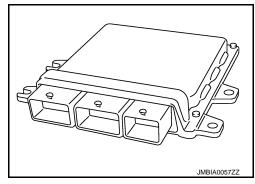
0

Ρ

P0603 ECM POWER SUPPLY

Description INFOID:000000003856234

Battery voltage is supplied to the ECM even when the ignition switch is turned OFF for the ECM memory function of the DTC memory, the air-fuel ratio feedback compensation value memory, the idle air volume learning value memory, etc.



DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0603	ECM power supply circuit	ECM back up RAM system does not function properly.	Harness or connectors [ECM power supply (back up) circuit is open or shorted.] ECM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.perform dtc confirmation procedure

- 1. Turn ignition switch ON and wait at least 1 second.
- 2. Start engine and let it idle for 1 second.
- 3. Turn ignition switch OFF, wait at least 10 seconds, and then turn it ON.
- 4. Repeat steps 2 and 3 for 4 times.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-356, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003856236

1. CHECK ECM POWER SUPPLY

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check the voltage between ECM harness connector terminals under the following conditions.

P0603 ECM POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

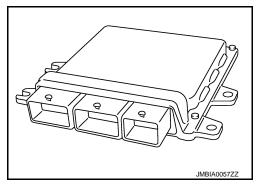
	ECM				А	
-	+	-	_	Voltage	-	
Connector	Terminal	Connector	Terminal			EC
F102	93	M107	128	Battery voltage		
Is the inspe						
	GO TO 3. GO TO 2.					С
2.DETECT		CTIONING	PART			
Check the f						D
 Harness 	connectors	E3, F1				
15 A fuseIPDM E/F		onnector F	7			Е
Harness f				nd battery		
_	-	replace har		nectors.		F
3. CHECK						
Refer to GI			ent".			G
Is the inspe	Ction result					
		replace har	ness or cor	nectors.		Н
4.PERFOR	RM DTC C	ONFIRMAT	ION PROC	EDURE		
	nition switc	h ON.				
 Erase I Perform 		firmation Pr	ocedure			ı
	C-356, "DTO		ocedure.			
Is the 1st tr	-	603 displaye	ed again?			J
	GO TO 5. INSPECT	ION END				
5.REPLAC		ION END				K
	e ECM. <u>EC-23, "AD</u>	DITIONAL	SERVICE '	WHEN REPLAC	SING CONTROL UNIT: Special Repair Require-	ı
ment".						_
	INSPECT	ION END				
>>	INSPECT	ION END				M
						Ν
						0
						Р

Revision: 2009 March **EC-357** 2009 FX35/FX50

P0605 ECM

Description INFOID:000000003856237

The ECM consists of a microcomputer and connectors for signal input and output and for power supply. The ECM controls the engine.



DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition		Possible cause
		A)	ECM calculation function is malfunctioning.	
P0605	Engine control module	B)	ECM EEP-ROM system is malfunctioning.	• ECM
		C)	ECM self shut-off function is malfunctioning.	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION A

- 1. Turn ignition switch ON.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-359, "Diagnosis Procedure".

NO >> GO TO 3.

3.perform dtc confirmation procedure for malfunction b

- 1. Turn ignition switch ON and wait at least 1 second.
- 2. Turn ignition switch OFF, wait at least 10 seconds, and then turn it ON.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-359, "Diagnosis Procedure".

NO >> GO TO 4.

4. PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION C

- 1. Turn ignition switch ON and wait at least 1 second.
- 2. Turn ignition switch OFF, wait at least 10 seconds, and then turn it ON.
- Repeat step 2 for 32 times.
- Check 1st trip DTC.

Is 1st trip DTC detected?

P0605 ECM

[VQ35HR] < DTC/CIRCUIT DIAGNOSIS > YES >> Go to EC-359, "Diagnosis Procedure". NO >> INSPECTION END Α Diagnosis Procedure INFOID:0000000003856239 1. INSPECTION START EC Turn ignition switch ON. Erase DTC. C 3. Perform DTC Confirmation Procedure. See EC-358, "DTC Logic". Is the 1st trip DTC P0605 displayed again? D YES >> GO TO 2. NO >> INSPECTION END 2.REPLACE ECM Е 1. Replace ECM. 2. Go to EC-23, "ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT: Special Repair Requirement". F >> INSPECTION END Н K L M Ν 0 Р

Revision: 2009 March EC-359 2009 FX35/FX50

P0607 ECM

Description INFOID:000000003856240

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0607	CAN communication bus	When detecting error during the initial diagnosis of CAN controller of ECM.	• ECM

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

- 1. Turn ignition switch ON.
- Check DTC.

Is DTC detected?

YES >> Go to EC-360, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003856242

1. INSPECTION START

- 1. Turn ignition switch ON.
- 2. Erase DTC.
- 3. Perform DTC Confirmation Procedure.

See EC-360, "DTC Logic".

4. Check DTC.

Is the DTC P0607 displayed again?

YES >> GO TO 2.

NO >> INSPECTION END

2.REPLACE ECM

- 1. Replace ECM.
- 2. Go to EC-23, "ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT: Special Repair Requirement".
 - >> INSPECTION END

P0643 SENSOR POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

P0643 SENSOR POWER SUPPLY

DTC Logic

DTC DETECTION LOGIC

EC

D

Е

F

Α

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0643	Sensor power supply circuit short	ECM detects that the voltage of power source for sensor is excessively low or high.	Harness or connectors [Accelerator pedal position (APP) sensor 1 circuit is shorted.] [Throttle position (TP) sensor circuit is shorted.] [Camshaft position (CMP) sensor (bank 1) circuit is shorted.] [Exhaust valve timing (EVT) control position sensor (bank 1) circuit is shorted.] [Power steering pressure (PSP) sensor circuit is shorted.] APP sensor TP sensor CMP sensor (bank 1) EVT control position sensor (bank 1) PSP sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

Н

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON
- 3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10 V at idle.

>> GO TO 2.

K

M

Ν

Р

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine and let it idle for 1 second.
- 2. Check DTC.

Is DTC detected?

YES >> Go to EC-361, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003856244

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- 2. Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2. CHECK ACCELERATOR PEDAL POSITION (APP) SENSOR 1 POWER SUPPLY CIRCUIT

- 1. Disconnect APP sensor harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between APP sensor harness connector and ground.

Revision: 2009 March **EC-361** 2009 FX35/FX50

APP se	ensor	0	Voltage (V)	
Connector	Terminal	Ground		
E112 (Without ICC)	5	Ground	Approx. 5	
E116 (With ICC)	3		Арргох. 5	

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 3.

3.CHECK SENSOR POWER SUPPLY CIRCUITS

Check harness for short to power and short to ground, between the following terminals.

ECM		Sensor				
Connector	Terminal	Name	Connector	Terminal		
F101	43	Electric throttle control actuator (bank 2)	F27	1		
FIUI	44	Electric throttle control actuator (bank 1)	F6	6		
		Camshaft position (CMP) sensor (bank 1)	F5	1		
F102	60	Exhaust valve timing (EVT) control position sensor (bank 1)	F4	1		
		Power steering pressure (PSP) sensor	F35	3		
M107	99	APP sensor	E112 (Without ICC)	5		
WHO7	99	AFF SEIISUI		E116 (With ICC)	5	

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair short to ground or short to power in harness or connectors.

4. CHECK COMPONENTS

Check the following.

- CMP sensor (bank 1) (Refer to <u>EC-279</u>, "Component Inspection".)
- EVT control position sensor (bank 1) (Refer to EC-371, "Component Inspection".)
- PSP sensor (Refer to EC-354, "Component Inspection".)

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace malfunctioning component.

${f 5.}$ CHECK THROTTLE POSITION (TP) SENSOR

Refer to EC-193, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 9.

>> GO TO 6. NO

6. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

- Replace electric throttle control actuator.
- Go to EC-193, "Special Repair Requirement".

>> INSPECTION END

7. CHECK APP SENSOR

Refer to EC-446. "Component Inspection".

P0643 SENSOR POWER SUPPLY

P0643 SENSOR POWER SUPPLY		
< DTC/CIRCUIT DIAGNOSIS >	[VQ35HR]	
Is the inspection result normal?		
YES >> GO TO 9. NO >> GO TO 8.		Α
8. REPLACE ACCELERATOR PEDAL ASSEMBLY	i	
		EC
 Replace accelerator pedal assembly. Go to <u>EC-447</u>, "Special Repair Requirement". 	•	
		С
>> INSPECTION END		
9.CHECK INTERMITTENT INCIDENT		D
Refer to GI-35, "Intermittent Incident".		D
>> INSPECTION END		
The man de m		Е
		F
		G
		Н
		11
		I
		J
		K
		L
		_
		M
		Ν
		0
		Р
		Γ

Revision: 2009 March **EC-363** 2009 FX35/FX50

[VQ35HR]

P0850 PNP SWITCH

Description INFOID:000000003856245

When the selector lever position is P or N, park/neutral position (PNP) signal from the TCM is sent to ECM.

DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	
P0850	Park/neutral position switch	The signal of the park/neutral position (PNP) signal does not change during driving after the engine is started.	Harness or connectors (The PNP signal circuit is open or shorted.) TCM	

DTC CONFIRMATION PROCEDURE

1.INSPECTION START

Will CONSULT-III be used?

Will CONSULT-III be used?

YES >> GO TO 2.

NO >> GO TO 5.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 3.

3. CHECK PNP SIGNAL

With CONSULT-III

- 1. Turn ignition switch ON.
- 2. Select "P/N POSI SW" in "DATA MONITOR" mode with CONSULT-III. Then check the "P/N POSI SW" signal under the following conditions.

Position (Selector lever)	Known-good signal
N or P position	ON
Except above position	OFF

Is the inspection result normal?

YES >> GO TO 4.

NO >> Go to EC-365, "Diagnosis Procedure".

f 4.PERFORM DTC CONFIRMATION PROCEDURE

- 1. Select "DATA MONITOR" mode with CONSULT-III.
- Start engine and warm it up to normal operating temperature.
- Maintain the following conditions for at least 50 consecutive seconds.

 CAUTION:

Always drive vehicle at a safe speed.

ENG SPEED	1,400 - 6,375 rpm
COOLAN TEMP/S	More than 70 °C (158 °F)
B/FUEL SCHDL	2.0 - 31.8 msec

P0850 PNP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

VHCL SPEED SE	More than 64 km/h (40 mph)
Selector lever	Suitable position

Α

Check 1st trip DTC.

Is 1st trip DTC detected?

EC

YES >> Go to EC-365, "Diagnosis Procedure".

NO >> INSPECTION END

5. PERFORM COMPONENT FUNCTION CHECK

C

®With GST

Perform component function check. Refer to EC-365, "Component Function Check".

NOTE:

D

Е

Use component function check to check the overall function of the PNP signal circuit. During this check, a 1st trip DTC might not be confirmed.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-365, "Diagnosis Procedure".

Component Function Check

INFOID:0000000003856247

1. PERFORM COMPONENT FUNCTION CHECK

With GST

1. Turn ignition switch ON.

2. Check the voltage between ECM harness connector terminals under the following conditions.

Н

	ECM					
Connector	+	-			Voltage (V)	
Connector	Terminal	Terminal				
M107	100	128	129	109 128 Selector lever	P or N	Battery voltage
IVITO7	17 109 128 Selector lever		Except above	Approx. 0		

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-365, "Diagnosis Procedure".

M

Ν

Р

INFOID:0000000003856248

Diagnosis Procedure

1. CHECK DTC WITH TCM

Refer to TM-75, "CONSULT-III Function (TRANSMISSION)".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace malfunctioning part.

2.CHECK STARTING SYSTEM

Turn ignition switch OFF, then turn it to START.

Does starter motor operate?

YES >> GO TO 3.

NO >> Check DTC with BCM. Refer to <u>BCS-16</u>, "COMMON ITEM : CONSULT-III Function (<u>BCM - COM-MON ITEM</u>)".

3.check park/neutral position (pnp) signal circuit for open and short

- 1. Turn ignition switch OFF.
- 2. Disconnect A/T assembly harness connector.
- Disconnect ECM harness connector.
- Check the continuity between A/T assembly harness connector and ECM harness connector.

Revision: 2009 March EC-365 2009 FX35/FX50

A/T ass	embly	EC	Continuity	
Connector Terminal		Connector	Terminal	Continuity
F51	9	M107	109	Existed

5. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5. NO >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F1, E3
- Harness connectors E106, M6
- Harness for open or short between A/T assembly and ECM

>> Repair open circuit, short to ground or short to power in harness or connectors.

5.CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

P1078, P1084 EVT CONTROL POSITION SENSOR

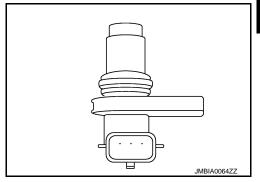
Description INFOID:0000000003856249

Exhaust valve timing (EVT) control position sensor detects the concave groove of the exhaust camshaft rear end.

This sensor signal is used for sensing a position of the exhaust camshaft.

This sensor uses a Hall IC.

Based on the position of the exhaust camshaft, ECM controls exhaust valve timing control magnet retarder to optimize the shut/ open timing of exhaust valve for the driving condition.



DTC Logic INFOID:0000000003856250

DTC DETECTION LOGIC

NOTE:

If DTC P1078 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. Refer to EC-361, "DTC Logic".

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1078	Exhaust valve timing (EVT) control position sensor (bank 1) circuit		Harness or connectors [EVT control position sensor (bank 1) circuit is open or shorted) EVT control position sensor Crankshaft position (CKP) sensor Camshaft position (CMP) sensor (bank 1) Accumulation of debris to the signal pick-up portion of the camshaft
P1084	Exhaust valve timing (EVT) control position sensor (bank 2) circuit	An excessively high or low voltage from the sensor is sent to ECM.	Harness or connectors [EVT control position sensor (bank 2) circuit is open or shorted) (CKP sensor circuit is shorted.) [CMP sensor (bank 2) circuit is shorted.] (Battery current sensor circuit is shorted.) (APP sensor 2 circuit is shorted.) (EVAP control system pressure sensor circuit is shorted.) (Refrigerant pressure sensor circuit is shorted.) (Refrigerant pressure sensor circuit is shorted.) EVT control position sensor (bank 2) CKP sensor CMP sensor (bank 2) Battery current sensor Accelerator pedal position (APP) sensor EVAP control system pressure sensor Refrigerant pressure sensor Accumulation of debris to the signal pick-up portion of the camshaft

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

EC-367 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

F

Р

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine and let it idle for 10 seconds.
- 2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-368, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003856251

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- 2. Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.check exhaust valve timing (evt) control position sensor power supply circuit-i

- 1. Disconnect EVT control position sensor harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between EVT control position sensor harness connector and ground.

DTC	EVT control position sensor			Ground	Voltage (V)
DIC	Bank	Connector Terminal		Ground	voltage (v)
P1078	1	F4	1	Ground	Approx. 5
P1084	2	F19	1	Ground	Αρρίολ. 3

Is the inspection result normal?

YES >> GO TO 8.

NO-1 >> P1078: Repair open circuit, short to ground or short to power in harness or connectors.

NO-2 >> P1084: GO TO 3.

3.CHECK EVT CONTROL POSITION SENSOR POWER SUPPLY CIRCUIT-II

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check the continuity between EVT control position sensor harness connector and ECM harness connector

EVT control position sensor			EC	Continuity	
Bank	Connector	Terminal	Connector	Terminal	Continuity
2	F19	1	F102	64	Existed

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit.

4. CHECK SENSOR POWER SUPPLY CIRCUIT

Check harness for short to power and short to ground, between the following terminals.

ECM Sensor				
Connector	Terminal	Name	Connector	Terminal
F101	46	Crankshaft position (CKP) sensor	F2	1

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

	CM	Sensor			
Connector	Terminal	Name	Connector	Terminal	
		Camshaft position (CMP) sensor (bank 2)	F18	1	
F102	64	EVT control position sensor (bank 2)	F19	1	
		Battery current sensor	E21	1	
	103	Accelerator pedal position (APP) sensor	E112 (Without ICC)	6	
M107	103	Accelerator pedal position (APP) sensor	E116 (With ICC)	3	
	107	EVAP control system pressure sensor	B252	3	
	111	Refrigerant pressure sensor	E77	3	
-		hort to ground or short to power in	namess of co	nnectors.	
CHECK	COMPO	NENTS		nnectors.	
heck the CKP sen CMP sen Battery c	following. sor (Reference of the contract of t		n".) Inspection".) t Inspection".)		on".)
check the CKP sen CMP sen Battery c EVAP co Refrigera	following. sor (Refer nsor (bank surrent ser ntrol syste ant pressu	r to EC-273, "Component Inspection 2) (Refer to EC-279, "Component insor (Refer to EC-402, "Component insor (Refer to EC-3) (Refer to EC-3) re sensor (Refer to HAC-85, "Diagram in the property of the proper	n".) Inspection".) t Inspection".) 15, "Compone	ent Inspectio	<u>on"</u> .)
heck the CKP sen CMP sen Battery c EVAP co Refrigera	following. sor (Reference (Refere	r to EC-273, "Component Inspection 2) (Refer to EC-279, "Component Inspection 2) (Refer to EC-402, "Component Inspection 2) (Refer to EC-402, "Component Inspection 2) (Refer to EC-3) (Refer to EC-3) (Refer to EC-3) (Refer to EAC-85, "Diagral 2) (It normal)	n".) Inspection".) t Inspection".) 15, "Compone	ent Inspectio	<u>on"</u> .)
check the CKP sen CMP sen Battery c EVAP co Refrigera the inspe	following. sor (Reference (Refere	r to EC-273, "Component Inspection 2) (Refer to EC-279, "Component insor (Refer to EC-402, "Component em pressure sensor (Refer to EC-3 re sensor (Refer to HAC-85, "Diagral ult normal?	n".) Inspection".) t Inspection".) 15, "Compone	ent Inspectio	<u>on"</u> .)
check the CKP sen CMP sen Battery con Refrigera the inspect of the control of the	following. sor (Reference of the last following) sor (bank four rent serent following) sort of the last following fo	r to EC-273, "Component Inspection 2) (Refer to EC-279, "Component Inspection 2) (Refer to EC-279, "Component Insor (Refer to EC-402, "Component Insor (Refer to EC-3) (Refer	n".) Inspection".) t Inspection".) 15, "Compone	ent Inspectio	<u>on"</u> .)
CHECK Check the CKP sen CMP sen Battery c EVAP co Refrigera the inspe YES >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>	following. sor (Reference of the content of the con	r to EC-273, "Component Inspection 2) (Refer to EC-279, "Component insor (Refer to EC-402, "Component insor (Refer to EC-3) (Refer to EC-3) re sensor (Refer to HAC-85, "Diagral ult normal? 6. malfunctioning component. NSOR	n".) Inspection".) t Inspection".) 15, "Compone	ent Inspectio	<u>on"</u> .)
check the CKP sen CMP sen Battery con Refrigera the inspect YES >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>	following. sor (Reference to the control system of the control sys	r to EC-273, "Component Inspection 2) (Refer to EC-279, "Component Inspection 2) (Refer to EC-402, "Component Insor (Refer to EC-402, "Component Insor (Refer to EC-3) (Refer	n".) Inspection".) t Inspection".) 15, "Compone	ent Inspectio	<u>on"</u> .)
check the CKP sen CMP sen Battery con Refrigera the inspect YES > NO > CHECK sefer to EG the inspect the inspect CHECK sefer to EG the EG the inspect CHECK sefer to EG the EG	following. sor (Reference to the control system of the control sys	r to EC-273, "Component Inspection 2) (Refer to EC-279, "Component as or (Refer to EC-402, "Component as or (Refer to EC-3) re sensor (Refer to HAC-85, "Diagral and the normal? 6. malfunctioning component. NSOR Component Inspection Component and the normal? Component and the normal	n".) Inspection".) t Inspection".) 15, "Compone	ent Inspectio	<u>on"</u> .)
check the CKP sen CMP sen Battery con Refrigera the inspection of the control of	following. sor (Reference of Reference of Reference of Reference of Replace of APP SEN	r to EC-273, "Component Inspection 2) (Refer to EC-279, "Component as or (Refer to EC-402, "Component as or (Refer to EC-3) re sensor (Refer to HAC-85, "Diagral and the component as of t	n".) Inspection".) t Inspection".) 15, "Compone	ent Inspectio	on".)

- Replace accelerator pedal assembly.
- Go to EC-447, "Special Repair Requirement".

>> INSPECTION END

8.CHECK EVT CONTROL POSITION SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- Disconnect ECM harness connector.

Check the continuity between EVT control position sensor harness connector and ECM harness connector.

DTC	EVT	control position	on sensor	ECM		Continuity
БТО	Bank	Connector	Terminal	Connector	Terminal	Continuity
P1078	1	F4	2	F102	88	Existed
P1084	2	F19	2	1 102	30	LAISIGU

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 9.

>> Repair open circuit, short to ground or short to power in harness or connectors. NO

EC-369 Revision: 2009 March 2009 FX35/FX50

Ν

0

Р

[VQ35HR]

9. CHECK EVT CONTROL POSITION SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between exhaust valve timing control position sensor harness connector and ECM harness connector.

DTC	EVT	EVT control position sensor ECM		ECM		Continuity
ыс	Bank	Connector	Terminal	Connector	Terminal	Continuity
P1078	1	F4	3	F102	58	Existed
P1084	2	F19	3	F 102	62	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 11. NO >> GO TO 10.

10. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F107, F106
- Harness for open or short between EVT control position sensor and ECM

>> Repair open circuit, short to ground or short to power in harness or connectors.

11. CHECK EVT CONTROL POSITION SENSOR

Refer to EC-371, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 12.

NO >> Replace malfunctioning EVT control position sensor.

12. CHECK CKP SENSOR

Refer to EC-273, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 13.

NO >> Replace CKP sensor.

13. CHECK CMP SENSOR

Refer to EC-279, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 14.

NO >> Replace malfunctioning CMP sensor.

14. CHECK CAMSHAFT (EXH)

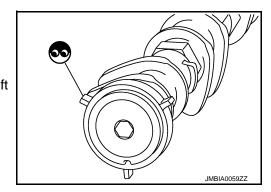
Check the following.

- · Accumulation of debris to the signal plate of camshaft rear end
- Chipping signal plate of camshaft rear end

Is the inspection result normal?

YES >> GO TO 15.

NO >> Remove debris and clean the signal plate of camshaft rear end or replace camshaft.



15. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

>> INSPECTION END

Component Inspection

INFOID:0000000003856252

1.exhaust valve timing control position sensor-i

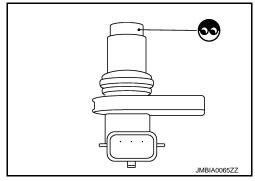
- 1. Turn ignition switch OFF.
- 2. Disconnect exhaust valve timing control position sensor harness connector.
- 3. Loosen the fixing bolt of the sensor.
- 4. Remove the sensor.
- 5. Visually check the sensor for chipping.

Is the inspection result normal?

YES >> GO TO 2.

NO

>> Replace malfunctioning exhaust valve timing control position sensor.



2.EXHAUST VALVE TIMING CONTROL POSITION SENSOR-II

Check resistance exhaust valve timing control position sensor terminals as shown below.

Terminals	Resistance
1 (+) - 2 (-)	
1 (+) - 3 (-)	Except 0 or ∞ Ω [at 25°C (77°F)]
2 (+) - 3 (-)	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace malfunctioning exhaust valve timing control position sensor.

F

D

Е

Α

EC

Н

I

U

L

K

M

Ν

0

Р

P1148, P1168 CLOSED LOOP CONTROL

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

P1148, P1168 CLOSED LOOP CONTROL

DTC Logic

DTC DETECTION LOGIC

NOTE:

DTC P1148 or P1168 is displayed with another DTC for air fuel ratio (A/F) sensor 1. Perform the trouble diagnosis for the corresponding DTC.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1148	Closed loop control function (bank 1)	The closed loop control function for bank 1 does not operate even when vehicle is being driven in the specified condition.	Harness or connectors (The A/F sensor 1 circuit is open or shorted.)
P1168	Closed loop control function (bank 2)	The closed loop control function for bank 2 does not operate even when vehicle is being driven in the specified condition.	A/F sensor 1 A/F sensor 1 heater

P1211 TCS CONTROL UNIT [VQ35HR] < DTC/CIRCUIT DIAGNOSIS > P1211 TCS CONTROL UNIT Α Description INFOID:0000000003856254 The malfunction information related to TCS is transferred through the CAN communication line from "ABS EC actuator and electric unit (control unit)" to ECM. Be sure to erase the malfunction information such as DTC not only for "ABS actuator and electric unit (control unit)" but also for ECM after TCS related repair. **DTC** Logic INFOID:0000000003856255 DTC DETECTION LOGIC D Freeze frame data is not stored in the ECM for this self-diagnosis. DTC No. Trouble diagnosis name DTC detecting condition Possible cause Е · ABS actuator and electric unit (control ECM receives malfunction information from P1211 TCS control unit "ABS actuator and electric unit (control unit)". · TCS related parts DTC CONFIRMATION PROCEDURE 1.PRECONDITIONING **TESTING CONDITION:** Before performing the following procedure, confirm that battery voltage is more than 10.5 V at idle. Н >> GO TO 2. 2.PERFORM DTC CONFIRMATION PROCEDURE Start engine and let it idle for at least 60 seconds. Check 1st trip DTC. Is 1st trip DTC detected? YES >> EC-373, "Diagnosis Procedure" NO >> INSPECTION END Diagnosis Procedure INFOID:0000000003856256 Go to BRC-5, "Work Flow".

Revision: 2009 March EC-373 2009 FX35/FX50

Ν

Р

P1212 TCS COMMUNICATION LINE

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

INFOID:000000003856259

P1212 TCS COMMUNICATION LINE

Description INFOID.000000003856257

This CAN communication line is used to control the smooth engine operation during the TCS operation. Pulse signals are exchanged between ECM and "ABS actuator and electric unit (control unit)".

Be sure to erase the malfunction information such as DTC not only for "ABS actuator and electric unit (control unit)" but also for ECM after TCS related repair.

DTC Logic

DTC DETECTION LOGIC

NOTE:

- If DTC P1212 is displayed with DTC UXXXX, first perform the trouble diagnosis for DTC UXXXX.
- If DTC P1212 is displayed with DTC P0607, first perform the trouble diagnosis for DTC P0607. Refer to <u>EC-360</u>, "<u>DTC Logic"</u>.

Freeze frame data is not stored in the ECM for this self-diagnosis.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1212	TCS communication line	ECM cannot receive the information from "ABS actuator and electric unit (control unit)" continuously.	Harness or connectors (The CAN communication line is open or shorted.) ABS actuator and electric unit (control unit) Dead (Weak) battery

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10.5 V at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine and let it idle for at least 10 seconds.
- 2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-374, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

Go to BRC-5, "Work Flow".

Revision: 2009 March EC-374 2009 FX35/FX50

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR1

P1217 ENGINE OVER TEMPERATURE

DTC Logic INFOID:0000000003856260

DTC DETECTION LOGIC

NOTE:

- If DTC P1217 is displayed with DTC UXXXX, first perform the trouble diagnosis for DTC UXXXX.
- If DTC P1217 is displayed with DTC P0607, first perform the trouble diagnosis for DTC P0607. Refer to EC-360, "DTC Logic".

If the cooling fan or another component in the cooling system malfunctions, engine coolant temperature will

When the engine coolant temperature reaches an abnormally high temperature condition, a malfunction is indicated.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1217	Engine over tempera- ture (Overheat)	 Cooling fan does not operate properly (Overheat). Cooling fan system does not operate properly (Overheat). Engine coolant was not added to the system using the proper filling method. Engine coolant is not within the specified range. 	 Harness or connectors (The cooling fan circuit is open or shorted.) IPDM E/R Cooling fan relay Cooling fan control module Cooling fan motor Radiator hose Radiator Radiator cap Water pump Thermostat

CAUTION:

When a malfunction is indicated, always replace the coolant. Refer to CO-8, "Draining" and CO-9, <u>"Refilling"</u>. Also, replace the engine oil. Refer to <u>LU-8, "Draining"</u>and <u>LU-8, "Refilling"</u>.

- Fill radiator with coolant up to specified level with a filling speed of 2 liters per minute. Always use coolant with the proper mixture ratio. Refer to MA-13, "Anti-Freeze Coolant Mixture Ratio".
- 2. After refilling coolant, run engine to ensure that no water-flow noise is emitted.

DTC CONFIRMATION PROCEDURE

1. PERFORM COMPONENT FUNCTION CHECK

Perform component function check. Refer to EC-375, "Component Function Check".

Use component function check to check the overall function of the cooling fan. During this check, a DTC might not be confirmed.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-376, "Diagnosis Procedure".

Component Function Check

1. PERFORM COMPONENT FUNCTION CHECK-I

WARNING:

Never remove the radiator cap when the engine is hot. Serious burns could be caused by high pressure fluid escaping from the radiator.

Wrap a thick cloth around cap. Carefully remove the cap by turning it a guarter turn to allow built-up pressure to escape. Then turn the cap all the way off.

EC-375 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

Н

K

M

N

INFOID:0000000003856261

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

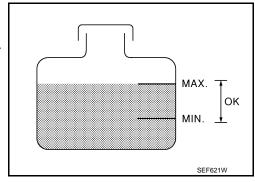
Check the coolant level in the reservoir tank and radiator.

Allow engine to cool before checking coolant level.

<u>Is the coolant level in the reservoir tank and/or radiator below the proper range?</u>

YES >> Go to EC-376, "Diagnosis Procedure".

NO >> GO TO 2.



2.PERFORM COMPONENT FUNCTION CHECK-II

Confirm whether customer filled the coolant or not.

Did customer fill the coolant?

YES >> Go to EC-376, "Diagnosis Procedure".

NO >> GO TO 3.

3.perform component function check-iii

(I) With CONSULT-III

- 1. Turn ignition switch ON.
- 2. Perform "FAN DUTY CONTROL" in "ACTIVE TEST" mode with CONSULT-III.
- 3. Check that cooling fan speed varies according to the percentage.

Without CONSULT-III

Perform IPDM E/R auto active test and check cooling fan motors operation, refer to <u>PCS-11, "Diagnosis Description"</u>.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-376, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003856262

1. CHECK COOLING FAN OPERATION

(III) With CONSULT-III

- 1. Turn ignition switch ON.
- 2. Perform "FAN DUTY CONTROL" in "ACTIVE TEST" mode with CONSULT-III.
- 3. Check that cooling fan speed varies according to the percentage.

Without CONSULT-III

- Perform IPDM E/R auto active test and check cooling fan motors operation, refer to <u>PCS-11, "Diagnosis Description"</u>.
- Check that cooling fan operates.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Go to EC-466, "Diagnosis Procedure".

2.CHECK COOLING SYSTEM FOR LEAK-I

Check cooling system for leak. Refer to CO-8, "Inspection".

Is leakage detected?

YES >> GO TO 3.

NO >> GO TO 4.

3.CHECK COOLING SYSTEM FOR LEAK-II

Check the following for leak.

- Hose
- Radiator
- Water pump

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

>> Repair or replace malfunctioning part.

4. CHECK RADIATOR CAP

Check radiator cap. Refer to CO-12, "RADIATOR CAP: Inspection".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace radiator cap.

5. CHECK THERMOSTAT

Check thermostat. Refer to CO-23, "Inspection".

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace thermostat

6.CHECK ENGINE COOLANT TEMPERATURE SENSOR

Refer to EC-190, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace engine coolant temperature sensor.

7. CHECK MAIN 12 CAUSES

If the cause cannot be isolated, check the following.

Engine	Step	Inspection item	Equipment	Standard	Reference page
OFF	1	Blocked radiator Blocked condenser Blocked radiator grille Blocked bumper	Visual	No blocking	_
	2	Coolant mixture	Coolant tester	_	CO-8, "Inspection"
	3	Coolant level	Visual	Coolant up to MAX level in reservoir tank and radiator filler neck	CO-8, "Inspection"
	4	Radiator cap	Pressure tester	_	CO-12, "RADIATOR CAP : Inspection"
ON* ²	5	Coolant leaks	Visual	No leaks	CO-8, "Inspection"
ON* ²	6	Thermostat	Touch the upper and lower radiator hoses	Both hoses should be hot	CO-23, "Inspection"
ON* ¹	7	Cooling fan	CONSULT-III	Operating	EC-466, "Component Function Check"
OFF	8	Combustion gas leak	Color checker chemical tester 4 Gas analyzer	Negative	_
ON* ³	9	Coolant temperature gauge	Visual	Gauge less than 3/4 when driving	_
		Coolant overflow to reservoir tank	Visual	No overflow during driving and idling	CO-8, "Inspection"
OFF* ⁴	10	Coolant return from reservoir tank to radiator	Visual	Should be initial level in reservoir tank	CO-8, "Inspection"
OFF	11	Cylinder head	Straight gauge feeler gauge	0.1 mm (0.004 in) Maximum distortion (warping)	EM-114, "Inspection"
	12	Cylinder block and pistons	Visual	No scuffing on cylinder walls or piston	EM-126, "Inspection"

^{*1:} Turn the ignition switch ON.

Α

EC

D

Е

F

Н

Ν

Р

EC-377

^{*2:} Engine running at 3,000 rpm for 10 minutes.

^{*3:} Drive at 90 km/h (56 MPH) for 30 minutes and then let idle for 10 minutes.

^{*4:} After 60 minutes of cool down time.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

For more information, refer to CO-4, "Troubleshooting Chart".

>> INSPECTION END

[VQ35HR]

Α

EC

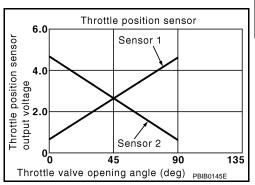
Е

P1225. P1234 TP SENSOR

Description INFOID:0000000004057406

Electric throttle control actuator consists of throttle control motor, throttle position (TP) sensor, etc. The throttle position sensor responds to the throttle valve movement.

The throttle position sensor has two sensors. These sensors are a kind of potentiometers which transform the throttle valve position into output voltage, and emit the voltage signal to the ECM. In addition, these sensors detect the opening and closing speed of the throttle valve and feed the voltage signals to the ECM. The ECM judges the current opening angle of the throttle valve from these signals and the ECM controls the throttle control motor to make the throttle valve opening angle properly in response to driving condition.



DTC Logic INFOID:0000000003856264

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	
P1225	Closed throttle position learning per- formance (bank 1)	Closed throttle position learning value	Electric throttle control actuator Throttle position (TP) concer 1 and	
P1234	Closed throttle position learning per- formance (bank 2)	is excessively low.	[Throttle position (TP) sensor 1 and 2]	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10 V at idle.

2.PERFORM DTC CONFIRMATION PROCEDURE

Turn ignition switch ON.

>> GO TO 2.

- 2. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-379, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

${f 1}$.CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

- Turn ignition switch OFF.
- Remove the intake air duct.

Н

N

INFOID:0000000003856265

P1225, P1234 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

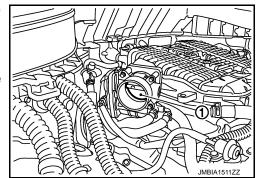
Check if foreign matter is caught between the throttle valve (1) and the housing.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Remove

>> Remove the foreign matter and clean the electric throttle control actuator inside.



2.REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

- 1. Replace malfunctioning electric throttle control actuator.
- 2. Go to EC-380, "Special Repair Requirement".

>> INSPECTION END

Special Repair Requirement

INFOID:0000000003856266

1. PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Refer to EC-25, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement"

>> GO TO 2.

2.PERFORM IDLE AIR VOLUME LEARNING

Refer to EC-25, "IDLE AIR VOLUME LEARNING: Special Repair Requirement"

>> END

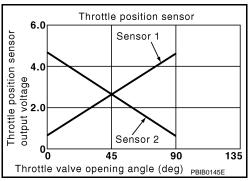
[VQ35HR]

P1226, P1235 TP SENSOR

Description INFOID:0000000004057407

Electric throttle control actuator consists of throttle control motor, throttle position (TP) sensor, etc. The throttle position sensor responds to the throttle valve movement.

The throttle position sensor has two sensors. These sensors are a kind of potentiometers which transform the throttle valve position into output voltage, and emit the voltage signal to the ECM. In addition, these sensors detect the opening and closing speed of the throttle valve and feed the voltage signals to the ECM. The ECM judges the current opening angle of the throttle valve from these signals and the ECM controls the throttle control motor to make the throttle valve opening angle properly in response to driving condition.



DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	
P1226	Closed throttle position learning performance (bank 1)	Closed throttle position learning is not performed	Electric throttle control actuator Throttle position (TP) coppor 1	
P1235	Closed throttle position learning performance (bank 2)	successfully, repeatedly.	[Throttle position (TP) sensor 1 and 2]	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10 V at idle.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.

>> GO TO 2.

- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Turn ignition switch ON.
- 4. Repeat steps 2 and 3 for 32 times.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-381, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1. CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

- 1. Turn ignition switch OFF.
- 2. Remove the intake air duct.

EC

Α

Е

F

Н

. .

N

INFOID:0000000003856269

P1226, P1235 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

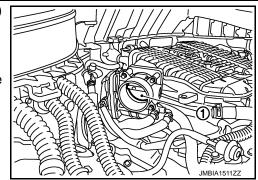
Check if foreign matter is caught between the throttle valve (1) and the housing.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Remove

>> Remove the foreign matter and clean the electric throttle control actuator inside.



2.REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

- 1. Replace malfunctioning electric throttle control actuator.
- 2. Go to EC-382, "Special Repair Requirement".

>> INSPECTION END

Special Repair Requirement

INFOID:0000000003856270

1. PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Refer to EC-25, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement"

>> GO TO 2.

2.PERFORM IDLE AIR VOLUME LEARNING

Refer to EC-25, "IDLE AIR VOLUME LEARNING: Special Repair Requirement"

>> END

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

P1233, P2101 ELECTRIC THROTTLE CONTROL FUNCTION

Description INFOID:0000000003856271

Electric throttle control actuator consists of throttle control motor, throttle position sensor, etc.

The throttle control motor is operated by the ECM and it opens and closes the throttle valve.

The current opening angle of the throttle valve is detected by the throttle position sensor. The throttle position sensor provides feedback to the ECM, when open/closes the throttle valve in response to driving conditions via the throttle control motor.

DTC Logic INFOID:0000000003856272

DTC DETECTION LOGIC

NOTE:

If DTC P1233 or P2101 is displayed with DTC P1238, P2119, first perform the trouble diagnosis for DTC P1238, P2119. Refer to EC-390, "DTC Logic".

If DTC P2101 or P2101 is displayed with DTC P1290, P2100, first perform the trouble diagnosis for DTC P1290, P2100. Refer to EC-395, "DTC Logic".

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1233	Electric throttle control performance (bank 2)	Electric throttle control function does not oper-	Harness or connectors (Throttle control motor circuit is open or
P2101	Electric throttle control performance (bank 1)	ate properly.	shorted) • Electric throttle control actuator

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 11 V when engine is running.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- Turn ignition switch ON and wait at least 2 seconds.
- 2. Start engine and let it idle for 5 seconds.
- Check DTC.

Is DTC detected?

YFS >> Go to EC-383, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1. CHECK GROUND CONNECTION

- Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK THROTTLE CONTROL MOTOR RELAY INPUT SIGNAL CIRCUIT-I

Check the voltage between ECM harness connector terminals as follows.

EC-383 Revision: 2009 March 2009 FX35/FX50

EC

Α

C

D

Е

F

K

L

N

INFOID:0000000003856273

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

		E	СМ			
DTC	-	+		_	Condition	Voltage (V)
	Connector	Terminal	Connector	Terminal		
P1233	F102	52			Ignition switch OFF	Approx. 0
1 1200	1 102	32	M107	128	Ignition switch ON	Battery voltage
P2101	F101	3	IVITO	120	Ignition switch OFF	Approx. 0
1 2 101	1 101	3			Ignition switch ON	Battery voltage

Is the inspection result normal?

YES >> GO TO 9.

NO >> GO TO 3.

${f 3.}$ CHECK THROTTLE CONTROL MOTOR RELAY POWER SUPPLY CIRCUIT

- 1. Turn ignition switch OFF.
- Disconnect ECM harness connector.
- 3. Disconnect IPDM E/R harness connector E7.
- 4. Check the continuity between IPDM E/R harness connector and ECM harness connector.

IPDM	E/R	EC	CM	Continuity
Connector	Terminal	Connector	Terminal	Continuity
E7	70	F101	25	Existed

5. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5. NO >> GO TO 4.

f 4.DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E3, F1
- Harness connectors F104, F105
- Harness for open or short between ECM and IPDM E/R

>> Repair open circuit, short to ground or short to power in harness or connectors.

5. CHECK THROTTLE CONTROL MOTOR RELAY INPUT SIGNAL CIRCUIT-II

1. Check the continuity between IPDM E/R harness connector and ECM harness connector.

DTC	IPDM	E/R	EC	CM	Continuity
Dio	Connector	Terminal	Connector	Terminal	Continuity
P1233	F7	54	F102	52	Existed
P2101	E7	54	F101	3	LAISIEU

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 6.

O. DETECT MALFUNCTIONING PART

Check the following.

- · Harness connectors E3, F1
- Harness for open or short between ECM and IPDM E/R
 - >> Repair open circuit, short to ground or short to power in harness or connectors.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

7. CHECK FUSE

- Disconnect 15 A fuse (No. 51) from IPDM E/R.
- 2. Check if 15 A fuse is blown.

Is the inspection result normal?

YES >> GO TO 8.

NO >> Replace 15 A fuse.

8. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace IPDM E/R.

NO >> Repair or replace harness or connectors.

9.check throttle control motor output signal circuit for open or short

- Turn ignition switch OFF.
- Disconnect electric throttle control actuator harness connector.
- Disconnect ECM harness connector.
- 4. Check the continuity between electric throttle control actuator harness connector and ECM harness connector.

DTC	Electri	c throttle cont	rol actuator	EC	CM	Continuity
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity
			5		49	Existed
P1233	2	F27	3	F102	50	Not existed
F 1233		Γ21	6	F 102	49	Not existed
			0		50	Existed
			1		2	Existed
P2101	1	F6	'	F101	4	Not existed
FZ101	'	1.0	2	1 101	2	Not existed
					4	Existed

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair or replace malfunctioning part.

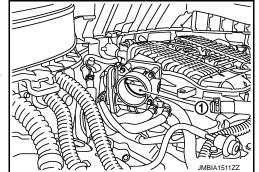
10.CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

- Remove the intake air duct.
- Check if foreign matter is caught between the throttle valve (1) and the housing.

Is the inspection result normal?

YES >> GO TO 11.

NO >> Remove the foreign matter and clean the electric throttle control actuator inside.



11. CHECK THROTTLE CONTROL MOTOR

Refer to EC-386, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 12. NO >> GO TO 13.

EC-385 Revision: 2009 March 2009 FX35/FX50

EC

D

Е

Ν

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

12. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

Is the inspection result normal?

YES >> GO TO 13.

NO >> Repair or replace harness or connectors.

13. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

- 1. Replace malfunction electric throttle control actuator.
- Go to <u>EC-386</u>, "Special Repair Requirement".

>> INSPECTION END

Component Inspection

INFOID:0000000003856274

1. CHECK THROTTLE CONTROL MOTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect electric throttle control actuator harness connector.
- 3. Check resistance between electric throttle control actuator terminals as follows.

Electric th	rottle control actuator	Resistance
Bank	Terminals	ixesisiance
1	1 and 2	Approx. 1 - 15 Ω [at 25°C (77°F)]
2	5 and 6	Αρρίολ: 1 - 13 \$2 [at 23 G (77 1)]

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.replace electric throttle control actuator

- 1. Replace malfunctioning electric throttle control actuator.
- 2. Go to EC-386, "Special Repair Requirement".

>> INSPECTION END

Special Repair Requirement

INFOID:0000000003856275

2009 FX35/FX50

1. PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Refer to EC-25, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement"

>> GO TO 2.

2.PERFORM IDLE AIR VOLUME LEARNING

Refer to EC-25, "IDLE AIR VOLUME LEARNING: Special Repair Requirement"

>> END

P1236, P2118 THROTTLE CONTROL MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

P1236, P2118 THROTTLE CONTROL MOTOR

Description INFOID:0000000003856276

The throttle control motor is operated by the ECM and it opens and closes the throttle valve.

The current opening angle of the throttle valve is detected by the throttle position sensor. The throttle position sensor provides feedback to the ECM, when opens/closes the throttle valve in response to driving conditions via the throttle control motor.

DTC Logic INFOID:0000000003856277

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1236	Throttle control motor (bank 2) circuit short	ECM detects short in both circuits between	Harness or connectors (Throttle control motor circuit is shorted.)
P2118	Throttle control motor (bank 1) circuit short	ECM and throttle control motor.	Electric throttle control actuator (Throttle control motor)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.perform dtc confirmation procedure

- Turn ignition switch ON and wait at least 2 seconds.
- Start engine and let it idle for 5 seconds. 2.
- Check DTC.

Is DTC detected?

YES >> Go to EC-387, "Diagnosis Procedure".

>> INSPECTION END NO

Diagnosis Procedure

1. CHECK GROUND CONNECTION

Turn ignition switch OFF.

Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.check throttle control motor output signal circuit for open and short

- Disconnect electric throttle control actuator harness connector.
- Disconnect ECM harness connector. 2.
- Check the continuity between electric throttle control actuator harness connector and ECM harness connector.

EC

Α

D

F

Н

K

INFOID:0000000003856278

M

Ν

2009 FX35/FX50

EC-387 Revision: 2009 March

DTC	Electri	c throttle cont	rol actuator	EC	CM	Continuity
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity
			5		49	Existed
P1236	2	F27	3	F102	50	Not existed
1 1230		1 21	6	1 102	49	Not existed
			0		50	Existed
			1		2	Existed
P2118	1	F6	'	F101	4	Not existed
FZIIO	'	10	2	1 101	2	Not existed
			2		4	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace malfunctioning part.

3.check throttle control motor

Refer to EC-388, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 5.

4. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace harness or connectors.

REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

- Replace malfunctioning electric throttle control actuator.
- Go to EC-389, "Special Repair Requirement".

>> INSPECTION END

Component Inspection

INFOID:0000000003856279

1. CHECK THROTTLE CONTROL MOTOR

- Turn ignition switch OFF.
- Disconnect electric throttle control actuator harness connector.
- Check resistance between electric throttle control actuator terminals as follows.

Electric th	rottle control actuator	Resistance
Bank	Terminals	resistance
1	1 and 2	Approx. 1 - 15 Ω [at 25°C (77°F)]
2	5 and 6	Αρριολ. 1 - 13 32 [at 23 G (77 1)]

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.replace electric throttle control actuator

- 1. Replace malfunctioning electric throttle control actuator.
- 2. Go to EC-389, "Special Repair Requirement".

P1236, P2118 THROTTLE CONTROL MOTOR [VQ35HR] < DTC/CIRCUIT DIAGNOSIS > Α >> INSPECTION END Special Repair Requirement INFOID:0000000003856280 EC $1.\mathsf{perform}$ throttle valve closed position learning Refer to EC-25, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement" C >> GO TO 2. 2. PERFORM IDLE AIR VOLUME LEARNING D Refer to EC-25, "IDLE AIR VOLUME LEARNING: Special Repair Requirement" >> END Е F Н K

Revision: 2009 March EC-389 2009 FX35/FX50

M

Ν

P1238, P2119 ELECTRIC THROTTLE CONTROL ACTUATOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

P1238, P2119 ELECTRIC THROTTLE CONTROL ACTUATOR

Description INFOID:000000003856281

Electric throttle control actuator consists of throttle control motor, throttle position sensor, etc.

The throttle control motor is operated by the ECM and it opens and closes the throttle valve.

The throttle position sensor detects the throttle valve position, and the opening and closing speed of the throttle valve and sends the voltage signals to the ECM. The ECM judges the current opening angle of the throttle valve from these signals and opens/closes the throttle valve in response to driving conditions via the throttle control motor.

DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name		DTC detecting condition	Possible cause
	Electric throttle control	A)	Electric throttle control actuator does not function properly due to the return spring malfunction.	
P1238	actuator (bank 2)	B)	Throttle valve opening angle in fail-safe mode is not in specified range.	
		C)	ECM detect the throttle valve is stuck open.	
		A)	Electric throttle control actuator does not function properly due to the return spring malfunction.	Electric throttle control actuator
P2119	Electric throttle control actuator (bank 1)	B)	Throttle valve opening angle in fail-safe mode is not in specified range.	
		C)	ECM detects that the throttle valve is stuck open.	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.perform dtc confirmation procedure for malfunction a and b

- 1. Turn ignition switch ON and wait at least 1 second.
- 2. Shift selector lever position to D and wait at least 3 seconds.
- 3. Shift selector lever position to P.
- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Turn ignition switch ON and wait at least 1 second.
- 6. Shift selector lever position to D and wait at least 3 seconds.
- 7. Shift selector lever position to P.
- 8. Turn ignition switch OFF, wait at least 10 seconds, and then turn ON.
- 9. Check DTC.

Is DTC detected?

YES >> Go to EC-391, "Diagnosis Procedure".

NO >> GO TO 3.

3.perform dtc confirmation procedure for malfunction c

- 1. Turn ignition switch ON and wait at least 1 second.
- 2. Shift selector lever position to D and wait at least 3 seconds.

P1238, P2119 ELECTRIC THROTTLE CONTROL ACTUATOR

< DTC/CIRCUIT DIAGNOSIS > [VQ35HR]

- 3. Shift selector lever position to P.
- 4. Start engine and let it idle for 3 seconds.
- Check DTC.

Is DTC detected?

YES >> Go to EC-391, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003856283

Α

EC

D

Е

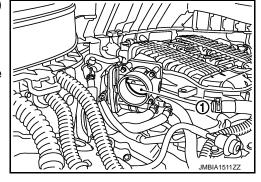
1.check electric throttle control actuator visually

- 1. Turn ignition switch OFF.
- 2. Remove the intake air duct.
- 3. Check if foreign matter is caught between the throttle valve (1) and the housing.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Remove the foreign matter and clean the electric throttle control actuator inside.



2. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

- 1. Replace malfunctioning electric throttle control actuator.
- 2. Go to EC-391, "Special Repair Requirement".

>> INSPECTION END

Special Repair Requirement

INFOID:0000000003856284

1. PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Refer to EC-25, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement"

>> GO TO 2.

2.perform idle air volume learning

Refer to EC-25, "IDLE AIR VOLUME LEARNING: Special Repair Requirement"

>> END

M

L

Ν

Р

Revision: 2009 March EC-391 2009 FX35/FX50

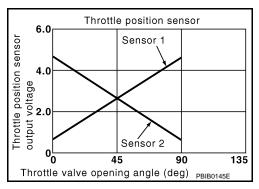
INFOID:0000000003856286

P1239, P2135 TP SENSOR

Description INFOID:000000004057424

Electric throttle control actuator consists of throttle control motor, throttle position (TP) sensor, etc. The throttle position sensor responds to the throttle valve movement.

The throttle position sensor has two sensors. These sensors are a kind of potentiometers which transform the throttle valve position into output voltage, and emit the voltage signal to the ECM. In addition, these sensors detect the opening and closing speed of the throttle valve and feed the voltage signals to the ECM. The ECM judges the current opening angle of the throttle valve from these signals and the ECM controls the throttle control motor to make the throttle valve opening angle properly in response to driving condition.



DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P1239 or P2135 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. Refer to EC-361, "DTC Logic".

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1239	Throttle position (TP) sensor (bank 2) circuit range/performance	Rationally incorrect voltage is sent to ECM compared with the signals from TP sensor 1	Harness or connector (TP sensor 1 and 2 circuit is open or shorted.)
P2135	Throttle position (TP) sensor (bank 1) circuit range/performance	and TP sensor 2.	Electric throttle control actuator (TP sensor 1 and 2)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10 V at idle.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- Start engine and let it idle for 1 second.
- 2. Check DTC.

Is DTC detected?

YES >> Go to EC-392, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003856287

1. CHECK GROUND CONNECTION

- Turn ignition switch OFF.
- 2. Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

P1239, P2135 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

NO >> Repair or replace ground connection.

2.check throttle position sensor power supply circuit

- Disconnect electric throttle control actuator harness connector.
- Turn ignition switch ON.
- Check the voltage between electric throttle control actuator harness connector and ground.

ΞC	
-	\sim

Α

DTC	Electr	ic throttle cont	rol actuator	Ground	Voltage (V)
ыс	Bank	Connector	Terminal	Ground	voltage (v)
P1239	2	F27	1	Ground	Approx. 5
P2135	1	F6	6	Ground	Арргох. 3

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

3.check throttle position sensor ground circuit for open and short

- Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check the continuity between electric throttle control actuator harness connector and ECM harness connector.

\cap
\ ¬

DTC	Electri	c throttle conti	ontrol actuator ECM		Continuity	
ыс	Bank	Connector	Terminal	Connector	Terminal	Continuity
P1239	2	F27	4	F101	48	Existed
P2135	1	F6	3	1 101	40	LAISIEU

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

f 4.CHECK THROTTLE POSITION SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

Check the continuity between electric throttle control actuator harness connector and ECM harness connector.

DTC		Electric throttle control actuator			ECM		Continuity
	ыс	Bank	Connector	Terminal	Connector	Terminal	Continuity
	P1239	2	F27	2		31	· · · · · · · · · · · · · · · · · · ·
	F 1239	2	121	3	F101	35	Existed
	P2135	5 1 F6		4	1 101	30	LXISIEU
	1 2 100	'	10	5		34	

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

${f 5.}$ CHECK THROTTLE POSITION SENSOR

Refer to EC-394, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6.

O.REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

Replace malfunctioning electric throttle control actuator.

EC-393 Revision: 2009 March

Е

Н

K

L

N

2009 FX35/FX50

< DTC/CIRCUIT DIAGNOSIS >

2. EC-394, "Special Repair Requirement"

>> INSPECTION END

7. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000003856288

1. CHECK THROTTLE POSITION (TP) SENSOR

- 1. Turn ignition switch OFF.
- 2. Reconnect all harness connectors disconnected.
- 3. Perform EC-25, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement".
- 4. Turn ignition switch ON.
- Set selector lever position to D.
- 6. Check the voltage between ECM harness connector terminals under the following conditions.

ECM				
Connector	+	-	Condition	Voltage (V)
Connector	Terminal Termi			
	30	40	Accelerator pedal: Fully released	More than 0.36
F101 -	[TP sensor 1 (bank 1)]		Accelerator pedal: Fully depressed	Less than 4.75
	31 [TP sensor 1 (bank 2)]	48	Accelerator pedal: Fully released	More than 0.36
			Accelerator pedal: Fully depressed	Less than 4.75
	34	40	Accelerator pedal: Fully released	Less than 4.75
	[TP sensor 2 (bank 1)]		Accelerator pedal: Fully depressed	More than 0.36
	35	48	Accelerator pedal: Fully released	Less than 4.75
	[TP sensor 2 (bank 2)]		Accelerator pedal: Fully depressed	More than 0.36

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.replace electric throttle control actuator

- 1. Replace malfunctioning electric throttle control actuator.
- 2. Go to EC-394, "Special Repair Requirement".

>> INSPECTION END

Special Repair Requirement

INFOID:0000000003856289

1. PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Refer to EC-25, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement"

>> GO TO 2.

2.PERFORM IDLE AIR VOLUME LEARNING

Refer to EC-25, "IDLE AIR VOLUME LEARNING: Special Repair Requirement"

>> END

P1290, P2100, P2103 THROTTLE CONTROL MOTOR RELAY

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

P1290, P2100, P2103 THROTTLE CONTROL MOTOR RELAY

Description INFOID:000000003856290

Power supply for the throttle control motor is provided to the ECM via throttle control motor relay. The throttle control motor relay is ON/OFF controlled by the ECM. When the ignition switch is turned ON, the ECM sends an ON signal to throttle control motor relay and battery voltage is provided to the ECM. When the ignition switch is turned OFF, the ECM sends an OFF signal to throttle control motor relay and battery voltage is not provided to the ECM.

INFOID:000000003856291

DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	
P1290	Throttle control motor relay circuit open (bank 2)	ECM detects a voltage of power source for	Harness or connectors (Throttle control motor relay circuit is open) Throttle control motor relay	
P2100	Throttle control motor relay circuit open (bank 1)	throttle control motor is excessively low.		
P2103	Throttle control motor relay circuit short	ECM detect the throttle control motor relay is stuck ON.	Harness or connectors (Throttle control motor relay circuit is shorted) Throttle control motor relay	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 8 V.

Which DTC is detected?

P1290, P2100>>GO TO 2.

P2103 >> GO TO 3.

2.PERFORM DTC CONFIRMATION PROCEDURE FOR DTC P1290 AND P2100

- 1. Turn ignition switch ON and wait at least 2 seconds.
- Start engine and let it idle for 5 seconds.
- Check DTC.

Is DTC detected?

YES >> Go to EC-395, "Diagnosis Procedure".

NO >> INSPECTION END

3.PERFORM DTC CONFIRMATION PROCEDURE FOR DTC P2103

- 1. Turn ignition switch ON and wait at least 1 second.
- Check DTC.

Is DTC detected?

YES >> Go to EC-395, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003856292

1. CHECK THROTTLE CONTROL MOTOR RELAY POWER SUPPLY CIRCUIT

- Turn ignition switch OFF.
- Disconnect ECM harness connector.

Revision: 2009 March **EC-395** 2009 FX35/FX50

EC

Α

_0

С

D

Е

F

Н

Κ

L

VI

Ν

 \circ

Р

P1290, P2100, P2103 THROTTLE CONTROL MOTOR RELAY

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

- 3. Disconnect IPDM E/R harness connector E7.
- 4. Check the continuity between IPDM E/R harness connector and ECM harness connector.

IPDM	E/R	EC	Continuity	
Connector	Terminal	Connector Terminal		Continuity
E7	70	F101	25	Existed

5. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E3, F1
- Harness connectors F104, F105
- Harness for open or short between ECM and IPDM E/R

>> Repair open circuit, short to ground or short to power in harness or connectors.

3. CHECK THROTTLE CONTROL MOTOR RELAY INPUT SIGNAL CIRCUIT

1. Check the continuity between IPDM E/R sensor harness connector and ECM harness connector.

DTC	IPDM	E/R	EC	Continuity		
DIC	Connector	Terminal	Connector	Terminal	Continuity	
P1290			F102	52		
P2100	E7		54	F101	3	Existed
P2103		54	F101	3	EXISTEC	
			F102	52		

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- · Harness connectors E3, F1
- Harness for open or short between ECM and IPDM E/R

>> Repair open circuit, short to ground or short to power in harness or connectors.

5. CHECK FUSE

- 1. Disconnect 15 A fuse (No. 51) from IPDM E/R.
- 2. Check 15 A fuse for blown.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace 15 A fuse.

6. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace IPDM E/R.

NO >> Repair or replace harness or connectors.

P1421 COLD START CONTROL

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

P1421 COLD START CONTROL

Description INFOID:0000000003856293

ECM controls ignition timing and engine idle speed when engine is started with pre-warming up condition. This control promotes the activation of three way catalyst by heating the catalyst and reduces emissions.

INFOID:0000000003856294

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P1421 is displayed with other DTC, first perform the trouble diagnosis for other DTC.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1421	Cold start emission reduction strategy monitoring	ECM does not control ignition timing and engine idle speed properly when engine is started with pre-warming up condition.	Lack of intake air volumeFuel injection systemECM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 11 V at idle.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

(P)With CONSULT-III

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Select "DATA MONITOR" mode with CONSULT-III.
- Check the indication of "COOLAN TEMP/S".

If it is between 4°C (39°F) and 36°C (97°F), go to the following steps.

If it is below 4°C (39°F), warm engine up to more than 4°C (39°F) and retry from step 1.

If it is above 36°C (97°F), cool engine down to less than 36°C (97°F) and retry from step 1.

- 5. Start engine and let it idle for 5 minutes.
- Check 1st trip DTC.

With GST

Follow the procedure "With CONSULT-III" above.

Is 1st trip DTC detected?

>> Go to EC-397, "Diagnosis Procedure". YES

NO >> INSPECTION END

INFOID:0000000003856295

Diagnosis Procedure

Perform EC-25, "IDLE AIR VOLUME LEARNING: Special Repair Requirement".

Is Idle Air Volume Learning carried out successfully?

1. PERFORM IDLE AIR VOLUME LEARNING

YES >> GO TO 2.

Revision: 2009 March

NO >> Follow the instruction of Idle Air Volume Learning.

2.CHECK INTAKE SYSTEM

EC-397

EC

Α

Е

F

Н

N

P1421 COLD START CONTROL

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Check for the cause of intake air volume lacking. Refer to the following.

- · Crushed intake air passage
- · Intake air passage clogging

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace malfunctioning part

3.check fuel injection system function

Perform DTC Confirmation Procedure for DTC P0171, P0174. Refer to EC-237, "DTC Logic".

Is the inspection result normal?

YES >> GO TO 4.

NO >> Go to EC-238, "Diagnosis Procedure" for DTC P0171, P0174.

4. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Turn ignition switch ON.
- 2. Erase DTC.
- 3. Perform DTC Confirmation Procedure. See EC-397, "DTC Logic".

Is the 1st trip DTC P1421 displayed again?

YES >> GO TO 5.

NO >> INSPECTION END

5. REPLACE ECM

- Replace ECM.
- Go to EC-23, "ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT: Special Repair Requirement".

>> INSPECTION END

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

P1550 BATTERY CURRENT SENSOR

Description INFOID:0000000003856296

The power generation voltage variable control enables fuel consumption to be decreased by reducing the engine load which is caused by the power generation of the generator. The battery current sensor is installed to the battery cable at the negative terminal. The sensor measures the charging/discharging current of the battery. Based on the sensor signal, ECM judges whether or not the power generation voltage variable control is performed. When performing the power generation voltage variable control, ECM calculates the target power generation voltage based on the sensor signal. And ECM sends the calculated value as the power generation command value to IPDM E/R. For the details of the power generation voltage variable control, refer to CHG-8. "System Description".

CAUTION:

Never connect the electrical component or the ground wire directly to the battery terminal. The connection causes the malfunction of the power generation voltage variable control, and then battery discharge may occur.

DTC Logic INFOID:0000000003856297

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1550	Battery current sensor circuit range/performance	The output voltage of the battery current sensor remains within the specified range while engine is running.	Harness or connectors (Battery current sensor circuit is open or shorted.) [Crankshaft position (CKP) sensor circuit is shorted.] [Camshaft position (CMP) sensor (bank 2) circuit is shorted.] [Exhaust valve timing (EVT) control position sensor (bank 2) circuit is shorted.] [Accelerator pedal position (APP) sensor 2 circuit is shorted.] (EVAP control system pressure sensor circuit is shorted.) (Refrigerant pressure sensor circuit is shorted.) Battery current sensor CKP sensor
			CMP sensor (bank 2) EVT control position sensor (bank 2) APP sensor EVAP control system pressure sensor Refrigerant pressure sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 8 V at idle.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine and wait at least 10 seconds.
- Check 1st trip DTC. 2.

EC-399 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Ν

Р

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Is 1st trip DTC detected?

YES >> Go to EC-400, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003856298

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- 2. Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2. CHECK BATTERY CURRENT SENSOR POWER SUPPLY CIRCUIT-I

- Disconnect battery current sensor harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between battery current sensor harness connector and ground.

Battery cur	rent sensor	Ground	Voltage (V)
Connector	Terminal	Giodila	voitage (v)
E21	1	Ground	Approx. 5

Is the inspection result normal?

YES >> GO TO 9. NO >> GO TO 3.

3. CHECK BATTERY CURRENT SENSOR POWER SUPPLY CIRCUIT-II

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check the continuity between battery current sensor harness connector and ECM harness connector.

Battery curr	ent sensor	EC	Continuity	
Connector	Terminal	Connector Terminal		
E21	1	F102	64	Existed

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F1, E3
- Harness for open between battery current sensor and ECM

>> Repair open circuit.

5. CHECK SENSOR POWER SUPPLY CIRCUIT

Check harness for short to power and short to ground, between the following terminals.

ECM		Sensor			
Connector	Terminal	Name	Connector	Terminal	
F101	46	Crankshaft position (CKP) sensor	F2	1	
		Camshaft position (CMP) sensor (bank 2)	F18	1	
F102 64	Exhaust valve timing (EVT) control position sensor (bank 2)	F19	1		
		Battery current sensor	E21	1	

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

EC	CM		Sensor				
Connector	Terminal	Nar	ne	Connector	Terminal		
	103	Accelerator position s	ensor (APP) sensor	E112 (Without ICC)	6		
M107	100	7 tooolorator poolitori c	oneer (711 1) dender	E116 (With ICC)	3		
	107	EVAP control system	pressure sensor	B252	3		
	111	Refrigerant pressure	sensor	E77	3		
		ult normal?					
	> GO TO (hart to navvar in	harnaga ar ag	nnootoro		
6.CHECK	•	hort to ground or s	nort to power in	namess of co	minectors.		
		NLIVIO					
Check theCKP sen		r to <u>EC-273, "Com</u>	oonent Inspectio	n".)			
• CMP ser	nsor (bank	2) (Refer to EC-2	79, "Component	Inspection".)		шХ	
		on sensor (bank 2) em pressure senso					
		re sensor (Refer to				·/	
Is the insp	ection resi	ult normal?					
	> GO TO 1						
NO >:	=	malfunctioning co	mponent.				
		omponent Inspection	<u>on"</u> .				
	> GO TO						
	> GO TO 8						
8.REPLA	CE ACCE	LERATOR PEDAL	ASSEMBLY				
1. Replac	ce acceler	ator pedal assemb	ly.				
		Special Repair Red					
	11.10555	TION 515					
\wedge		TION END	000 000	OID O! !!T = C =		D OLIODT	
		Y CURRENT SEN	SOR GROUND	CIRCUIT FOR	K OPEN AN	D SHOR I	
	gnition swi	tch OFF. I harness connecto	or.				
				or harness cor	nnector and	ECM harness connector.	
Battery cur	rent sensor	ECM	Continuity				
Connector	Terminal	Connector Termina					
E21	2	F102 95	Existed				
		ess for short to gro	und and short to	power.			
•		ult normal?					
	> GO TO ⁻ > GO TO ⁻						
		TU. FUNCTIONING PA	DT				
I U.DETE	CI WALF	ONCHONING PA	ΚI				

Check the following.

- Harness connectors F1, E3
- Harness for open or short between battery current sensor and ECM
 - >> Repair open circuit, short to ground or short to power in harness or connectors.

< DTC/CIRCUIT DIAGNOSIS >

11. CHECK BATTERY CURRENT SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

Check the continuity between battery current sensor harness connector and ECM harness connector.

Battery curr	ent sensor	EC	Continuity	
Connector	Connector Terminal		Terminal	Continuity
E21	3	F102	91	Existed

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 13.

>> GO TO 12. NO

12. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F1, E3
- Harness for open or short between battery current sensor and ECM

>> Repair open circuit, short to ground or short to power in harness or connectors.

13. CHECK BATTERY CURRENT SENSOR

Refer to EC-402, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 14.

>> Replace battery negative cable assembly.

14. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

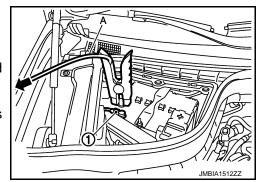
Component Inspection

INFOID:0000000003856299

1_{-} CHECK BATTERY CURRENT SENSOR

- Turn ignition switch OFF.
- Reconnect harness connectors disconnected.
- Disconnect battery negative cable (1).
 - : To body ground
- Install jumper cable (A) between battery negative terminal and body ground.
- Turn ignition switch ON.
- Check the voltage between ECM harness connector terminals under the following conditions.

	ECM					
Connector	+	_	Voltage (V)			
Connector	Terminal Termin					
F102	91 (Battery current sensor signal)	95	Approx. 2.5			



Before measuring the terminal voltage, confirm that the battery is fully charged. Refer to PG-3, "How to Handle Battery".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace battery negative cable assembly.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

P1551, P1552 BATTERY CURRENT SENSOR

Description INFOID:0000000004120383

The power generation voltage variable control enables fuel consumption to be decreased by reducing the engine load which is caused by the power generation of the generator. The battery current sensor is installed to the battery cable at the negative terminal. The sensor measures the charging/discharging current of the battery. Based on the sensor signal, ECM judges whether or not the power generation voltage variable control is performed. When performing the power generation voltage variable control, ECM calculates the target power generation voltage based on the sensor signal. And ECM sends the calculated value as the power generation command value to IPDM E/R. For the details of the power generation voltage variable control, refer to CHG-8. "System Description".

CAUTION:

Never connect the electrical component or the ground wire directly to the battery terminal. The connection causes the malfunction of the power generation voltage variable control, and then battery discharge may occur.

DTC Logic INFOID:0000000003856301

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1551	Battery current sensor circuit low input	An excessively low voltage from the sensor is sent to ECM.	Harness or connectors (Battery current sensor circuit is open
P1552	Battery current sensor circuit high input	An excessively high voltage from the sensor is sent to ECM.	or shorted.) [Crankshaft position (CKP) sensor circuit is shorted.] [Camshaft position (CMP) sensor (bank 2) circuit is shorted.] [Exhaust valve timing (EVT) control position sensor (bank 2) circuit is shorted.] [Accelerator pedal position (APP) sensor 2 circuit is shorted.] (EVAP control system pressure sensor circuit is shorted.) (Refrigerant pressure sensor circuit is shorted.) Battery current sensor CKP sensor CMP sensor (bank 2) EVT control position sensor (bank 2) APP sensor EVAP control system pressure sensor Refrigerant pressure sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 8 V with ignition switch ON

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

Turn ignition switch ON and wait at least 10 seconds.

EC-403 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Ν

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-404, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003856302

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.check battery current sensor power supply circuit-i

- 1. Disconnect battery current sensor harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between battery current sensor harness connector and ground.

Battery cur	rent sensor	Ground	Voltage (V)	
Connector	Terminal		voltage (v)	
E21	1	Ground	Approx. 5	

Is the inspection result normal?

YES >> GO TO 9.

NO >> GO TO 3.

3.CHECK BATTERY CURRENT SENSOR POWER SUPPLY CIRCUIT-II

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check the continuity between battery current sensor harness connector and ECM harness connector.

Battery curr	ent sensor	EC	Continuity	
Connector	Terminal	Connector Terminal		
E21	1	F102	64	Existed

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F1, E3
- Harness for open between battery current sensor and ECM

>> Repair open circuit.

5. CHECK SENSOR POWER SUPPLY CIRCUIT

Check harness for short to power and short to ground, between the following terminals.

ECM		Sensor		
Connector	Terminal	Name	Connector	Terminal
F101	46	Crankshaft position (CKP) sensor	F2	1

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

DTC/CIF	COII DI					
EC	CM		Sensor			-
Connector	Terminal		Name	Connector	Terminal	-
		Camshaft p	osition (CMP) sensor (bank 2)	F18	1	-
F102	64	Exhaust val	ve timing (EVT) control position k 2)	F19	1	-
		Battery curr	ent sensor	E21	1	-
	103	Accelerator	pedal position (APP) sensor	E112 (Without ICC)	6	-
M107				E116 (with ICC)	3	_
	107	EVAP contr	ol system pressure sensor	B252	3	_
	111	Refrigerant	pressure sensor	E77	3	_
о.снеск	СОМРО	•	und or short to power in h	narness or con	nectors.	
CKP sen			s, "Component Inspection o EC-279, "Component I			
					Inspection	")
EVT con EVAP co Refrigera	trol position entrol system ant pressu	on sensor (le em pressur re sensor (oank 2) (Refer to <u>EC-371</u> e sensor (Refer to <u>EC-31</u> Refer to <u>HAC-85, "Diagn</u>	, "Component 5, "Componer	t Inspectio	
EVT con EVAP co Refrigera s the insp	trol position trol system trol	on sensor (bem pressure re sensor (ult normal?	oank 2) (Refer to <u>EC-371</u> e sensor (Refer to <u>EC-31</u> Refer to <u>HAC-85, "Diagn</u>	, "Component 5, "Componer	t Inspectio	
EVT con EVAP co Refrigera s the insperies YES >:	trol position trol system on the system of t	on sensor (bem pressure re sensor (ult normal? 7.	oank 2) (Refer to <u>EC-371</u> e sensor (Refer to <u>EC-31</u> Refer to <u>HAC-85, "Diagn</u>	, "Component 5, "Componer	t Inspectio	
EVT con EVAP co Refrigera s the insp YES >: NO >:	trol position trol system on the system of t	on sensor (bem pressure re sensor (ult normal? 7. malfunctio	oank 2) (Refer to <u>EC-371</u> e sensor (Refer to <u>EC-31</u> Refer to <u>HAC-85, "Diagn</u>	, "Component 5, "Componer	t Inspectio	
EVT con EVAP co Refrigera s the insp YES >: NO >: CHECK	trol position professional pressuection resident res	on sensor (been pressure re sensor (ult normal? 7. malfunctio	oank 2) (Refer to <u>EC-371</u> e sensor (Refer to <u>EC-31</u> Refer to <u>HAC-85, "Diagn</u>	, "Component 5, "Componer	t Inspectio	
EVT con EVAP co Refrigera s the insp YES >: NO >: CHECK Refer to E s the insp	trol position pressurection results on the pressurection results of the pressure results of the press	on sensor (been pressure re sensor (ult normal? 7. malfunction NSOR omponent I ult normal?	pank 2) (Refer to <u>EC-371</u> e sensor (Refer to <u>EC-31</u> Refer to <u>HAC-85, "Diagn</u> ning component.	, "Component 5, "Componer	t Inspectio	
EVT con EVAP co Refrigera s the insp YES > NO > CHECK Refer to Eu s the insp YES >	trol position pressurection results of the control system of the c	on sensor (been pressure re sensor (ult normal? 7. malfunctio NSOR omponent I ult normal?	pank 2) (Refer to <u>EC-371</u> e sensor (Refer to <u>EC-31</u> Refer to <u>HAC-85, "Diagn</u> ning component.	, "Component 5, "Componer	t Inspectio	
EVT con EVAP co Refrigera s the insp YES >: NO >: CHECK Refer to E s the insp YES >: NO >:	trol position pressurection results of the pr	on sensor (been pressure re sensor (controller) 7. malfunction NSOR Component I controller 14. 8.	pank 2) (Refer to <u>EC-371</u> e sensor (Refer to <u>EC-31</u> Refer to <u>HAC-85</u> , " <u>Diagn</u> ning component.	, "Component 5, "Componer	t Inspectio	
EVT con EVAP co Refrigera s the insp YES > NO > CHECK Refer to E s the insp YES > NO > Refrigera	trol position pressurection results and pressurection results are results and pressurection results and pressurection results are results and pressurection results and results are results and results and results are results and results and results are results and results are results and results	on sensor (been pressure re sensor (cult normal?) 7. malfunction NSOR component I cult normal? 14. 8. LERATOR	pank 2) (Refer to <u>EC-371</u> e sensor (Refer to <u>EC-31</u> Refer to <u>HAC-85</u> , " <u>Diagn</u> ning component. PEDAL ASSEMBLY	, "Component 5, "Componer	t Inspectio	
EVT con EVAP co Refrigera s the insp YES > NO > CHECK Refer to E s the insp YES > NO > Refrigera	trol position pressurection results and pressurection results are results and pressurection results and pressurection results are results and results and results are results and results are results and results and results are results and results are results and results and results are results an	on sensor (been pressure re sensor (controller) 7. malfunction NSOR Component I component I component I component I controller) 14. component I controller LERATOR ator pedal	pank 2) (Refer to <u>EC-371</u> e sensor (Refer to <u>EC-31</u> Refer to <u>HAC-85</u> , " <u>Diagn</u> ning component. PEDAL ASSEMBLY	, "Component 5, "Componer	t Inspectio	
EVT con EVAP co Refrigera s the insp YES > NO > CHECK Refer to E s the insp YES > NO > REFLA REPLA Replac Go to	trol position pressurection results and pressurection results are results and pressurection results and pressurection results are results and results and results and results are results an	on sensor (been pressure re sensor (controller) 7. malfunction NSOR Component I component I component I component I controller) 14. component I controller LERATOR ator pedal	pank 2) (Refer to EC-371 e sensor (Refer to EC-31 Refer to HAC-85, "Diagn ning component. PEDAL ASSEMBLY assembly. pair Requirement".	, "Component 5, "Componer	t Inspectio	
EVT con EVAP co Refrigera s the insp YES > NO > CHECK Refer to E s the insp YES > NO > Refrigera CHECK Refer to E S the insp YES > NO > CHECK REPLA REPLA REPLA REPLA CHECK CHECK	trol position pressurection results and pressurection results are accelered	on sensor (been pressure re sensor (control of the	pank 2) (Refer to EC-371 e sensor (Refer to EC-31 Refer to HAC-85, "Diagn ning component. PEDAL ASSEMBLY assembly. pair Requirement".	, "Component 5, "Componer osis Procedure	at Inspection	<u>n"</u> .)
EVT con EVAP co Refrigera s the insp YES > NO > CHECK Refer to E(s the insp YES > NO > CHECK REPLA REPLA REPLA REPLA CHECK Turn iq Check	trol position prostrol system on the pressurent pressur	on sensor (been pressure re sensor (continued pressure re sensor pressure re sensor pressure re sensor pressure re sensor pressure re re sensor pressure re sensor pressure re sensor pressure re sensor pressure re sensor re sen	pank 2) (Refer to EC-371 e sensor (Refer to EC-31 Refer to HAC-85, "Diagn ring component. PEDAL ASSEMBLY assembly. pair Requirement".	. "Component 5, "Componer osis Procedure	OPEN ANI	<u>n"</u> .)
EVT con EVAP co Refrigera s the insp YES > NO > CHECK Refer to E s the insp YES > NO > REPLA REP	trol position prostrol system on the pressurent pressur	on sensor (been pressure re sensor (continued pressure re sensor pressure re sensor pressure re sensor pressure re sensor pressure re re sensor pressure re sensor pressure re sensor pressure re sensor pressure re sensor re sen	pank 2) (Refer to EC-371 e sensor (Refer to EC-31 Refer to HAC-85, "Diagn ning component. PEDAL ASSEMBLY assembly. pair Requirement". NT SENSOR GROUND Connector. en battery current senso	. "Component 5, "Componer osis Procedure	OPEN ANI	o".) O SHORT
EVT con EVAP co Refrigera s the insp YES > NO > CHECK Refer to E s the insp YES > NO > REPLA REP	trol position trol system on the pressure ection results and pressure ection results and pressure ection results and pressure ection results and pressure ection results are ection results and pressure ection ection switches are ection switches ection ect	on sensor (been pressure re sensor (continued or se	pank 2) (Refer to EC-371 e sensor (Refer to EC-31 Refer to HAC-85, "Diagn ming component. PEDAL ASSEMBLY assembly. pair Requirement". NT SENSOR GROUND Connector. en battery current senso	. "Component 5, "Componer osis Procedure	OPEN ANI	o".) O SHORT

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 11. NO >> GO TO 10.

10. DETECT MALFUNCTIONING PART

Check the following.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

- Harness connectors F1, E3
- Harness for open or short between battery current sensor and ECM

>> Repair open circuit, short to ground or short to power in harness or connectors.

11. CHECK BATTERY CURRENT SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between battery current sensor harness connector and ECM harness connector.

Battery curr	ent sensor	ECM		Continuity
Connector	Terminal	Connector Terminal		Continuity
E21	3	F102	91	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 13.

NO >> GO TO 12.

12. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F1, E3
- Harness for open or short between battery current sensor and ECM

>> Repair open circuit, short to ground or short to power in harness or connectors.

13. CHECK BATTERY CURRENT SENSOR

Refer to EC-406, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 14.

NO >> Replace battery negative cable assembly.

14. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000003856303

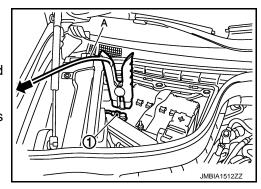
1. CHECK BATTERY CURRENT SENSOR

- Turn ignition switch OFF.
- 2. Reconnect harness connectors disconnected.
- 3. Disconnect battery negative cable (1).

To body ground

- 4. Install jumper cable (A) between battery negative terminal and body ground.
- 5. Turn ignition switch ON.
- 6. Check the voltage between ECM harness connector terminals under the following conditions.

Connector	+	_	Voltage (V)
Connector	Terminal	Terminal	
F102	F102 91 (Battery current sensor signal)		Approx. 2.5



Before measuring the terminal voltage, confirm that the battery is fully charged. Refer to PG-3, "How to Handle Battery".

< DTC/CIRCUIT DIAGNOSIS > [VQ35HR]

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace battery negative cable assembly.

EC

Α

С

D

Е

F

G

Н

1

J

Κ

L

M

Ν

0

Р

Description INFOID:000000004120385

The power generation voltage variable control enables fuel consumption to be decreased by reducing the engine load which is caused by the power generation of the generator. The battery current sensor is installed to the battery cable at the negative terminal. The sensor measures the charging/discharging current of the battery. Based on the sensor signal, ECM judges whether or not the power generation voltage variable control is performed. When performing the power generation voltage variable control, ECM calculates the target power generation voltage based on the sensor signal. And ECM sends the calculated value as the power generation command value to IPDM E/R. For the details of the power generation voltage variable control, refer to CHG-8, "System Description".

CAUTION:

Never connect the electrical component or the ground wire directly to the battery terminal. The connection causes the malfunction of the power generation voltage variable control, and then battery discharge may occur.

DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1553	Battery current sensor performance	The signal voltage transmitted from the sensor to ECM is higher than the amount of the maximum power generation.	Harness or connectors (Battery current sensor circuit is open or shorted.) [Crankshaft position (CKP) sensor circuit is shorted.] [Camshaft position (CMP) sensor (bank 2) circuit is shorted.] [Exhaust valve timing (EVT) control position sensor (bank 2) circuit is shorted.] [Accelerator pedal position (APP) sensor 2 circuit is shorted.] (EVAP control system pressure sensor circuit is shorted.) (Refrigerant pressure sensor circuit is shorted.) Battery current sensor CKP sensor CMP sensor (bank 2) EVT control position sensor (bank 2) APP sensor EVAP control system pressure sensor Refrigerant pressure sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 8 V at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine and wait at least 10 seconds.
- 2. Check 1st trip DTC.

Revision: 2009 March **EC-408** 2009 FX35/FX50

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Is 1st trip DTC detected?

YES >> Go to EC-409, "Diagnosis Procedure".

>> INSPECTION END NO

Diagnosis Procedure

INFOID:0000000003856306

1. CHECK GROUND CONNECTION

- Turn ignition switch OFF.
- 2. Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

>> GO TO 2. YES

NO >> Repair or replace ground connection.

2.CHECK BATTERY CURRENT SENSOR POWER SUPPLY CIRCUIT-I

- Disconnect battery current sensor harness connector.
- 2. Turn ignition switch ON.
- Check the voltage between battery current sensor harness connector and ground.

Battery cur	rent sensor	Ground	Voltage (V)
Connector	Connector Terminal		voltage (v)
E21	1	Ground	Approx. 5

Is the inspection result normal?

YES >> GO TO 9.

NO >> GO TO 3.

3.CHECK BATTERY CURRENT SENSOR POWER SUPPLY CIRCUIT-II

- Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check the continuity between battery current sensor harness connector and ECM harness connector.

Battery curr	ent sensor	ECM		Continuity
Connector	Terminal	Connector Terminal		Continuity
E21	1	F102	64	Existed

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

f 4.DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F1, E3
- Harness for open between battery current sensor and ECM

>> Repair open circuit.

5. CHECK SENSOR POWER SUPPLY CIRCUIT

Check harness for short to power and short to ground, between the following terminals.

ECM		Sensor			
Connector	Terminal	Name	Connector	Terminal	
F101	46	Crankshaft position (CKP) sensor	F2	1	
F102 64		Camshaft position (CMP) sensor (bank 2)	F18	1	
		Exhaust valve timing (EVT) control position sensor (bank 2)	F19	1	
		Battery current sensor	E21	1	

EC-409 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

F

Ν

Р

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

ECM		Sensor			
Connector	Terminal	Name	Connector	Terminal	
103		Accelerator pedal position (APP) sensor	E112 (Without ICC)	6	
M107	100	Accelerator pedal position (AFF) sensor	E116 (With ICC)	3	
	107 EVAP control system pressure sensor		B252	3	
	111	Refrigerant pressure sensor	E77	3	

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair short to ground or short to power in harness or connectors.

6. CHECK COMPONENTS

Check the following.

- CKP sensor (Refer to EC-273, "Component Inspection".)
- CMP sensor (bank 2) (Refer to EC-279, "Component Inspection".)
- EVT position sensor (bank 2) (Refer to <u>EC-371, "Component Inspection"</u>.)
- EVAP control system pressure sensor (Refer to EC-315, "Component Inspection".)
- Refrigerant pressure sensor (Refer to <u>HAC-85</u>, "<u>Diagnosis Procedure</u>".)

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace malfunctioning component.

7. CHECK APP SENSOR

Refer to EC-446, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 14. NO >> GO TO 8.

8.replace accelerator pedal assembly

- Replace accelerator pedal assembly.
- 2. Go to EC-447, "Special Repair Requirement".

>> INSPECTION END

9.check battery current sensor ground circuit for open and short

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check the continuity between battery current sensor harness connector and ECM harness connector.

Battery curr	ent sensor	EC	Continuity	
Connector	Terminal	Connector Terminal		Continuity
E21	2	F102	95	Existed

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 11.

NO >> GO TO 10.

10.DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F1, E3
- Harness for open or short between battery current sensor and ECM
 - >> Repair open circuit, short to ground or short to power in harness or connectors.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

11. CHECK BATTERY CURRENT SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

Check the continuity between battery current sensor harness connector and ECM harness connector.

Battery curr	ent sensor	EC	Continuity	
Connector	Terminal	Connector	Terminal	Continuity
E21	3	F102	91	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

>> GO TO 13. YES

NO >> GO TO 12.

12. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F1, E3
- Harness for open or short between battery current sensor and ECM

>> Repair open circuit, short to ground or short to power in harness or connectors.

13. CHECK BATTERY CURRENT SENSOR

Refer to EC-411, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 14.

>> Replace battery negative cable assembly.

14. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

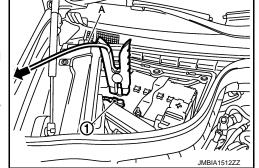
>> INSPECTION END

Component Inspection

1. CHECK BATTERY CURRENT SENSOR

- Turn ignition switch OFF.
- 2. Reconnect harness connectors disconnected.
- Disconnect battery negative cable (1).
 - To body ground
- Install jumper cable (A) between battery negative terminal and body ground.
- Turn ignition switch ON.
- Check the voltage between ECM harness connector terminals as follows.

Connector	+	_	Voltage (V)
Connector	Terminal	Terminal	
F102	91 (Battery current sensor signal)	95	Approx. 2.5



Before measuring the terminal voltage, confirm that the battery is fully charged. Refer to PG-3, "How to Handle Battery".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace battery negative cable assembly.

EC-411 Revision: 2009 March 2009 FX35/FX50

EC

Α

Н

INFOID:0000000003856307

K

M

Ν

Р

Description INFOID:0000000004120386

The power generation voltage variable control enables fuel consumption to be decreased by reducing the engine load which is caused by the power generation of the generator. The battery current sensor is installed to the battery cable at the negative terminal. The sensor measures the charging/discharging current of the battery. Based on the sensor signal, ECM judges whether or not the power generation voltage variable control is performed. When performing the power generation voltage variable control, ECM calculates the target power generation voltage based on the sensor signal. And ECM sends the calculated value as the power generation command value to IPDM E/R. For the details of the power generation voltage variable control, refer to CHG-8, "System Description".

CAUTION:

Never connect the electrical component or the ground wire directly to the battery terminal. The connection causes the malfunction of the power generation voltage variable control, and then battery discharge may occur.

DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1554	Battery current sensor performance	The output voltage of the battery current sensor is lower than the specified value while the battery voltage is high enough.	Harness or connectors (Battery current sensor circuit is open or shorted.) [Crankshaft position (CKP) sensor circuit is shorted.] [Camshaft position (CMP) sensor (bank 2) circuit is shorted.] Exhaust valve timing (EVT) control position sensor (bank 2) circuit is shorted.] [Accelerator pedal position (APP) sensor 2 circuit is shorted.] (EVAP control system pressure sensor circuit is shorted.) (Refrigerant pressure sensor circuit is shorted.) Battery current sensor CKP sensor CMP sensor (bank 2) EVT control position sensor (bank 2) APP sensor EVAP control system pressure sensor Refrigerant pressure sensor

DTC CONFIRMATION PROCEDURE

1. PERFORM COMPONENT FUNCTION CHECK

Perform component function check. Refer to EC-412, "Component Function Check".

NOTE:

Use component function check to check the overall function of the battery current sensor circuit. During this check, a 1st trip DTC might not be confirmed.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-413, "Diagnosis Procedure".

Component Function Check

INFOID:0000000003856310

1.PRECONDITIONING

TESTING CONDITION:

• Before performing the following procedure, confirm that battery voltage is more than 12.8 V at idle.

Revision: 2009 March EC-412 2009 FX35/FX50

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

 Before performing the following procedure, confirm that all load switches and A/C switch are turned OFF.

>> GO TO 2.

2.PERFORM COMPONENT FUNCTION CHECK

EC

D

Е

Н

K

N

Р

Α

(P)With CONSULT-III

- 1. Start engine and let it idle.
- 2. Select "BAT CUR SEN" in "DATA MONITOR" mode with CONSULT-III.
- 3. Check "BAT CUR SEN" indication for 10 seconds.

"BAT CUR SEN" should be above 2,300 mV at least once.

Without CONSULT-III

- 1. Start engine and let it idle.
- Check the voltage between ECM harness connector terminals as follows.

	ECM		
Connector	+	-	Voltage (V)
Connector	Terminal	Terminal	
F102	91 (Battery current sensor signal)	95	Above 2.3 at least once

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-413, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003856311

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.check battery current sensor power supply circuit-i

- Disconnect battery current sensor harness connector.
- Turn ignition switch ON.
- 3. Check the voltage between battery current sensor harness connector and ground.

Battery cur	rent sensor	Ground	Voltage (V)	
Connector	Terminal		voltage (v)	
E21	1	Ground	Approx. 5	

Is the inspection result normal?

YES >> GO TO 9.

NO >> GO TO 3.

${f 3.}$ CHECK BATTERY CURRENT SENSOR POWER SUPPLY CIRCUIT-II

- Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check the continuity between battery current sensor harness connector and ECM harness connector.

Battery current sensor		ECM		Continuity	
Connector	Terminal	Connector Terminal		Continuity	
E21	1	F102	64	Existed	

Is the inspection result normal?

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

YES >> GO TO 5. NO >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F1, E3
- Harness for open between battery current sensor and ECM

>> Repair open circuit.

${f 5.}$ CHECK SENSOR POWER SUPPLY CIRCUIT

Check harness for short to power and short to ground, between the following terminals.

ECM		Sensor			
Connector	Terminal	Name	Connector	Terminal	
F101	46	Crankshaft position (CKP) sensor	F2	1	
		Camshaft position (CMP) sensor (bank 2)	F18	1	
F102 64	64	Exhaust valve timing (EVT) control position sensor (bank 2)	F19	1	
		Battery current sensor	E21	1	
	103 Accelerator pedal position (102 Appelarator padal position (APP) consor	E112 (Without ICC)	6	
M107		Accelerator pedal position (AFF) sensor	E116 (With ICC)	3	
	107	EVAP control system pressure sensor	B252	3	
	111	Refrigerant pressure sensor	E77	3	

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair short to ground or short to power in harness or connectors.

6.CHECK COMPONENTS

Check the following.

- CKP sensor (Refer to <u>EC-273, "Component Inspection"</u>.)
 CMP sensor (bank 2) (Refer to <u>EC-279, "Component Inspection"</u>.)
- EVT control position sensor (bank 2) (Refer to EC-371, "Component Inspection".)
- EVAP control system pressure sensor (Refer to EC-315, "Component Inspection".)
- Refrigerant pressure sensor (Refer to <u>HAC-85</u>, "<u>Diagnosis Procedure</u>".)

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace malfunctioning component.

7. CHECK APP SENSOR

Refer to EC-446, "Component Inspection".

Is the inspection result normal?

>> GO TO 14. YFS

NO >> GO TO 8.

8.REPLACE ACCELERATOR PEDAL ASSEMBLY

- Replace accelerator pedal assembly.
- Go to EC-447, "Special Repair Requirement".

>> INSPECTION END

9.CHECK BATTERY CURRENT SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

Turn ignition switch OFF.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

- 2. Disconnect ECM harness connector.
- 3. Check the continuity between battery current sensor harness connector and ECM harness connector.

Battery curr	ent sensor	EC	Continuity	
Connector	Terminal	Connector Terminal		Continuity
E21	2	F102	95	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 11. NO >> GO TO 10.

10. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F1, E3
- Harness for open or short between battery current sensor and ECM

>> Repair open circuit, short to ground or short to power in harness or connectors.

11. CHECK BATTERY CURRENT SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between battery current sensor harness connector and ECM harness connector.

	Battery current sensor		ECM		Continuity	
-	Connector	Terminal	Connector Terminal		Continuity	
	E21	3	F102	91	Existed	

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 13. NO >> GO TO 12.

12. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F1, E3
- Harness for open or short between battery current sensor and ECM

>> Repair open circuit, short to ground or short to power in harness or connectors.

13. CHECK BATTERY CURRENT SENSOR

Refer to EC-415, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 14.

NO >> Replace battery negative cable assembly.

14. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

1. CHECK BATTERY CURRENT SENSOR

Component Inspection

- 1. Turn ignition switch OFF.
- 2. Reconnect harness connectors disconnected.

EC

Α

D

Е

Н

1

J

K

M

Ν

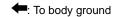
0

INFOID:0000000003856312

< DTC/CIRCUIT DIAGNOSIS >

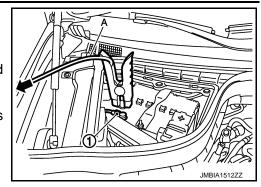
[VQ35HR]

3. Disconnect battery negative cable (1).



- 4. Install jumper cable (A) between battery negative terminal and body ground.
- 5. Turn ignition switch ON.
- 6. Check the voltage between ECM harness connector terminals under the following conditions.

Connector	+	-	Voltage (V)	
Connector	Terminal Terminal			
F102	91 (Battery current sensor signal)	95	Approx. 2.5	



Before measuring the terminal voltage, confirm that the battery is fully charged. Refer to PG-3, "How to Handle Battery".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace battery negative cable assembly.

P1564 ASCD STEERING SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

P1564 ASCD STEERING SWITCH

Description INFOID:0000000003856313

ASCD steering switch has variant values of electrical resistance for each button. ECM reads voltage variation of switch, and determines which button is operated.

Refer to EC-66, "System Description" for the ASCD function.

DTC Logic INFOID:0000000003856314

DTC DETECTION LOGIC

NOTE:

If DTC P1564 is displayed with DTC P0605, first perform the trouble diagnosis for DTC P0605. Refer to EC-358, "DTC Logic".

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1564	ASCD steering switch	 An excessively high voltage signal from the ASCD steering switch is sent to ECM. ECM detects that input signal from the ASCD steering switch is out of the specified range. ECM detects that the ASCD steering switch is stuck ON. 	Harness or connectors (The switch circuit is open or shorted.) ASCD steering switch ECM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.perform dtc confirmation procedure

- Turn ignition switch ON and wait at least 10 seconds.
- Press MAIN switch for at least 10 seconds, then release it and wait at least 10 seconds.
- Press CANCEL switch for at least 10 seconds, then release it and wait at least 10 seconds.
- Press RESUME/ACCELERATE switch for at least 10 seconds, then release it and wait at least 10 seconds
- 5. Press SET/COAST switch for at least 10 seconds, then release it and wait at least 10 seconds.
- Check DTC.

Is DTC detected?

YES >> Go to EC-417, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

CHECK GROUND CONNECTION

- Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

>> GO TO 2. YES

NO >> Repair or replace ground connection.

2.CHECK ASCD STEERING SWITCH CIRCUIT

(P) With CONSULT-III

EC-417 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

Н

K

N

INFOID:0000000003856315

Р

P1564 ASCD STEERING SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

- 1. Turn ignition switch ON.
- Select "MAIN SW", "CANCEL SW", "RESUME/ACC SW" and "SET SW" in "DATA MONITOR" mode with CONSULT-III.
- 3. Check each item indication under the following conditions.

Monitor item	Condition		Indication
MAIN SW	MAIN switch	Pressed	ON
MAIN SW	WAIN SWILCH	Released	OFF
CANCEL SW	CANCEL switch	Pressed	ON
CANCLL SW	CANCLE SWILLI	Released	OFF
RESUME/ACC SW	RESUME/ACCEL-	Pressed	ON
RESUME/ACC SW	ERATE switch	Released	OFF
SFT SW	SET/COAST switch	Pressed	ON
3L1 3W	3L1/COA31 SWIICH	Released	OFF

⋈ Without CONSULT-III

- 1. Turn ignition switch ON.
- 2. Check the voltage between ECM harness connector terminals under the following conditions.

ECM				
Connector	+	_	Condition	Voltage (V)
Connector	Terminal	Terminal		
			MAIN switch: Pressed	Approx. 0
	101 (ASCD steering switch signal)	108	CANCEL switch: Pressed	Approx. 1
M107			SET/COAST switch: Pressed	Approx. 2
			RESUME/ACCELERATE switch: Pressed	Approx. 3
			All ASCD steering switches: Released	Approx. 4

Is the inspection result normal?

YES >> GO TO 8. NO >> GO TO 3.

3.check ascd steering switch ground circuit for open and short

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Disconnect combination switch harness connector M303.
- 4. Check the continuity between combination switch and ECM harness connector.

Combination switch		EC	CM	Continuity
Connector	Terminal	Connector	Terminal	Continuity
M303	16	M107	108	Existed

5. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5. NO >> GO TO 4.

4.DETECT MALFUNCTIONING PART

Check the following.

- Combination switch (spiral cable)
- · Harness for open and short between ECM and combination switch
 - >> Repair open circuit, short to ground or short to power in harness or connectors.

P1564 ASCD STEERING SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

${f 5.}$ CHECK ASCD STEERING SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

Check the continuity between combination switch and ECM harness connector.

Combination switch		ECM		Continuity	
Connector	Terminal	Connector Terminal		Continuity	
M303	13	M107	101	Existed	

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 6.

$\mathsf{6}.\mathsf{DETECT}$ MALFUNCTIONING PART

Check the following.

- Combination switch (spiral cable)
- Harness for open and short between ECM and combination switch

>> Repair open circuit, short to ground or short to power in harness or connectors.

7.CHECK ASCD STEERING SWITCH

Refer to EC-419, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 8.

NO >> Replace ASCD steering switch.

8.CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000003856316

CHECK ASCD STEERING SWITCH

- Turn ignition switch OFF.
- 2. Disconnect combination switch (spiral cable) harness connector.
- Check resistance between combination switch harness connector terminals under the following conditions.

Combination switch		Condition	Resistance (Ω)	
Connector	Terminals	Condition	116313ta1106 (12)	
	MAIN switch: Pressed		Approx. 0	
	13 and 16	CANCEL switch: Pressed	Approx. 250	
M303		SET/COAST switch: Pressed	Approx. 660	
		RESUME/ACCELERATE switch: Pressed	Approx. 1,490	
		All ASCD steering switches: Released	Approx. 3,980	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace ASCD steering switch

EC-419 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

F

Н

K

L

M

Ν

Р

P1564 ICC STEERING SWITCH

Description INFOID:000000003856317

ICC steering switch has variant values of electrical resistance for each button. ECM reads voltage variation of switch, and determines which button is operated.

Refer to CCS-24, "System Description" for the ICC function.

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P1564 is displayed with DTC P0605, first perform the trouble diagnosis for DTC P0605. Refer to EC-358, "DTC Logic".

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1564	ICC steering switch	 An excessively high voltage signal from the ICC steering switch is sent to ECM. ECM detects that input signal from the ICC steering switch is out of the specified range. ECM detects that the ICC steering switch is stuck ON. 	_

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.perform dtc confirmation procedure

- 1. Turn ignition switch ON and wait at least 10 seconds.
- 2. Press MAIN switch for at least 10 seconds, then release it and wait at least 10 seconds.
- 3. Press CANCEL switch for at least 10 seconds, then release it and wait at least 10 seconds.
- Press RESUME/ACCELERATE switch for at least 10 seconds, then release it and wait at least 10 seconds.
- 5. Press SET/COAST switch for at least 10 seconds, then release it and wait at least 10 seconds.
- Press DISTANCE switch for at least 10 seconds, then release it and wait at least 10 seconds.
- 7. Press LDP switch for at least 10 seconds, then release it at wait at least 10 seconds.
- 8. Check DTC.

Is DTC detected?

YES >> Go to EC-420, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003856319

1. CHECK GROUND CONNECTION

- Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.check icc steering switch circuit

P1564 ICC STEERING SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Turn ignition switch ON.

Check the voltage between ECM harness connector terminals under the following conditions.

	ECM			
Connector	+	_	Condition	Voltage (V)
Connector	Terminal	Terminal		
	101 (ICC steering switch signal)		MAIN switch: Pressed	Approx. 0
		108	LDP switch: Pressed	Approx. 1.0
			CANCEL switch: Pressed	Approx. 1.9
M107			DISTANCE switch: Pressed	Approx. 2.6
	(coo electivity electronic electronic)		SET/COAST switch: Pressed	Approx. 3.2
			RESUME/ACCELERATE switch: Pressed	Approx. 3.7
			All ICC steering switches: Released	Approx. 4.2

Is the inspection result normal?

YES >> GO TO 8.

NO >> GO TO 3.

${f 3.}$ CHECK ICC STEERING SWITCH GROUND CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- Disconnect ECM harness connector. 2.
- Disconnect combination switch harness connector M303.
- Check the continuity between combination switch and ECM harness connector.

Combinat	EC	Continuity		
Connector Terminal		Connector	Terminal	Continuity
M303	16	M107	108	Existed

Also check harness for short to ground and short to power.

Is the inspection result normal?

>> GO TO 5. YES NO >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Combination switch (spiral cable)
- Harness for open and short between ECM and combination switch

>> Repair open circuit, short to ground or short to power in harness or connectors.

${f 5.}$ CHECK ICC STEERING SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

Check the continuity between combination switch and ECM harness connector.

Combinat	tion switch	EC	Continuity	
Connector Terminal		Connector	Terminal	Continuity
M303	13	M107	101	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6.

6.DETECT MALFUNCTIONING PART

Check the following.

Revision: 2009 March

Combination switch (spiral cable)

EC-421 2009 FX35/FX50 EC

Α

D

Е

F

Н

K

M

Ν

P1564 ICC STEERING SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

· Harness for open and short between ECM and combination switch

>> Repair open circuit, short to ground or short to power in harness or connectors.

7. CHECK ICC STEERING SWITCH

Refer to EC-422, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 8.

NO >> Replace ICC steering switch.

8. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000003856320

1. CHECK ICC STEERING SWITCH

- 1. Turn ignition switch OFF.
- 2. Disconnect combination switch (spiral cable) harness connector.
- Check resistance between combination switch harness connector terminals under the following conditions.

Combination switch		Condition	Resistance (Ω)	
Connector	Terminals	Condition	116313141106 (122)	
		MAIN switch: Pressed	Approx. 0	
	13 and 16	LDP switch: Pressed	Approx. 270	
		CANCEL switch: Pressed	Approx. 620	
M303		DISTANCE switch: Pressed	Approx. 1,100	
		SET/COAST switch: Pressed	Approx. 1,810	
		RESUME/ACCELERATE switch: Pressed	Approx. 2,990	
		All ICC steering switches: Released	Approx. 5,420	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace ICC steering switch

P1568 ICC FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

P1568 ICC FUNCTION

DTC Logic INFOID:0000000003856321

DTC DETECTION LOGIC

NOTE:

- If DTC P1568 is displayed with DTC UXXXX, first perform the trouble diagnosis for DTC UXXXX.
- If DTC P1568 is displayed with DTC P0605, first perform the trouble diagnosis for DTC P0605. Refer to EC-358, "DTC Logic".
- If DTC P1568 is displayed with DTC P0607, first perform the trouble diagnosis for DTC P0607. Refer to EC-360, "DTC Logic".

DTC No.	Trouble Diagnosis Name	DTC Detecting Condition	Possible Cause
P1568	ICC function	ECM detects a difference between signals from ICC sensor integrated unit is out of specified range.	Harness or connectors (The CAN communication line is open or shorted.) ICC sensor integrated unit ECM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Step 2 may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- Turn ignition switch ON.
- 2. Press MAIN switch on ICC steering switch.
- 3. Drive the vehicle at more than 40 km/h (25 MPH).

CAUTION:

Always drive vehicle at a safe speed.

- Press SET/COAST switch.
- 5. Check DTC.

Is DTC detected?

YES >> Go to EC-423, "Diagnosis Procedure".

>> INSPECTION END NO

Diagnosis Procedure

1. REPLACE ICC SENSOR INTEGRATED UNIT

- Replace ICC sensor integrated unit.
- 2. Perform CCS-18, "ACTION TEST: Special Repair Requirement (Vehicle-To-Vehicle Distance Control
- Check DTC of ICC sensor integrated unit. Refer to CCS-44, "Diagnosis Description".

>> INSPECTION END

EC

Α

D

F

Е

Н

N

INFOID:0000000003856322

Р

EC-423 Revision: 2009 March 2009 FX35/FX50

[VQ35HR]

P1572 ASCD BRAKE SWITCH

Description INFOID.000000003856323

When the brake pedal is depressed, ASCD brake switch is turned OFF and stop lamp switch is turned ON. ECM detects the state of the brake pedal by those two types of input (ON/OFF signal). Refer to EC-66, "System Description" for the ASCD function.

DTC Logic

DTC DETECTION LOGIC

NOTE:

- If DTC P1572 is displayed with DTC P0605, first perform the trouble diagnosis for DTC P0605. Refer to EC-358, "DTC Logic".
- This self-diagnosis has the one trip detection logic. When malfunction A is detected, DTC is not stored in ECM memory. And in that case, 1st trip DTC and 1st trip freeze frame data are displayed.
 1st trip DTC is erased when ignition switch is turned OFF. And even when malfunction A is detected in two consecutive trips, DTC is not stored in ECM memory.

DTC No.	Trouble diagnosis name	DTC detecting condition		Possible cause
		A)	When the vehicle speed is above 30 km/h (19 MPH), ON signals from the stop lamp switch and the ASCD brake switch are sent to the ECM at the same time.	Harness or connectors (The stop lamp switch circuit is shorted.) Harness or connectors (The ASCD brake switch circuit is shorted.)
P1572	ASCD brake switch	В)	ASCD brake switch signal is not sent to ECM for extremely long time while the vehicle is being driven.	Stop lamp switch ASCD brake switch Incorrect stop lamp switch installation Incorrect ASCD brake switch installation ECM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

NOTE:

The procedure for malfunction B is not described. It takes an extremely long time to complete the procedure for malfunction B. By performing the procedure for malfunction A, the condition that causes malfunction B can be detected.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE-I

(P)With CONSULT-III

- Start engine (VDC switch OFF).
- Select "DATA MONITOR" mode with CONSULT-III.
- 3. Press MAIN switch and make sure that CRUISE lamp illuminates.
- 4. Drive the vehicle for at least 5 consecutive seconds under the following conditions.

CAUTION:

Always drive vehicle at a safe speed.

NOTÉ:

This procedure may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

VHCL SPEED SE	More than 30 km/h (19 mph)
Selector lever	Suitable position

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Check 1st trip DTC.

With GST

Follow the procedure "With CONSULT-III" above.

Is 1st trip DTC detected?

YES >> Go to EC-425, "Diagnosis Procedure".

NO >> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE-II

(P)With CONSULT-III

1. Drive the vehicle for at least 5 consecutive seconds under the following conditions.

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

This procedure may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

VHCL SPEED SE	More than 30 km/h (19 mph)
Selector lever	Suitable position
Driving location	Depress the brake pedal for more than 5 seconds so as not to come off from the above-mentioned vehicle speed.

Check 1st trip DTC.

With GST

Follow the procedure "With CONSULT-III" above.

Is 1st trip DTC detected?

YES >> Go to EC-425, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1. CHECK OVERALL FUNCTION-I

(P) With CONSULT-III

- Turn ignition switch ON.
- Select "BRAKE SW1" in "DATA MONITOR" mode with CONSULT-III.
- Check "BRAKE SW1" indication under the following conditions.

Monitor item	Condition	Indication	
BRAKE SW1	Brake pedal	Slightly depressed	OFF
DIVARL SWI	Brake pedar	Fully released	ON

Without CONSULT-III

- Turn ignition switch ON.
- Check the voltage between ECM harness connector terminals as follows.

	ECM					
Connector	+	_	Condition		Voltage (V)	
Connector	Terminal	Terminal				
M107	126	128	Brake pedal	Slightly depressed	Approx. 0	
IVI I U 7	(ASCD brake switch signal)		Diake pedal	Fully released	Battery voltage	

Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 3.

2.CHECK OVERALL FUNCTION-II

EC-425 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

F

INFOID:0000000003856325

Ν

Р

< DTC/CIRCUIT DIAGNOSIS >

(P) With CONSULT-III

Select "BRAKE SW2" and check indication under the following conditions.

Monitor item	Condition		Indication
BRAKE SW2	Brake pedal	Slightly depressed	ON
DIVAIL OWZ	Diake pedal	Fully released	OFF

⋈ Without CONSULT-III

Check the voltage between ECM harness connector terminals under the following conditions.

ECM					
Connector	+	_	C	Condition	Voltage (V)
Terminal Terminal		Terminal]		
M107	122	128	Brake pedal	Slightly depressed	Battery voltage
IVI TO 7	(Stop lamp switch signal)	120	Diake pedal	Fully released	Approx. 0

Is the inspection result normal?

YES >> GO TO 13.

NO >> GO TO 8.

${f 3.}$ CHECK ASCD BRAKE SWITCH POWER SUPPLY CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect ASCD brake switch harness connector.
- 3. Turn ignition switch ON.
- 4. Check the voltage between ASCD brake switch harness connector and ground.

ASCD brake switch		Ground	Voltage
Connector	Terminal	Ciodila	Voltage
E109	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 5. NO >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E103
- 10 A fuse (No. 3)
- Harness for open or short between ASCD brake switch and fuse

>> Repair open circuit, short to ground or short to power in harness or connectors.

$5. \mathsf{CHECK}$ ASCD BRAKE SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check the continuity between ASCD brake switch harness connector and ECM harness connector.

•	ASCD brake switch		ECM		Continuity
	Connector	Terminal	Connector	Terminal	Continuity
	E109	2	M107	126	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E106, M6
- Harness for open or short between ECM and ASCD brake switch

EC

>> Repair open circuit, short to ground or short to power in harness or connectors.

7 . CHECK ASCD BRAKE SWITCH

Refer to EC-428, "Component Inspection (ASCD Brake Switch)"

Is the inspection result normal?

YES >> GO TO 13.

NO >> Replace ASCD brake switch.

8.CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT

- Turn ignition switch OFF.
- Disconnect stop lamp switch harness connector.
- Check the voltage between stop lamp switch harness connector and ground.

Stop lamp switch		Ground	Voltage
Connector Terminal		Giodila	voltage
E110	3	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 10.

NO >> GO TO 9.

9. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E103
- 10 A fuse (No. 7)
- Harness for open or short between stop lamp switch and battery

>> Repair open circuit, short to ground or short to power in harness or connectors.

10.CHECK STOP LAMP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Disconnect ECM harness connector.
- 2. Check the continuity between stop lamp switch harness connector and ECM harness connector.

Stop lamp switch		ECM		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E110	4	M107	122	Existed

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 12.

NO >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connectors E103, M2
- Harness for open or short between ECM and stop lamp switch

>> Repair open circuit, short to ground or short to power in harness or connectors.

12. CHECK STOP LAMP SWITCH

Refer to EC-428, "Component Inspection (Stop Lamp Switch)".

EC-427 Revision: 2009 March 2009 FX35/FX50

D

Е

L

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?
YES >> GO TO 13.

NO >> Replace stop lamp switch.

13. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection (ASCD Brake Switch)

INFOID:0000000003856326

[VQ35HR]

1 - CHECK ASCD BRAKE SWITCH-I

- 1. Turn ignition switch OFF.
- 2. Disconnect ASCD brake switch harness connector.
- Check the continuity between ASCD brake switch terminals under the following conditions.

Terminals	Condition		Continuity
1 and 2	Brake pedal	Fully released	Existed
i anu z	brake pedar	Slightly depressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2. CHECK ASCD BRAKE SWITCH-II

- Adjust ASCD brake switch installation. Refer to <u>BR-19</u>, "Inspection and Adjustment".
- 2. Check the continuity between ASCD brake switch terminals under the following conditions.

Terminals	Condition		Continuity
1 and 2	Brake pedal	Fully released	Existed
i and 2	brake pedar	Slightly depressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace ASCD brake switch.

Component Inspection (Stop Lamp Switch)

INFOID:0000000003856327

1. CHECK STOP LAMP SWITCH-I

- 1. Turn ignition switch OFF.
- 2. Disconnect stop lamp switch harness connector.
- 3. Check the continuity between stop lamp switch terminals under the following conditions.

Terminals	Condition		Continuity
3 and 4	Brake pedal	Fully released	Not existed
J and 4	Drake pedar	Slightly depressed	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.CHECK STOP LAMP SWITCH-II

- 1. Adjust stop lamp switch installation. Refer to BR-19, "Inspection and Adjustment".
- 2. Check the continuity between stop lamp switch terminals under the following conditions.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Terminals	Condition		Continuity
3 and 4	Brake pedal	Fully released	Not existed
3 and 4	Diake pedai	Slightly depressed	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace stop lamp switch.

EC

Α

D

С

Е

F

G

Н

J

Κ

L

M

Ν

0

Ρ

P1572 ICC BRAKE SWITCH

Description INFOID.000000003856328

When the brake pedal is depressed, ICC brake switch is turned OFF and stop lamp switch is turned ON. ECM detects the state of the brake pedal by those two types of input (ON/OFF signal). Refer to CCS-24, "System Description" for the ICC function.

DTC Logic

DTC DETECTION LOGIC

NOTE:

- If DTC P1572 is displayed with DTC P0605, first perform the trouble diagnosis for DTC P0605. Refer to EC-358, "DTC Logic".
- This self-diagnosis has the one trip detection logic. When malfunction A is detected, DTC is not stored in ECM memory. And in that case, 1st trip DTC and 1st trip freeze frame data are displayed.
 1st trip DTC is erased when ignition switch is turned OFF. And even when malfunction A is detected in two consecutive trips, DTC is not stored in ECM memory.

DTC No.	Trouble diagnosis name		DTC detecting condition	Possible cause
		A)	ON signals from the stop lamp switch and the ICC brake switch are sent to ECM at the same time.	Harness or connectors (The stop lamp switch circuit is shorted.) Harness or connectors
P1572	ICC brake switch	В)	ICC brake switch signal is not sent to ECM for extremely long time while the vehicle is being driven	 (The ICC brake switch circuit is shorted.) Stop lamp switch ICC brake switch ICC brake hold relay Incorrect stop lamp switch installation Incorrect ICC brake switch installation ECM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

NOTE:

The procedure for malfunction B is not described. It takes an extremely long time to complete the procedure for malfunction B. By performing the procedure for malfunction A, the condition that causes malfunction B can be detected.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE-I

- 1. Start engine (VDC switch OFF).
- 2. Press MAIN switch and make sure that CRUISE lamp illuminates.
- Drive the vehicle for at least 5 consecutive seconds under the following conditions.

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

This procedure may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

VHCL SPEED SE	More than 30 km/h (19 mph)
Selector lever	Suitable position

4. Check 1st trip DTC.

P1572 ICC BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Is 1st trip DTC detected?

YES >> Go to EC-431, "Diagnosis Procedure".

NO >> GO TO 3.

3. PERFORM DTC CONFIRMATION PROCEDURE-II

Drive the vehicle for at least 5 consecutive seconds under the following conditions. **CAUTION:**

EC

Α

Always drive vehicle at a safe speed.

NOTE:

This procedure may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

VHCL SPEED SE	More than 30 km/h (19 mph)
Selector lever	Suitable position
Driving location	Depress the brake pedal for more than 5 seconds so as not to come off from the above-mentioned vehicle speed.

Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-431, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003856330

1. CHECK OVERALL FUNCTION-I

(II) With CONSULT-III

- Turn ignition switch ON.
- Select "BRAKE SW1" in "DATA MONITOR" mode with CONSULT-III.
- Check "BRAKE SW1" indication under the following conditions.

Monitor item	Condition	Indication	
BRAKE SW1	Brake pedal	Slightly depressed	OFF
DIVARE OWI	Brake pedal	Fully released	ON

Without CONSULT-III

- Turn ignition switch ON.
- Check the voltage between ECM harness connector terminals under the following conditions.

ECM					
Connector	+	_	Condition		Voltage (V)
Connector	Terminal	Terminal			
M107	M107 126 (ICC brake switch signal) 12	128	Brake pedal	Slightly depressed	Approx. 0
IVI 107		120		Fully released	Battery voltage

Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 3.

2. CHECK OVERALL FUNCTION-II

(P) With CONSULT-III

Select "BRAKE SW2" and check indication under the following conditions.

Monitor item	Condition		Indication
BRAKE SW2	Brake pedal	Slightly depressed	ON
	brake pedar	Fully released	OFF

EC-431 Revision: 2009 March 2009 FX35/FX50

D

Е

F

Н

Ν

< DTC/CIRCUIT DIAGNOSIS >

⋈ Without CONSULT-III

Check the voltage between ECM harness connector terminals under the following conditions.

ECM						
Connector	+ – Condition		Voltage (V)			
Connector	Terminal	Terminal				
M107	122	128	Brake pedal	Slightly depressed	Battery voltage	
WITO	(Stop lamp switch signal)	120		Fully released	Approx. 0	

Is the inspection result normal?

YES >> GO TO 17. NO >> GO TO 11.

3.CHECK ICC BRAKE SWITCH POWER SUPPLY CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect ICC brake switch harness connector.
- 3. Turn ignition switch ON.
- 4. Check the voltage between ICC brake switch harness connector and ground.

ICC brake switch		Ground	Voltage	
Connector	Terminal	Giodila	voltage	
E114	1	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 8. NO >> GO TO 4.

4. CHECK ICC BRAKE HOLD RELAY CIRCUIT

- Turn ignition switch OFF.
- Disconnect ICC brake hold relay harness connector.
- 3. Turn ignition switch ON.
- 4. Check the voltage between ICC brake hold relay harness connector and ground.

ICC brake hold relay		Ground	Voltage	
Connector	Terminal	Ground	voltage	
E91	3	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 6. NO >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E103
- 10 A fuse (No. 3)
- Harness for open or short between ICC brake hold relay switch and fuse

>> Repair open circuit, short to ground or short to power in harness or connectors.

6.CHECK ICC BRAKE SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT-I

- Turn ignition switch OFF.
- Check the continuity ICC brake hold relay harness connector and ICC brake switch harness connector.

P1572 ICC BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

< DTC/CIRCOIT	DIAGNO	/010 /				<u>-</u>
ICC brake hold	relav	ICC brak	ke switch			A
· · · · · · · · · · · · · · · · · · ·	Terminal	Connector	Terminal	- Continuity		
E91	4	E114	1	Existed		EC
3. Also check ha	arness fo	r short to grou	nd and short	to power.		
s the inspection r		mal?				
YES >> GO T NO >> Repa	-	irouit abort to	around or ob	ort to nowar in l	cornect or connectors	(
7.CHECK ICC B	-		ground or sn	or to power in i	narness or connectors.	
			/100 Davids	11-1-1 D -1 All		- [
Refer to <u>EC-436.</u>			i (ICC Brake	Hold Relay)".		
<u>ls the inspection r</u> YES >> GO T		<u>mar:</u>				
		rake hold rela	y.			-
8.CHECK ICC B	RAKE S\	WITCH INPUT	SIGNAL CIF	RCUIT FOR OP	EN AND SHORT-II	
1. Turn ignition s						- F
Disconnect E	CM harn	ess connector.			1=011	
3. Check the co	ntinuity b	etween ICC bi	rake switch h	arness connect	or and ECM harness connector.	
ICC brake switch		ECM				(
Connector Termin	nal Conne		Continuity			
E114 2	M10		Existed			
4. Also check ha				to power		
Is the inspection r		•		рожон		
YES >> GO T	O 10.					
NO >> GO T						
9. DETECT MALI	FUNCTIO	ONING PART				
Check the following	ng.	0.140				_
Harness connecHarness for ope			C brake switch	h and FCM		
	0. 0		brane emile			
>> Repa	ir open ci	ircuit, short to	ground or sh	ort to power in I	narness or connectors.	
10. CHECK ICC	BRAKE	SWITCH				
Refer to EC-435,	"Compor	nent Inspection	(ICC Brake	Switch)".		_
ls the inspection r	•	<u>-</u>				
YES >> GO T						
•		orake switch.				
11. снеск sто	P LAMP	SWITCH POV	WER SUPPL	Y CIRCUIT		
1. Turn ignition						_
 Disconnect st Disconnect IC 		switch harnes: hold relay	s connector.			(
			p switch harr	ness connector	and ground.	

Stop lam	p switch	Ground	Voltage	
Connector Terminal		Ground	voltage	
E110	3	Ground	Battery voltage	

5. Check the voltage between ICC brake hold relay harness connector and ground.

< DTC/CIRCUIT DIAGNOSIS >

ICC brake	hold relay	Ground	Voltage
Connector	Terminal	Giodila	voltage
E91	7	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 13. NO >> GO TO 12.

12. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E103
- 10 A fuse (No. 7)
- · Harness for open or short between battery and stop lamp switch
- Harness for open or short between battery and ICC brake hold relay

>> Repair open circuit, short to ground or short to power in harness or connectors.

13.check stop lamp switch input signal circuit for open and short

- 1. Disconnect ECM harness connector.
- Check the continuity between stop lamp switch harness connector and ECM harness connector.

Stop lam	p switch	EC	Continuity	
Connector	Terminal	Connector	Terminal	Continuity
E110	4	M107	122	Existed

3. Check the continuity between ICC brake hold relay harness connector and ECM harness connector.

ICC brake hold relay		ECM		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E91	6	M107	122	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 15. NO >> GO TO 14.

14. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E103, M2
- · Harness for open or short between ECM and stop lamp switch
- Harness for open or short between ECM and ICC brake hold relay

>> Repair open circuit, short to ground or short to power in harness or connectors.

15. CHECK STOP LAMP SWITCH

Refer to EC-435, "Component Inspection (Stop Lamp Switch)".

Is the inspection result normal?

YES >> GO TO 16.

NO >> Replace stop lamp switch.

16.CHECK ICC BRAKE HOLD RELAY

Refer to EC-436, "Component Inspection (ICC Brake Hold Relay)".

Is the inspection result normal?

YES >> GO TO 17.

NO >> Replace ICC brake hold relay.

P1572 ICC BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

17. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

EC

D

Е

Component Inspection (ICC Brake Switch)

INFOID:0000000003856331

1. CHECK ICC BRAKE SWITCH-I

- Turn ignition switch OFF.
- Disconnect ICC brake switch harness connector. 2.
- Check the continuity between ICC brake switch terminals under the following conditions.

Terminals	Condition		Continuity
1 and 2	Brake pedal	Fully released	Existed
T and 2	brake pedar	Slightly depressed	Not existed

Is the inspection result normal?

>> INSPECTION END YES

NO >> GO TO 2.

2.CHECK ICC BRAKE SWITCH-II

- Adjust ICC brake switch installation. Refer to BR-19, "Inspection and Adjustment".
- 2. Check the continuity between ICC brake switch terminals under the following conditions.

Terminals	Condition		Continuity
1 and 2	Brake pedal	Fully released	Existed
1 410 2	Бтаке рецаі	Slightly depressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace ICC brake switch.

Component Inspection (Stop Lamp Switch)

INFOID:0000000003856332

N

1.CHECK STOP LAMP SWITCH-I

- 1. Turn ignition switch OFF.
- Disconnect stop lamp switch harness connector.
- Check the continuity between stop lamp switch terminals under the following conditions.

Terminals	Condition		Continuity
3 and 4	Brake pedal	Fully released	Not existed
3 and 4	Бтакс ресса	Slightly depressed	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.CHECK STOP LAMP SWITCH-II

- Adjust stop lamp switch installation. Refer to BR-19, "Inspection and Adjustment".
- Check the continuity between stop lamp switch terminals under the following conditions.

Terminals	Condition		Continuity
3 and 4	Brake pedal	Fully released	Not existed
3 and 4	brake pedar	Slightly depressed	Existed

Is the inspection result normal?

EC-435 Revision: 2009 March 2009 FX35/FX50

P1572 ICC BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

YES >> INSPECTION END

NO >> Replace stop lamp switch.

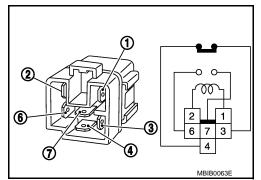
Component Inspection (ICC Brake Hold Relay)

INFOID:0000000003856333

1. CHECK ICC BRAKE HOLD RELAY

- 1. Turn ignition switch OFF.
- 2. Remove ICC brake hold relay.
- 3. Check the continuity between ICC brake hold relay terminals under the following conditions.

Terminals	Condition	Continuity
3 and 4	12 V direct current supply between terminals 1 and 2	Not existed
3 and 4	No current supply	Existed
6 and 7	12 V direct current supply between terminals 1 and 2	Existed
o and r	No current supply	Not existed



Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace ICC brake hold relay

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

INFOID:0000000003856335

P1574 ASCD VEHICLE SPEED SENSOR

Description INFOID:0000000003856334

The ECM receives two vehicle speed signals via CAN communication line. One is sent from "unified meter and A/C amp.", and the other is from TCM (Transmission control module). The ECM uses these signals for ASCD control. Refer to EC-66, "System Description" for ASCD functions.

EC

Α

DTC Logic

DTC DETECTION LOGIC

- If DTC P1574 is displayed with DTC UXXXX, first perform the trouble diagnosis for DTC UXXXX.
- If DTC P1574 is displayed with DTC P0500, first perform the trouble diagnosis for DTC P0500. Refer to EC-347, "DTC Logic".
- If DTC P1574 is displayed with DTC P0605, first perform the trouble diagnosis for DTC P0605. Refer to EC-358, "DTC Logic".
- If DTC P1574 is displayed with DTC P0607, first perform the trouble diagnosis for DTC P0607. Refer to EC-360, "DTC Logic".

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	(
P1574	ASCD vehicle speed sensor	The difference between the two vehicle speed signals is out of the specified range.	Harness or connectors (The CAN communication line is open or shorted.) Unified meter and A/C amp. ABS actuator and electric unit (control unit) Wheel sensor TCM ECM	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- Start engine (VDC switch OFF).
- Drive the vehicle at more than 40 km/h (25 MPH).

CAUTION:

Always drive vehicle at a safe speed.

This procedure may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

Check DTC.

Is DTC detected?

YFS >> Go to EC-437, "Diagnosis Procedure".

>> INSPECTION END NO

Diagnosis Procedure

1. CHECK DTC WITH TCM

Check DTC with TCM. Refer to TM-74, "Diagnosis Description".

Is the inspection result normal?

EC-437 Revision: 2009 March 2009 FX35/FX50

F

N

Р

INFOID:0000000003856336

P1574 ASCD VEHICLE SPEED SENSOR

YES >> GO TO 2.

NO >> Perform troubleshooting relevant to DTC indicated.

 $2.\mathsf{CHECK}$ DTC WITH "ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)"

Refer to BRC-44, "CONSULT-III Function".

Is the inspection result normal?

< DTC/CIRCUIT DIAGNOSIS >

YES >> GO TO 3.

NO >> Repair or replace malfunctioning part.

 ${\bf 3.}$ CHECK DTC WITH "UNIFIED METER AND A/C AMP."

Refer to MWI-45, "CONSULT-III Function (METER/M&A)".

>> INSPECTION END

[VQ35HR]

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

INFOID:0000000003856338

P1574 ICC VEHICLE SPEED SENSOR

Description INFOID:0000000003856337

The ECM receives two vehicle speed signals via CAN communication line. One is sent from "unified meter and A/C amp.", and the other is from TCM (Transmission control module). The ECM uses these signals for ICC control. Refer to CCS-24, "System Description" for ICC functions.

EC

Α

DTC Logic

DTC DETECTION LOGIC

- If DTC P1574 is displayed with DTC UXXXX, first perform the trouble diagnosis for DTC UXXXX.
- If DTC P1574 is displayed with DTC P0500, first perform the trouble diagnosis for DTC P0500. Refer to EC-347, "DTC Logic".
- If DTC P1574 is displayed with DTC P0605, first perform the trouble diagnosis for DTC P0605. Refer to EC-358, "DTC Logic".
- If DTC P1574 is displayed with DTC P0607, first perform the trouble diagnosis for DTC P0607. Refer to EC-360, "DTC Logic".

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1574	ICC vehicle speed sensor	ECM detects a difference between two vehicle speed signals is out of the specified range.	Harness or connectors (The CAN communication line is open or shorted.) Unified meter and A/C amp. ABS actuator and electric unit (control unit) Wheel sensor TCM ECM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- Start engine (VDC switch OFF).
- Drive the vehicle at more than 40 km/h (25 MPH).

CAUTION:

Always drive vehicle at a safe speed.

This procedure may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

Check DTC.

Is DTC detected?

YFS >> Go to EC-439, "Diagnosis Procedure".

>> INSPECTION END NO

Diagnosis Procedure

INFOID:0000000003856339

1. CHECK DTC WITH TCM

Check DTC with TCM. Refer to TM-74, "Diagnosis Description".

Is the inspection result normal?

EC-439 Revision: 2009 March 2009 FX35/FX50

F

N

Р

P1574 ICC VEHICLE SPEED SENSOR

[VQ35HR]

YES >> GO TO 2.

NO >> Perform troubleshooting relevant to DTC indicated.

 $2.\mathsf{CHECK}$ DTC WITH "ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)"

Refer to BRC-44, "CONSULT-III Function".

Is the inspection result normal?

< DTC/CIRCUIT DIAGNOSIS >

YES >> GO TO 3.

NO >> Repair or replace malfunctioning part.

3. CHECK DTC WITH "UNIFIED METER AND A/C AMP."

Check combination meter function.

Refer to MWI-45, "CONSULT-III Function (METER/M&A)".

>> INSPECTION END

EC-440 Revision: 2009 March 2009 FX35/FX50 < DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

INFOID:0000000003856344

P1805 BRAKE SWITCH

Description INFOID:0000000003856343

Brake switch signal is applied to the ECM through the stop lamp switch when the brake pedal is depressed. This signal is used mainly to decrease the engine speed when the vehicle is being driven.

EC

Α

DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1805	Brake switch	A brake switch signal is not sent to ECM for extremely long time while the vehicle is being driven.	I Ston Jamn switch circuit is onen or short-

Е

F

Н

D

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

- Turn ignition switch ON.
- Fully depress the brake pedal for at least 5 seconds.
- Erase the DTC.
- Check 1st trip DTC.

Is 1st trip DTC detected?

>> Go to EC-441, "Diagnosis Procedure". YES

>> INSPECTION END NO

Diagnosis Procedure

INFOID:0000000003856345

1. CHECK STOP LAMP SWITCH CIRCUIT

- Turn ignition switch OFF.
- Check the stop lamp illumination under the following conditions.

Con	Stop lamp	
Brake pedal	Fully released	Not illuminated
Біаке рецаі	Slightly depressed	Illuminated

Is the inspection result normal?

YES >> GO TO 4. NO >> GO TO 2.

M

Ν

Р

2.CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT

- Disconnect stop lamp switch harness connector.
- Check the voltage between stop lamp switch harness connector and ground.

Stop lam	p switch	Ground	Voltage
Connector Terminal		Giodila	vollago
E110	3	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E103
- 10 A fuse (No. 7)

EC-441 Revision: 2009 March

< DTC/CIRCUIT DIAGNOSIS >

- Harness for open or short between stop lamp switch and battery
 - >> Repair open circuit, short to ground or short to power in harness or connectors.

4. CHECK STOP LAMP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Disconnect stop lamp switch harness connector.
- Disconnect ECM harness connector.
- Check the continuity between stop lamp switch harness connector and ECM harness connector.

Stop lam	p switch	EC	Continuity	
Connector	Terminal	Connector	Terminal	Continuity
E110	4	M107	122	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 6. NO >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E103, M2
- Harness for open or short between ECM and stop lamp switch
 - >> Repair open circuit, short to ground or short to power in harness or connectors.

6. CHECK STOP LAMP SWITCH

Refer to EC-442, "Component Inspection (Stop Lamp Switch)".

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace stop lamp switch.

7. CHECK INTERMITTENT INCIDENT

Refer to GI-35. "Intermittent Incident".

>> INSPECTION END

Component Inspection (Stop Lamp Switch)

INFOID:0000000003856346

1. CHECK STOP LAMP SWITCH-I

- Turn ignition switch OFF.
- 2. Disconnect stop lamp switch harness connector.
- 3. Check the continuity between stop lamp switch terminals under the following conditions.

Terminals	C	Continuity	
3 and 4	Brake nedal	Fully released	Not existed
	Brake pedal	Slightly depressed	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.CHECK STOP LAMP SWITCH-II

- Adjust stop lamp switch installation. Refer to <u>BR-7</u>, "Inspection and Adjustment".
- 2. Check the continuity between stop lamp switch terminals under the following conditions.

P1805 BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Terminals	C	Continuity	
3 and 4	Brake pedal	Fully released	Not existed
	Diake pedal	Slightly depressed	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace stop lamp switch.

EC

Α

С

D

Е

F

G

Н

1

J

Κ

L

 \mathbb{N}

Ν

0

Р

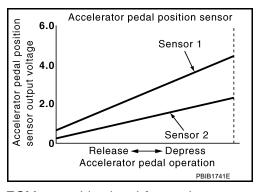
P2122, P2123 APP SENSOR

Description INFOID:0000000003856347

The accelerator pedal position sensor is installed on the upper end of the accelerator pedal assembly. The sensor detects the accelerator position and sends a signal to the ECM.

Accelerator pedal position sensor has two sensors. These sensors are a kind of potentiometer which transform the accelerator pedal position into output voltage, and emit the voltage signal to the ECM. In addition, these sensors detect the opening and closing speed of the accelerator pedal and sends voltage signals to the ECM. The ECM judges the current opening angle of the accelerator pedal from these signals and controls the throttle control motor based on these signals.

Idle position of the accelerator pedal is determined by the ECM receiving the signal from the accelerator pedal position sensor. The ECM uses this signal for engine operations such as fuel cut.



DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P2122 or P2123 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. Refer to EC-361, "DTC Logic".

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P2122	Accelerator pedal position (APP) sensor 1 circuit low input	An excessively low voltage from the APP sensor 1 is sent to ECM.	Harness or connectors (APP sensor 1 circuit is open or shorted.)
P2123	Accelerator pedal position (APP) sensor 1 circuit high input	An excessively high voltage from the APP sensor 1 is sent to ECM.	Accelerator pedal position sensor (APP sensor 1)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10 V at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine and let it idle for 1 second.
- Check DTC.

Is DTC detected?

YES >> Go to EC-444, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003856349

1. CHECK GROUND CONNECTION

- Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Revision: 2009 March **EC-444** 2009 FX35/FX50

P2122, P2123 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK ACCELERATOR PEDAL POSITION (APP) SENSOR 1 POWER SUPPLY CIRCUIT

- Disconnect APP sensor harness connector.
- Turn ignition switch ON. 2.
- Check the voltage between APP sensor harness connector and ground.

APP senso	Ground	Voltage (V)	
Connector Terminal		Ground	Voltage (V)
E112 (Without ICC)	5	Ground	Approx. 5
E116 (With ICC)	3	Ground	Αρρίολ. 3

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M6, E106
- Harness for open or short between ECM and APP sensor

>> Repair open circuit, short to ground or short to power in harness or connectors.

f 4.CHECK APP SENSOR 1 GROUND CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF. 1.
- Disconnect ECM harness connector. 2.
- Check the continuity between APP sensor harness connector and ECM harness connector.

APP sensor	ECM		Continuity	
Connector	Terminal	Connector	Terminal	Continuity
E112 (Without ICC)	4	M107	100	Existed
E116 (With ICC)	1	WITO	100	LAIGICU

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 5.

5.DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M6, E106
- Harness for open or short between ECM and APP sensor

>> Repair open circuit, short to ground or short to power in harness or connectors.

$\mathsf{6}.$ CHECK APP SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

Check the continuity between APP sensor harness connector and ECM harness connector.

EC

Α

D

F

Е

Н

Ν

Р

EC-445 Revision: 2009 March 2009 FX35/FX50

APP sensor	ECM		Continuity	
Connector	Terminal	Connector	Terminal	Continuity
E112 (Without ICC)	3	M107	97	Existed
E116 (With ICC)	4	IVITOT	31	LAISIGU

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 8. NO >> GO TO 7.

7.DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M6, E106
- Harness for open or short between ECM and APP sensor

>> Repair open circuit, short to ground or short to power in harness or connectors.

8. CHECK APP SENSOR

Refer to EC-446, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 10. NO >> GO TO 9.

9. REPLACE ACCELERATOR PEDAL ASSEMBLY

- Replace accelerator pedal assembly.
- 2. Go to EC-447, "Special Repair Requirement".

>> INSPECTION END

10. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000003856350

1. CHECK ACCELERATOR PEDAL POSITION (APP) SENSOR

- 1. Turn ignition switch OFF.
- 2. Reconnect all harness connectors disconnected.
- 3. Turn ignition switch ON.
- 4. Check the voltage ECM harness connector terminals under the following conditions.

ECM						
Connector	+	_	Condition		Voltage (V)	
Connector	Terminal	Terminal				
	97 (APP sensor 1) 100	100	Accelerator pedal	Fully released	0.45 - 1.0	
M107				Fully depressed	4.4 - 4.8	
WITO7		104		Fully released	0.22 - 0.50	
	98 (APP sensor 2)	2) 104		Fully depressed	2.1 - 2.5	

Is the inspection result normal?

YES >> INSPECTION END

P2122, P2123 APP SENSOR

[VQ35HR] < DTC/CIRCUIT DIAGNOSIS > NO >> GO TO 2. 2. REPLACE ACCELERATOR PEDAL ASSEMBLY Α 1. Replace accelerator pedal assembly. 2. Go to EC-447, "Special Repair Requirement". EC >> INSPECTION END Special Repair Requirement INFOID:0000000003856351 1. PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING D Refer to EC-25, "ACCELERATOR PEDAL RELEASED POSITION LEARNING: Special Repair Requirement". >> GO TO 2. Е 2.PERFORM THROTTLE VALVE CLOSED POSITION LEARNING Refer to EC-25, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement". F >> GO TO 3. 3. PERFORM IDLE AIR VOLUME LEARNING Refer to EC-25, "IDLE AIR VOLUME LEARNING: Special Repair Requirement". Н >> END M Ν

EC-447 Revision: 2009 March 2009 FX35/FX50

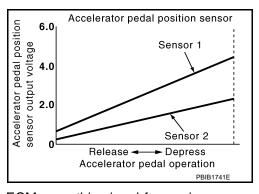
P2127, P2128 APP SENSOR

Description

The accelerator pedal position sensor is installed on the upper end of the accelerator pedal assembly. The sensor detects the accelerator position and sends a signal to the ECM.

Accelerator pedal position sensor has two sensors. These sensors are a kind of potentiometer which transform the accelerator pedal position into output voltage, and emit the voltage signal to the ECM. In addition, these sensors detect the opening and closing speed of the accelerator pedal and sends voltage signals to the ECM. The ECM judges the current opening angle of the accelerator pedal from these signals and controls the throttle control motor based on these signals.

Idle position of the accelerator pedal is determined by the ECM receiving the signal from the accelerator pedal position sensor. The ECM uses this signal for engine operations such as fuel cut.



DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P2127	Accelerator pedal position (APP) sensor 2 circuit low input	An excessively low voltage from the APP sensor 2 is sent to ECM.	Harness or connectors (APP sensor 2 circuit is open or shorted.) [Crankshaft position (CKP) sensor circuit
P2128	Accelerator pedal position (APP) sensor 2 circuit high input	An excessively high voltage from the APP sensor 2 is sent to ECM.	is shorted.] [Camshaft position (CMP) sensor (bank 2) circuit is shorted.] [Exhaust valve timing (EVT) control position sensor (bank 2) circuit is shorted.] (Battery current sensor circuit is shorted.) (EVAP control system pressure sensor circuit is shorted.) (Refrigerant pressure sensor circuit is shorted.) (Refrigerant pressure sensor circuit is shorted.) • APP sensor (APP sensor 2) • CKP sensor • CMP sensor (bank 2) • EVT control position sensor (bank 2) • Battery current sensor • EVAP control system pressure sensor • Refrigerant pressure sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10 V at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine and let it idle for 1 second.
- Check DTC.

P2127, P2128 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Is DTC detected?

YES >> Go to EC-449, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003856354

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- 2. Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK ACCELERATOR PEDAL POSITION (APP) SENSOR 2 POWER SUPPLY CIRCUIT-I

- 1. Disconnect APP sensor harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between APP sensor harness connector and ground.

APP sensor		Ground	Voltage (V)
Connector	Terminal	Giodila	voilage (v)
E112 (Without ICC)	6	Ground	Approx. 5
E116 (With ICC)	3	Ciouna	πρρίολ. σ

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 3.

3.CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT-II

- Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check the continuity between APP sensor harness connector and ECM harness connector.

APP sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E112 (Without ICC)	6	M107	103	Existed
E116 (With ICC)	3	IVITOT	103	LAISIEU

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M6, E106
- · Harness for open between ECM and APP sensor

>> Repair open circuit.

CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT-III

Check harness for short to power and short to ground, between the following terminals.

EC

Α

Е

D

F

ш

J

K

Ν

EC	CM	Sensor		
Connector	Terminal	Name	Connector	Terminal
F101	46	Crankshaft position (CKP) sensor	F2	1
		Camshaft position (CMP) sensor (bank 2)	F18	1
F102	64	Exhaust valve timing (EVT) control position sensor (bank 2)	F19	1
		Battery current sensor	E21	1
	103	APP sensor	E112 (Without ICC)	6
M107	AFF Selisoi	E116 (With ICC)	3	
	107	EVAP control system pressure sensor	B252	3
	111	Refrigerant pressure sensor	E77	3

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair short to ground or short to power in harness or connectors.

6. CHECK COMPONENTS

Check the following.

- CKP (Refer to EC-273, "Component Inspection".)
- CMP sensor (bank 2) (Refer to EC-279, "Component Inspection".)
- EVT control position sensor (bank 2) (Refer to EC-371, "Component Inspection".)
- Battery current sensor (Refer to EC-402, "Component Inspection".)
- EVAP control system pressure sensor (Refer to <u>EC-315, "Component Inspection"</u>.)
- Refrigerant pressure sensor (Refer to <u>HAC-85</u>, "<u>Diagnosis Procedure</u>".)

Is the inspection result normal?

YES >> GO TO 13.

NO >> Replace malfunctioning component.

7.CHECK APP SENSOR 2 GROUND CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check the continuity between APP sensor harness connector and ECM harness connector.

APP sensor		E		
APP Selisoi		ECM		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E112 (Without ICC)	2	M107	104	Existed
E116 (With ICC)	2	IVITO7	104	LXISIGU

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 9.

NO >> GO TO 8.

8.DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M6, E106
- Harness for open or short between ECM and APP sensor

>> Repair open circuit, short to ground or short to power in harness or connectors.

9. CHECK APP SENSOR 2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

P2127, P2128 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Check the continuity between APP sensor harness connector and ECM harness connector.

APP sensor	APP sensor		ECM	
Connector	Terminal	Connector	Terminal	Continuity
E112 (Without ICC)	1	M107	98	Existed
E116 (With ICC)	6	M107	90	LAISIGU

EC

D

Α

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 11. NO >> GO TO 10.

Е

10. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M6, E106
- · Harness for open or short between ECM and accelerator pedal position sensor

>> Repair open circuit, short to ground or short to power in harness or connectors.

11. CHECK APP SENSOR

Refer to EC-451, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 13. NO >> GO TO 12.

12. REPLACE ACCELERATOR PEDAL ASSEMBLY

- 1. Replace accelerator pedal assembly.
- Go to <u>EC-452</u>, "Special Repair Requirement".

>> INSPECTION END

13. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000004155452

Ν

1. CHECK ACCELERATOR PEDAL POSITION (APP) SENSOR

- 1. Turn ignition switch OFF.
- Reconnect all harness connectors disconnected.
- Turn ignition switch ON.
- Check the voltage ECM harness connector terminals under the following conditions.

ECM		Condition				
Connector + -				Voltage (V)		
Connector	Terminal	Terminal				
	97 (APP sensor 1)	100	100		Fully released	0.45 - 1.0
M107	37 (AFF Sellsoi I)		Accelerator pedal	Fully depressed	4.4 - 4.8	
WHO	98 (APP sensor 2)	404	Accelerator pedar	Fully released	0.22 - 0.50	
	90 (AFF Sellsol 2)	104	104	Fully depressed	2.1 - 2.5	

Is the inspection result normal?

P2127, P2128 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

YES >> INSPECTION END

NO >> GO TO 2.

2. REPLACE ACCELERATOR PEDAL ASSEMBLY

- 1. Replace accelerator pedal assembly.
- 2. Go to EC-457, "Special Repair Requirement".

>> INSPECTION END

Special Repair Requirement

INFOID:0000000004155454

1. PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING

Refer to EC-25, "ACCELERATOR PEDAL RELEASED POSITION LEARNING: Special Repair Requirement".

>> GO TO 2.

2.PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Refer to EC-25, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement".

>> GO TO 3.

3. PERFORM IDLE AIR VOLUME LEARNING

Refer to EC-25, "IDLE AIR VOLUME LEARNING: Special Repair Requirement".

>> END

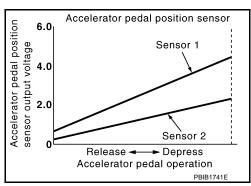
P2138 APP SENSOR

Description INFOID:0000000003943207

The accelerator pedal position sensor is installed on the upper end of the accelerator pedal assembly. The sensor detects the accelerator position and sends a signal to the ECM.

Accelerator pedal position sensor has two sensors. These sensors are a kind of potentiometer which transform the accelerator pedal position into output voltage, and emit the voltage signal to the ECM. In addition, these sensors detect the opening and closing speed of the accelerator pedal and sends voltage signals to the ECM. The ECM judges the current opening angle of the accelerator pedal from these signals and controls the throttle control motor based on these signals.

Idle position of the accelerator pedal is determined by the ECM receiving the signal from the accelerator pedal position sensor. The ECM uses this signal for engine operations such as fuel cut.



DTC Logic INFOID:0000000003856358

DTC DETECTION LOGIC

NOTE:

If DTC P2138 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. Refer to EC-361, "DTC Logic".

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P2138	Accelerator pedal position (APP) sensor circuit range/performance	Rationally incorrect voltage is sent to ECM compared with the signals from APP sensor 1 and APP sensor 2.	Harness or connectors (APP sensor 2 circuit is open or shorted.) [Crankshaft position (CKP) sensor circuit is shorted.] [Camshaft position (CMP) sensor (bank 2) circuit is shorted.] [Exhaust valve timing (EVT) control position sensor (bank 2) circuit is shorted.] (Battery current sensor circuit is shorted.) (EVAP control system pressure sensor circuit is shorted.) (Refrigerant pressure sensor circuit is shorted.) APP sensor (APP sensor 2) CKP sensor CMP sensor (bank 2) EVT control position sensor (bank 2) Battery current sensor EVAP control system pressure sensor Refrigerant pressure sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON. 2.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10 V at idle.

>> GO TO 2.

EC-453 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

Н

Ν

Р

< DTC/CIRCUIT DIAGNOSIS >

2.perform dtc confirmation procedure

- 1. Start engine and let it idle for 1 second.
- Check DTC.

Is DTC detected?

YES >> Go to EC-454, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003856359

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- 2. Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK ACCELERATOR PEDAL POSITION (APP) SENSOR 1 POWER SUPPLY CIRCUIT

- 1. Disconnect APP sensor harness connector.
- 2. Turn ignition switch ON.
- Check the voltage between APP sensor harness connector and ground.

APP sensor		Ground	Voltage (V)	
Connector	Terminal	Glound	voltage (v)	
E112 (Without ICC)	5	Ground	Approx. 5	
E116 (With ICC)	3	Oround	Αρρίολ. 3	

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M6, E106
- Harness for open or short between ECM and accelerator pedal position sensor
 - >> Repair open circuit, short to ground or short to power in harness or connectors.

4. CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT-I

- 1. Turn ignition switch ON.
- 2. Check the voltage between APP sensor harness connector and ground.

APP sensor	Ground	Voltage (V)		
Connector	Terminal	Giodila	voitage (v)	
E112 (Without ICC)	6	Ground	Approx. 5	
E116 (With ICC)	3	Oround	Αρρίολ. 3	

Is the inspection result normal?

YES >> GO TO 9. NO >> GO TO 5.

5. CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT-II

1. Turn ignition switch OFF.

- Disconnect ECM harness connector.
- Check the continuity between APP sensor harness connector and ECM harness connector.

APP sensor	•	ECM		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E112 (Without ICC)	6	M107	103	Existed
E116 (With ICC)	3	WITOT	103	LAISIEU

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M6, E106
- Harness for open between ECM and APP sensor

>> Repair open circuit.

7.CHECK SENSOR POWER SUPPLY CIRCUIT

Check harness for short to power and short to ground, between the following terminals.

E	CM	Sensor			
Connector	Terminal	Name	Connector	Terminal	
F101	46	Crankshaft position (CKP) sensor	F2	1	
		Camshaft position (CMP) sensor (bank 2)	F18	1	
F102	F102 64 Exhaust valve timing (EVT) control position sensor (bank 2)		64	F19	1
		Battery current sensor	E21	1	
	400 455		E112 (Without ICC)	6	
103 M107		APP sensor	E116 (With ICC)	3	
	107	EVAP control system pressure sensor	B252	3	
	111	Refrigerant pressure sensor	E77	3	

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair short to ground or short to power in harness or connectors.

8. CHECK COMPONENTS

Check the following.

- CKP sensor (Refer to <u>EC-273, "Component Inspection"</u>.)
- CMP sensor (bank 2) (Refer to EC-279, "Component Inspection".)
- EVT control position sensor (bank 2) (Refer to <u>EC-371, "Component Inspection"</u>.)
- Battery current sensor (Refer to <u>EC-402</u>, "Component Inspection".)
- EVAP control system pressure sensor (Refer to EC-315, "Component Inspection".)
- Refrigerant pressure sensor (Refer to <u>HAC-85, "Diagnosis Procedure"</u>.)

Is the inspection result normal?

YES >> GO TO 15.

NO >> Replace malfunctioning component.

9.CHECK APP SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

Turn ignition switch OFF.

Revision: 2009 March

EC

Α

D

Е

F

Н

Ν

< DTC/CIRCUIT DIAGNOSIS >

- 2. Disconnect ECM harness connector.
- 3. Check the continuity between APP sensor harness connector and ECM harness connector.

APP sensor		EC	Continuity	
Connector	Terminal	Connector	Terminal	Continuity
E112	4		100	
(Without ICC)	2	M107	104	Existed
E116	1	IVITO7	100	Existed
(With ICC)	2		104	

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 11. NO >> GO TO 10.

10. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M6, E106
- Harness for open or short between ECM and APP sensor

>> Repair open circuit, short to ground or short to power in harness or connectors.

11. CHECK APP SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between APP sensor harness connector and ECM harness connector.

APP sensor	EC	Continuity			
Connector	Terminal	Connector	Terminal	Continuity	
E112	3		97		
(Without ICC)	1	M107	98	Existed	
E116	4	IVITOT	97	LAISIEU	
(With ICC)	6		98		

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 13.

NO >> GO TO 12.

12. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M6, E106
- · Harness for open or short between ECM and APP sensor

>> Repair open circuit, short to ground or short to power in harness or connectors.

13. CHECK APP SENSOR

Refer to EC-457, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 15.

NO >> GO TO 14.

14. REPLACE ACCELERATOR PEDAL ASSEMBLY

- 1. Replace accelerator pedal assembly.
- Go to <u>EC-457</u>. "Special Repair Requirement".

>> INSPECTION END

P2138 APP SENSOR [VQ35HR] < DTC/CIRCUIT DIAGNOSIS > 15. CHECK INTERMITTENT INCIDENT Refer to GI-35, "Intermittent Incident". >> INSPECTION END EC Component Inspection INFOID:0000000004155453 1. CHECK ACCELERATOR PEDAL POSITION (APP) SENSOR Turn ignition switch OFF. Reconnect all harness connectors disconnected. 2. D Turn ignition switch ON. 3. Check the voltage ECM harness connector terminals under the following conditions. Е ECM Condition Voltage (V) Connector **Terminal Terminal** Fully released 0.45 - 1.097 (APP sensor 1) 100 Fully depressed 4.4 - 4.8 M107 Accelerator pedal Fully released 0.22 - 0.5098 (APP sensor 2) 104 Fully depressed 2.1 - 2.5 Is the inspection result normal? Н YES >> INSPECTION END NO >> GO TO 2. 2.replace accelerator pedal assembly Replace accelerator pedal assembly. Go to EC-457, "Special Repair Requirement". >> INSPECTION END Special Repair Requirement INFOID:0000000004155455 ${f 1}$.PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING Refer to EC-25, "ACCELERATOR PEDAL RELEASED POSITION LEARNING: Special Repair Requirement". >> GO TO 2. M 2.PERFORM THROTTLE VALVE CLOSED POSITION LEARNING Refer to EC-25, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement". Ν

>> GO TO 3.

3.PERFORM IDLE AIR VOLUME LEARNING

Refer to EC-25, "IDLE AIR VOLUME LEARNING: Special Repair Requirement".

>> END

Revision: 2009 March EC-457 2009 FX35/FX50

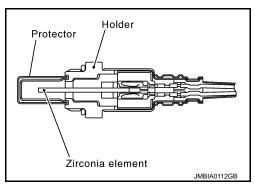
P2A00, P2A03 A/F SENSOR 1

Description

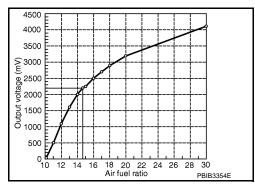
The air fuel ratio (A/F) sensor 1 is a planar one-cell limit current sensor. The sensor element of the A/F sensor 1 is composed an electrode layer, which transports ions. It has a heater in the element.

The sensor is capable of precise measurement $\lambda = 1$, but also in the lean and rich range. Together with its control electronics, the sensor outputs a clear, continuous signal throughout a wide λ range.

The exhaust gas components diffuse through the diffusion layer at the sensor cell. An electrode layer is applied voltage, and this current relative oxygen density in lean. Also this current relative hydrocarbon density in rich.



Therefore, the A/F sensor 1 is able to indicate air fuel ratio by this electrode layer of current. In addition, a heater is integrated in the sensor to ensure the required operating temperature of approximately 800°C (1,472°F).



DTC Logic

DTC DETECTION LOGIC

To judge the malfunction, the air fuel ratio (A/F) signal computed by ECM from the A/F sensor 1 signal is monitored so it will not shift to LEAN side or RICH side.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P2A00	A/F sensor 1 (bank 1) circuit range/performance	A/F sensor 1 signal shifts to the lean side for a	A/F sensor 1 A/F sensor 1 heater
P2A03	A/F sensor 1 (bank 2) circuit range/performance	 specified period. The A/F signal computed by ECM from the A/F sensor 1 signal shifts to the rich side for a specified period. 	Fuel pressureFuel injectorIntake air leaks

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 11 V at idle.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- 1. Clear the mixture ratio self-learning value. Refer to EC-28, "MIXTURE RATIO SELF-LEARNING VALUE CLEAR: Special Repair Requirement".
- 2. Turn ignition switch OFF and wait at least 10 seconds.

P2A00, P2A03 A/F SENSOR 1

< DTC/CIRCUIT DIAGNOSIS >	[VQ35HR]
 Turn ignition switch ON. Turn ignition switch OFF and wait at least 10 seconds. Start engine and keep the engine speed between 3,500 and 4,000 rpm for 1 minute under no Let engine idle for 1 minute. Keep engine speed between 2,500 and 3,000 rpm for 20 minutes. 	
8. Check 1st trip DTC.	EC
Is 1st trip DTC detected?	
YES >> Go to <u>EC-459, "Diagnosis Procedure"</u> . NO >> INSPECTION END	С
Diagnosis Procedure	FOID:00000000003856364
1. CHECK GROUND CONNECTION	D
 Turn ignition switch OFF. Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection". 	E
Is the inspection result normal? YES >> GO TO 2.	
NO >> Repair or replace ground connection.	F
2.RETIGHTEN AIR FUEL RATIO (A/F) SENSOR 1	
Loosen and retighten the A/F sensor 1. Refer to EM-36, "Removal and Installation".	G
>> GO TO 3.	
3. CHECK FOR INTAKE AIR LEAK	Н
 Start engine and run it at idle. Listen for an intake air leak after the mass air flow sensor. 	
Is intake air leak detected?	I
YES >> Repair or replace malfunctioning part. NO >> GO TO 4.	
4.CLEAR THE MIXTURE RATIO SELF-LEARNING VALUE	J
 Clear the mixture ratio self-learning value. Refer to <u>EC-28</u>. "MIXTURE RATIO SELF-LEARNING CLEAR: Special Repair Requirement". Run engine for at least 10 minutes at idle speed. 	ING VALUE
Is the 1st trip DTC P0171, P0172, P0174 or P0175 detected? Is it difficult to start engine?	
YES >> Perform trouble diagnosis for DTC P0171, P0174 or P0172, P0175. Refer to <u>EC-238</u> . <u>Procedure</u> or <u>EC-242, "Diagnosis Procedure"</u> . NO >> GO TO 5.	<u>, "Diagnosis</u> L
5. CHECK HARNESS CONNECTOR	M
 Turn ignition switch OFF. Disconnect A/F sensor 1 harness connector. 	
Check harness connector for water.	N
Water should not exit.	
Is the inspection result normal?	0
YES >> GO TO 6. NO >> Repair or replace harness connector.	
6.CHECK A/F SENSOR 1 POWER SUPPLY CIRCUIT	Р
 Turn ignition switch ON. Check the voltage between A/F sensor 1 harness connector and ground. 	

Revision: 2009 March **EC-459** 2009 FX35/FX50

DTC		A/F sensor 1		Ground	Voltage
DIC	Bank	Connector	Terminal	Giodila	voltage
P2A00	1	F3	4	Ground	Battery voltage
P2A03	2	F20	4	Giodila	Dattery Voltage

Is the inspection result normal?

YES >> GO TO 8. NO >> GO TO 7.

7.DETECT MALFUNCTIONING PART

Check the following.

- · Harness connectors E3, F1
- IPDM E/R harness connector E7
- 15 A fuse (No. 46)
- Harness for open or short between A/F sensor 1 and fuse

>> Repair or replace harness or connectors.

$8.\mathsf{CHECK}$ A/F SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check the continuity between A/F sensor 1 harness connector and ECM harness connector.

DTC	A/F sensor 1		1	EC	CM	Continuity
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity
P2A00	1	F3	1		57	
F2A00	Į.	го	2	F102	61	Existed
P2A03	2	F20	1	1 102	65	LXISIGU
1 2A03	P2A03 2 F20	2		66		

4. Check the continuity between A/F sensor 1 harness connector or ECM harness connector and ground.

DTC		A/F sensor 1		ECM		Ground	Continuity
DIC	Bank	Connector	Terminal	Connector	Terminal	Ground	Continuity
P2A00	1	F3	1		57		
F 2A00	PZA00 I	13	2	F102	61	Ground	Not existed
Davos	2	E20	1	1102	65	Giodila	Not existed
P2A03 2	F20	2		66			

5. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

9. CHECK A/F SENSOR 1 HEATER

Refer to EC-160, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 10. NO >> GO TO 11.

10. CHECK INTERMITTENT INCIDENT

Perform GI-35, "Intermittent Incident".

Is the inspection result normal?

YES >> GO TO 11.

P2A00, P2A03 A/F SENSOR 1

[VQ35HR] < DTC/CIRCUIT DIAGNOSIS > NO >> Repair or replace malfunctioning part. 11.REPLACE A/F SENSOR 1 Α Replace A/F sensor 1. **CAUTION:** EC Discard any A/F sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one. Before installing new A/F sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J-43897-12)] and approved anti-seize lubricant (commercial service tool). Will CONSULT-III be used? YES >> GO TO 12. D NO >> GO TO 13. 12.confirm a/f adjustment data Е With CONSULT-III Turn ignition switch ON. Select "A/F ADJ-B1" and "A/F ADJ-B2" in "DATA MONITOR" mode with CONSULT-III. F Make sure that "0.000" is displayed on CONSULT-III screen. Is "0.000" displayed? YES >> INSPECTION END NO >> GO TO 13. 13. CLEAR THE MIXTURE RATIO SELF-LEARNING VALUE Clear the mixture ratio self-learning value. Refer to EC-28, "MIXTURE RATIO SELF-LEARNING VALUE CLEAR: Special Repair Requirement". Will CONSULT-III be used? YES >> GO TO 14. NO >> INSPECTION END $14.\mathtt{confirm}$ a/f adjustment data (P)With CONSULT-III 1. Turn ignition switch ON. Select "A/F ADJ-B1" and "A/F ADJ-B2" in "DATA MONITOR" mode with CONSULT-III. K Make sure that "0.000" is displayed on CONSULT-III screen. >> INSPECTION END Ν Р

Revision: 2009 March EC-461 2009 FX35/FX50

ASCD BRAKE SWITCH

Description

When the brake pedal is depressed, ASCD brake switch is turned OFF and stop lamp switch is turned ON. ECM detects the state of the brake pedal by those two types of input (ON/OFF signal). Refer to EC-66, "System Description" for the ASCD function.

Component Function Check

INFOID:0000000003856366

1. CHECK ASCD BRAKE SWITCH FUNCTION

(II) With CONSULT-III

- 1. Turn ignition switch ON.
- Select "BRAKE SW1" in "DATA MONITOR" mode with CONSULT-III.
- 3. Check "BRAKE SW1" indication under the following conditions.

Monitor item	Condition		Indication
BRAKE SW1	Braka nadal	Slightly depressed	OFF
BIVARL SWI	Brake pedar	Fully released	ON

⋈ Without CONSULT-III

- Turn ignition switch ON.
- 2. Check the voltage between ECM harness connector terminals as follows.

ECM					
Connector	+	_	Condition Vol		Voltage (V)
Connector	Terminal Terminal				
M107	126	128	Brake pedal	Slightly depressed	Approx. 0
WITOT	(ASCD brake switch signal)	120	Brake pedal	Fully released	Battery voltage

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-462, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003856367

1. CHECK ASCD BRAKE SWITCH POWER SUPPLY CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect ASCD brake switch harness connector.
- Turn ignition switch ON.
- Check the voltage between ASCD brake switch harness connector and ground.

ASCD bra	ike switch	Ground	Voltage	
Connector	Connector Terminal		vollage	
E109	1	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E103
- 10 A fuse (No. 3)
- Harness for open or short between ASCD brake switch and fuse

ASCD BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

>> Repair open circuit, short to ground or short to power in harness or connectors.

${f 3.}$ CHECK ASCD BRAKE SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

Turn ignition switch OFF.

- Disconnect ECM harness connector.
- Check the continuity between ASCD brake switch harness connector and ECM harness connector.

EC

Α

ASCD brake switch		ECM		Continuity
Connector	Terminal	Connector	Connector Terminal	
E109	2	M107	126	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5. NO >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E106, M6
- · Harness for open or short between ECM and ASCD brake switch

>> Repair open circuit, short to ground or short to power in harness or connectors.

5. CHECK ASCD BRAKE SWITCH

Refer to EC-463, "Component Inspection (ASCD Brake Switch)"

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace ASCD brake switch.

O.CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection (ASCD Brake Switch)

INFOID:0000000003856368

1. CHECK ASCD BRAKE SWITCH-I

- Turn ignition switch OFF.
- Disconnect ASCD brake switch harness connector.
- Check the continuity between ASCD brake switch terminals under the following conditions.

Terminals	Condition		Continuity
1 and 2	Brake nedal	Fully released	Existed
i and 2	Brake pedal	Slightly depressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.CHECK ASCD BRAKE SWITCH-II

- Adjust ASCD brake switch installation. Refer to BR-7, "Inspection and Adjustment".
- Check the continuity between ASCD brake switch terminals under the following conditions.

Terminals	Condition		Continuity
1 and 2	Brako podal	Fully released	Existed
1 and 2	Brake pedal	Slightly depressed	Not existed

EC-463 Revision: 2009 March 2009 FX35/FX50

Е

N

ASCD BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace ASCD brake switch.

ASCD INDICATOR

[VQ35HR] < DTC/CIRCUIT DIAGNOSIS >

ASCD INDICATOR

Description INFOID:0000000003856369

ASCD operation status is indicated by two indicators (CRUISE and SET) and CRUISE lamp in combination

CRUISE indicator is displayed to indicated that ASCD system is ready for operation when MAIN switch on ASCD steering switch is turned ON.

SET indicator is displayed when the following conditions are met.

- CRUISE indicator is displayed.
- SET/COAST switch on ASCD steering switch is turned ON while vehicle speed is within the range of the ASCD setting.

SET indicator is displayed during ASCD control.

Refer to EC-66, "System Description" for the ASCD function.

Component Function Check

1. CHECK ASCD INDICATOR FUNCTION

Check ASCD indicator under the following conditions.

ASCD INDICATOR	CONDITION		SPECIFICATION
CRUISE LAMP	Ignition switch: ON	MAIN switch: Pressed at the 1st time → at the 2nd time	$ON \to OFF$
	MAIN switch: ON	ASCD: Operating	ON
SET LAMP	When vehicle speed is be- tween 40 km/h (25 MPH) and 144 km/h (89 MPH)	ASCD: Not operating	OFF

Is the inspection result normal?

YES >> INSPECTION END

>> Go to EC-465, "Diagnosis Procedure". NO

Diagnosis Procedure

1.CHECK DTC Check that DTC UXXXX is not displayed.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Perform trouble diagnosis for DTC UXXXX.

2.CHECK DTC WITH "UNIFIED METER AND A/C AMP."

Refer to MWI-45, "CONSULT-III Function (METER/M&A)".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace malfunctioning part.

3.check intermittent incident

Refer to GI-35. "Intermittent Incident".

Is the inspection result normal?

YES >> Replace combination meter.

>> Repair or replace malfunctioning part. NO

EC-465 Revision: 2009 March 2009 FX35/FX50

EC

Α

C

D

Е INFOID:0000000003856370

INFOID:000000000385637

K

Ν

Р

COOLING FAN

Description INFOID:000000003856372

COOLING FAN CONTROL MODULE

Cooling fan control module receives ON/OFF pulse duty signal from IPDM E/R. Corresponding to this ON/OFF pulse duty signal, cooling fan control module sends cooling fan motor operating voltage to cooling fan motor. The revolution speed of cooling fan motor is controlled by duty cycle of the voltage.

COOLING FAN MOTOR

Cooling fan motor receives cooling fan motor operating voltage from cooling fan control module. The revolution speed of cooling fan motor is controlled by duty cycle of the voltage.

Component Function Check

INFOID:0000000003856373

1. CHECK COOLING FAN FUNCTION

(I) With CONSULT-III

- 1. Turn ignition switch ON.
- 2. Perform "FAN DUTY CONTROL" in "ACTIVE TEST" mode with CONSULT-III.
- 3. Check that cooling fan speed varies according to the percentage.

Without CONSULT-III

- Perform IPDM E/R auto active test and check cooling fan motors operation, refer to <u>PCS-11, "Diagnosis Description"</u>.
- 2. Check that cooling fan operates.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-466, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003856374

1. CHECK COOLING FAN CONTROL MODULE 1 POWER SUPPLY CIRCUIT-I

- 1. Turn ignition switch OFF.
- 2. Disconnect cooling fan control module harness connector E37.
- Turn ignition switch ON.
- 4. Check the voltage between cooling fan control module 1 harness connector and ground.

Cooling fan co	ontrol module 1	Ground	Voltage	
Connector Terminal		Ground	voltage	
E37	3	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 7.

2.CHECK COOLING FAN CONTROL MODULE GROUND CIRCUIT

- Turn ignition switch OFF.
- 2. Check the continuity between cooling fan control module 1 harness connector and ground.

Cooling fan cor	ntrol module 1	Ground	Continuity	
Connector Terminal		Ground	Continuity	
E37	1	Ground	Existed	

3. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair open circuit or short to power in harness or connectors.

COOLING FAN

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

3.CHECK IPDM E/R GROUND CIRCUIT

- 1. Disconnect IPDM E/R harness connectors E5, E6.
- 2. Check the continuity between IPDM E/R harness connector and ground.

IPDM E/R		Ground	Continuity	
Connector Terminal		Ground		
E5	12	Ground	Existed	
E6	41	Giodila	LXISIEU	

3. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit or short to power in harness or connectors.

4. CHECK COOLING FAN CONTROL SIGNAL CIRCUIT

- 1. Disconnect IPDM E/R harness connector E9.
- Check the continuity between IPDM E/R harness connector and cooling fan control module 1 harness connector.

IPDM E/R		Cooling fan co	Continuity	
Connector	Terminal	Connector Terminal		Continuity
E9	97	E37	2	Existed

3. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

${f 5.}$ CHECK COOLING FAN CONTROL MODULE 1 OUTPUT SIGNAL CIRCUIT

- 1. Reconnect all harness connectors disconnected.
- 2. Disconnect cooling fan control module 1 harness connectors E301, E302.
- 3. Turn ignition switch ON.
- 4. Check the voltage between cooling fan control module 1 terminals and ground.

Cooling fan control module 1	Ground	Voltage	
Terminal	Giodila		
4	Ground	Battery voltage	
6	Ground		

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace cooling fan control module 1.

$oldsymbol{6}$.CHECK COOLING FAN MOTORS -1 AND -2

Refer to EC-468, "Component Inspection (Cooling Fan Motor)".

Is the inspection result normal?

YES >> GO TO 11.

NO >> Replace malfunctioning cooling fan motor.

7.CHECK COOLING FAN CONTROL MODULE 1 POWER SUPPLY CIRCUIT-II

- 1. Turn ignition switch OFF.
- 2. Disconnect cooling fan relay 1.
- Turn ignition switch ON.
- Check the voltage between cooling fan relay 1 harness connector and ground.

EC

П

Е

K

 \mathbb{N}

Ν

COOLING FAN

< DTC/CIRCUIT DIAGNOSIS >

Cooling fan relay 1		Ground	Voltage	
Connector	Terminal	Ground	Voltage	
E15	1	Ground	Battery voltage	
LIJ	3	Ground	Dattery Voltage	

Is the inspection result normal?

YES >> GO TO 9. NO >> GO TO 8.

8. DETECT MALFUNCTIONING PART

Check the following.

- 10 A fuse (No. 42)
- IPDM E/R harness connector E7
- 50 A fusible link (letter O)
- · Harness for open or short between cooling fan relay 1 and fuse
- Harness for open or short between cooling fan relay 1 and battery

>> Repair open circuit, short to ground or short to power in harness or connectors.

9. CHECK COOLING FAN CONTROL MODULE 1 POWER SUPPLY CIRCUIT-III

- 1. Turn ignition switch OFF.
- 2. Disconnect IPDM E/R harness connector E6.
- 3. Check the continuity between cooling fan relay 1 harness connector and IPDM E/R harness connector.

Cooling fan relay 1		IPDM E/R		Continuity
Connector	Terminal	Connector Terminal		Continuity
E15	2	E6	42	Existed

4. Check the continuity between cooling fan relay 1 harness connector and cooling fan control module 1 harness connector.

Cooling fan relay 1		Cooling fan co	Continuity	
Connector	Terminal	Connector Terminal		Continuity
E15	5	E37	3	Existed

5. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

10.CHECK COOLING FAN RELAY 1

Refer to EC-469, "Component Inspection (Cooling Fan Relay)".

Is the inspection result normal?

YES >> GO TO 11.

NO >> Replace cooling fan relay 1.

11. CHECK INTERMITTENT INCIDENT

Perform GI-35, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace IPDM E/R.

NO >> Repair or replace harness connectors.

Component Inspection (Cooling Fan Motor)

1. CHECK COOLING FAN MOTOR

Turn ignition switch OFF.

Revision: 2009 March **EC-468** 2009 FX35/FX50

INFOID:0000000003856375

COOLING FAN

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

- 2. Disconnect cooling fan control module 1 harness connectors E301, E302.
- 3. Supply cooling fan control module harness connector terminals with battery voltage and check operation.

	Cooling fan control module 1				
Operation	Terminal		Connector	Motor	
	(-)	(+)	Connector	IVIOLOI	
Cooling fan operates.	5	4	E301	1	
Cooling fair operates.	7	6	E302	2	

Component Inspection (Cooling Fan Relay)

EC

D

Е

F

Н

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace cooling fan motor.

INFOID:0000000003856376

1. CHECK COOLING FAN RELAY 1

1. Turn ignition switch OFF.

2. Remove cooling fan relay 1.

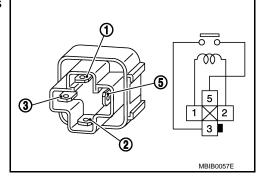
3. Check the continuity between cooling fan relay 1 terminals under the following conditions.

Terminals	Conditions	Continuity
3 and 5	12 V direct current supply between terminals 1 and 2	Existed
J and J	No current supply	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace cooling fan relay 1.



J

Κ

M

L

Ν

0

Р

Revision: 2009 March EC-469 2009 FX35/FX50

ELECTRICAL LOAD SIGNAL

Description INFOID:000000003856377

The electrical load signal (Headlamp switch signal, rear window defogger switch signal, etc.) is transferred through the CAN communication line.

Component Function Check

INFOID:0000000003856378

1. CHECK REAR WINDOW DEFOGGER SWITCH FUNCTION

- 1. Turn ignition switch ON.
- 2. Connect CONSULT-III and select "DATA MONITOR" mode.
- 3. Select "LOAD SIGNAL" and check indication under the following conditions.

Monitor item	Condition		Indication
LOAD SIGNAL	LOAD SIGNAL Rear window defogger switch	ON	ON
LOAD SIGNAL		OFF	OFF

Is the inspection result normal?

YES >> GO TO 2.

NO >> Go to EC-470, "Diagnosis Procedure".

2. CHECK LIGHTING SWITCH FUNCTION

Check "LOAD SIGNAL" indication under the following conditions.

Monitor item	Condition		Condition		Condition		Indication
LOAD SIGNAL	Lighting switch	ON at 2nd position	ON				
LOAD SIGNAL	Lighting switch	OFF	OFF				

Is the inspection result normal?

YES >> GO TO 3.

NO >> Go to EC-470, "Diagnosis Procedure".

3.CHECK HEATER FAN CONTROL SWITCH FUNCTION

Select "HEATER FAN SW" and check indication under the following conditions.

Monitor item	Condition		Indication
HEATER FAN SW	Heater fan control switch	ON	ON
TILATERTAN SW		OFF	OFF

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-470, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003856379

1. INSPECTION START

Confirm the malfunctioning circuit (rear window defogger, headlamp or heater fan). Refer to <u>EC-470, "Component Function Check"</u>.

Which circuit is related to the incident?

Rear window defogger>>GO TO 2.

Headlamp>>GO TO 3.

Heater fan>>GO TO 4.

2. CHECK REAR WINDOW DEFOGGER SYSTEM

Refer to DEF-3, "Work Flow".

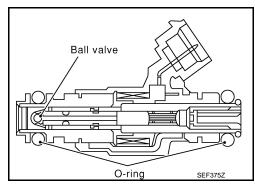
ELECTRICAL LOAD SIGNAL	[VQ35HR]
< DTC/CIRCUIT DIAGNOSIS > >> INSPECTION END	[۲۹331111]
3.CHECK HEADLAMP SYSTEM	А
Refer to EXL-5, "Work Flow".	
Refer to <u>EXE-5, WORK HOW</u> .	EC
>> INSPECTION END	EO
4.CHECK HEATER FAN CONTROL SYSTEM	
Refer to HAC-4, "Work Flow".	C
>> INSPECTION END	D
	E
	F
	Г
	G
	Н
	1
	J
	I/
	K
	L
	M
	N
	0
	O
	Р

Revision: 2009 March EC-471 2009 FX35/FX50

FUEL INJECTOR

Description INFOID:000000003856380

The fuel injector is a small, precise solenoid valve. When the ECM supplies a ground to the fuel injector circuit, the coil in the fuel injector is energized. The energized coil pulls the ball valve back and allows fuel to flow through the fuel injector into the intake manifold. The amount of fuel injected depends upon the injection pulse duration. Pulse duration is the length of time the fuel injector remains open. The ECM controls the injection pulse duration based on engine fuel needs.



Component Function Check

INFOID:0000000003856381

INFOID:0000000003856382

1.INSPECTION START

Turn ignition switch to START.

Are any cylinders ignited?

YES >> GO TO 2.

NO >> Go to EC-472, "Diagnosis Procedure".

2.check fuel injector function

(P)With CONSULT-III

- 1. Start engine.
- Perform "POWER BALANCE" in "ACTIVE TEST" mode with CONSULT-III.
- 3. Check that each circuit produces a momentary engine speed drop.

Without CONSULT-III

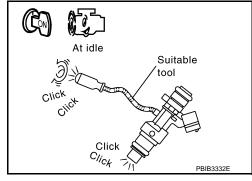
- 1. Start engine.
- 2. Listen to each fuel injector operating sound.

Clicking sound should be heard.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-472, "Diagnosis Procedure".



Diagnosis Procedure

1. CHECK FUEL INJECTOR POWER SUPPLY CIRCUIT

- Turn ignition switch OFF.
- Disconnect fuel injector harness connector.
- 3. Turn ignition switch ON.
- Check the voltage between fuel injector harness connector and ground.

	Fuel injector			Voltage
Cylinder	Connector	Terminal	Ground	voltage
1	F21	1		
2	F22	1		
3	F23	1	Ground	Battery voltage
4	F24	1	Giodila	Battery voltage
5	F25	1		
6	F26	1		

Is the inspection result normal?

YES >> GO TO 3. NO >> GO TO 2.

2.DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E3. F1
- IPDM E/R harness connector E7
- 10 A fuse (No. 44)
- Harness for open or short between fuel injector and fuse

>> Repair open circuit, short to ground or short to power in harness or connectors.

${f 3.}$ CHECK FUEL INJECTOR OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check the continuity between fuel injector harness connector and ECM harness connector.

Fuel injector			ECM		Continuity
Cylinder	Connector	Terminal	Connector	Terminal	Continuity
1	F21	2		89	
2	F22	2		85	
3	F23	2	F102	81	Existed
4	F24	2	1 102	90	LXISIEU
5	F25	2		86	
6	F26	2		82	

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5. NO >> GO TO 4

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F106, F107
- Harness for open or short between fuel injector and ECM

>> Repair open circuit, short to ground or short to power in harness or connectors.

5. CHECK FUEL INJECTOR

Refer to EC-474, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace malfunctioning fuel injector.

EC-473 Revision: 2009 March 2009 FX35/FX50

EC

Α

Е

F

Н

Ν

< DTC/CIRCUIT DIAGNOSIS >

6. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace IPDM E/R.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

Component Inspection

INFOID:0000000003856383

[VQ35HR]

1. CHECK FUEL INJECTOR

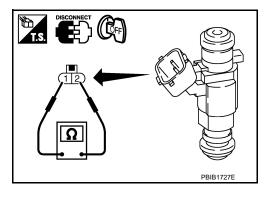
- 1. Turn ignition switch OFF.
- 2. Disconnect fuel injector harness connector.
- 3. Check resistance between fuel injector terminals as follows.

Terminals	Resistance
1 and 2	11.1 - 14.3 Ω [at 10 - 60°C (50 - 140°F)]

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace malfunctioning fuel injector.



Α

FUEL PUMP

Description INFOID:0000000003856384

Sensor	Input signal to ECM	ECM Function	Actuator
Crankshaft position sensor Camshaft position sensor	Engine speed*	Fuel pump control	Fuel pump relay ↓
Battery	Battery voltage*		Fuel pump

^{*:} ECM determines the start signal status by the signals of engine speed and battery voltage.

The ECM activates the fuel pump for several seconds after the ignition switch is turned ON to improve engine startability. If the ECM receives a engine speed signal from the camshaft position sensor, it knows that the engine is rotating, and causes the pump to operate. If the engine speed signal is not received when the ignition switch is ON, the engine stalls. The ECM stops pump operation and prevents battery discharging, thereby improving safety. The ECM does not directly drive the fuel pump. It controls the ON/OFF fuel pump relay, which in turn controls the fuel pump.

Condition	Fuel pump operation
Ignition switch is turned to ON.	Operates for 1 second.
Engine running and cranking	Operates.
When engine is stopped	Stops in 1.5 seconds.
Except as shown above	Stops.

Component Function Check

1. CHECK FUEL PUMP FUNCTION

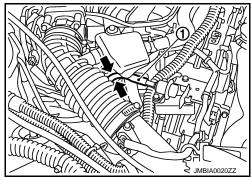
- Turn ignition switch ON.
- Pinch fuel feed hose (1) with two fingers.

Fuel pressure pulsation should be felt on the fuel feed hose for 1 second after ignition switch is turned ON.

Is the inspection result normal?

YES >> INSPECTION END

>> EC-475, "Diagnosis Procedure". NO



Diagnosis Procedure

${f 1}$.CHECK FUEL PUMP POWER SUPPLY CIRCUIT-I

- Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Turn ignition switch ON.
- Check the voltage between ECM harness connector and ground.

ECM		Ground	Voltage
Connector	Terminal	Ground	voltage
F101	22	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4. NO >> GO TO 2.

2.CHECK FUEL PUMP POWER SUPPLY CIRCUIT-II

INFOID:0000000003856386

INFOID:0000000003856385

EC-475 Revision: 2009 March 2009 FX35/FX50

Check the voltage between IPDM E/R harness connector and ground.

IPDM E/R		Ground	Voltage	
Connector	Terminal	Giodila	voltage	
E7	77	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 3. NO >> GO TO 10.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E3, F1
- Harness connectors F104, F105
- Harness for open or short between IPDM E/R and ECM

>> Repair open circuit, short to ground or short to power in harness or connectors.

4. CHECK FUEL PUMP POWER SUPPLY CIRCUIT-II

- 1. Turn ignition switch OFF.
- 2. Reconnect all harness connectors disconnected.
- 3. Disconnect "fuel level sensor unit and fuel pump (main)" harness connector.
- 4. Turn ignition switch ON.
- 5. Check the voltage between "fuel level sensor unit and fuel pump (main)" harness connector and ground.

Fuel level sensor unit and fuel pump (main)		Ground	Voltage	
Connector	Terminal	Giodila	voltage	
B22	1	Ground	Battery voltage should exist for 1 second after ignition switch is turned ON.	

Is the inspection result normal?

YES >> GO TO 8.

NO >> GO TO 5.

5. CHECK 15 A FUSE

- Turn ignition switch OFF.
- 2. Disconnect 15 A fuse (No. 41) from IPDM E/R.
- 3. Check 15 A fuse.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace 15 A fuse.

6.CHECK FUEL PUMP POWER SUPPLY CIRCUIT-IV

- 1. Disconnect IPDM E/R harness connector E5.
- 2. Check the continuity between IPDM E/R harness connector and "fuel level sensor unit and fuel pump (main)" harness connector.

IPDM	E/R	Fuel level sensor unit and fuel pump (main)		/main)		Continuity
Connector	Terminal	Connector Terminal				
E5	13	B22	1	Existed		

3. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 10.

NO >> GO TO 7.

1. DETECT MALFUNCTIONING PART

FUEL PUMP [VQ35HR] < DTC/CIRCUIT DIAGNOSIS > Check the following. Harness connectors E121, B3 Α IPDM E/R harness connector E5 Harness for open or short between IPDM E/R and "fuel level sensor unit and fuel pump (main)" EC >> Repair open circuit or short to power in harness or connectors. 8.CHECK FUEL PUMP GROUND CIRCUIT Turn ignition switch OFF. Check the continuity between "fuel level sensor unit and fuel pump (main)" harness connector and ground. D Fuel level sensor unit and fuel pump (main) Ground Continuity Е Connector Terminal B22 Ground Existed 3. Also check harness for short to power. F Is the inspection result normal? YES >> GO TO 9. NO >> Repair open circuit or short to power in harness or connectors. 9.CHECK FUEL PUMP Refer to EC-477, "Component Inspection". Н Is the inspection result normal? YES >> GO TO 10. NO >> Replace fuel pump. 10. CHECK INTERMITTENT INCIDENT Refer to GI-35, "Intermittent Incident". Is the inspection result normal? YES >> Replace IPDM E/R. NO >> Repair or replace harness or connectors. Component Inspection INFOID:0000000003856387 1. CHECK FUEL PUMP Turn ignition switch OFF. Disconnect "fuel level sensor unit and fuel pump (main)" harness connector. 2.

Check resistance between "fuel level sensor unit and fuel pump" terminals as follows.

Terminals	Resistance
1 and 3	0.2 - 5.0 Ω [at 25°C (77°F)]

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace "fuel level sensor unit and fuel pump"

EC-477 Revision: 2009 March 2009 FX35/FX50

M

N

ICC BRAKE SWITCH

Description

When the brake pedal is depressed, ICC brake switch is turned OFF and stop lamp switch is turned ON. ECM detects the state of the brake pedal by those two types of input (ON/OFF signal). Refer to CCS-24, "System Description" for the ICC function.

Component Function Check

INFOID:0000000003856389

1. CHECK ICC BRAKE SWITCH FUNCTION

(II) With CONSULT-III

- Turn ignition switch ON.
- Select "BRAKE SW1" in "DATA MONITOR" mode with CONSULT-III.
- Check "BRAKE SW1" indication under the following conditions.

Monitor item	Cor	Indication	
BRAKE SW1	Brake pedal	Slightly depressed	OFF
(ICC brake switch)	Diane pedal	Fully released	ON

⊗ Without CONSULT-III

- Turn ignition switch ON.
- Check the voltage between ECM harness connector terminals as follows.

ECM			Condition		
Connector + -		Voltage (V)			
Connector	Terminal	Terminal			
M107	126	128	Brake pedal	Slightly depressed	Approx. 0
IVITOT	(ICC brake switch signal)	120	Diake pedal	Fully released	Battery voltage

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-478, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003856390

CHECK DTC WITH ICC SENSOR INTEGRATED UNIT

Refer to CCS-44, "Diagnosis Description".

Are any DTCs detected?

YES >> Perform the Diagnosis Procedure corresponding to the detected DTC.

NO >> GO TO 2.

2.CHECK OVERALL FUNCTION

(I) With CONSULT-III

- 1. Turn ignition switch ON.
- Select "BRAKE SW1" in "DATA MONITOR" mode with CONSULT-III.
- Check "BRAKE SW1" indication under the following conditions.

Monitor item	Co	Indication	
BRAKE SW1	Brako podal	Slightly depressed	OFF
(ICC brake switch)	Brake pedal	Fully released	ON

⋈ Without CONSULT-III

- Turn ignition switch ON.
- 2. Check the voltage between ECM harness connector terminals under the following conditions.

ECM					
Connector	+	_	Condition		Voltage (V)
Connector	Terminal	Terminal			
M107	117	128	Brake pedal	Slightly depressed	Approx. 0
IVITOT	(ICC brake switch signal)	120	Біаке рецаі	Fully released	Battery voltage

EC

D

Е

F

Н

Ν

Α

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 3.

3.check icc brake switch power supply circuit-i

1. Turn ignition switch OFF.

- 2. Disconnect ICC brake switch harness connector.
- 3. Turn ignition switch ON.
- 4. Check the voltage between ICC brake switch harness connector and ground.

ICC brake switch		Ground	Voltage	
Connector	Terminal	Giodila	voitage	
E114	1	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 10. NO >> GO TO 4.

NO >> GO TO 4.

4. CHECK ICC BRAKE SWITCH POWER SUPPLY CIRCUIT-II

- 1. Turn ignition switch OFF.
- Disconnect ICC brake hold relay.
- 3. Turn ignition switch ON.
- 4. Check the voltage between ICC brake hold relay harness connector and ground.

ICC brake hold relay		Ground	Voltage	
Connector	Terminal	Giodila	voltage	
E91	3	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E103
- 10 A fuse (No. 3)
- · Harness for open or short between ICC brake hold relay and fuse

>> Repair open circuit or short to ground in harness or connectors.

6. CHECK ICC BRAKE SWITCH POWER SUPPLY CIRCUIT-III

- Turn ignition switch OFF.
- Check the continuity between ICC brake switch harness connector and ICC brake hold relay harness connector.

ICC brak	ICC brake switch		ICC brake hold relay	
Connector	Terminal	Connector Terminal		Continuity
E114	1	E91	4	Existed

Also check harness for short to ground and short to power.

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

7.CHECK ICC BRAKE HOLD RELAY CONTROL CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- 2. Disconnect brake booster control unit harness connector.
- Check the continuity between ICC brake hold relay harness connector and brake booster control unit harness connector.

ICC brake	ICC brake hold relay		Brake booster control unit	
Connector	Terminal	Connector Terminal		Continuity
E91	1	B249	47	Existed

4. Check the continuity between ICC brake hold relay harness connector and ground.

ICC brake	hold relay	Ground	Continuity	
Connector	Connector Terminal		Continuity	
E91 2		Ground	Existed	

5. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 9.

NO >> GO TO 8.

8. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E106, M6
- Harness connectors M117, B201
- · Harness for open or short between ICC brake hold relay and brake booster control unit
- Harness for open or short between ICC brake hold relay and ground

>> Repair open circuit, short to ground or short to power in harness or connectors.

9. CHECK ICC BRAKE HOLD RELAY

Refer to EC-1105, "Component Inspection (ICC Brake Hold Relay)".

Is the inspection result normal?

YES >> GO TO 13.

NO >> Replace ICC brake hold relay.

10. CHECK ICC BRAKE SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check the continuity between ICC brake switch harness connector and ECM harness connector.

ICC brake switch		ECM		Continuity
Connector	Terminal	Connector Terminal		Continuity
E114	2	M107	126	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 12.

NO >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check the following.

• Harness connectors E106, M6

ICC BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

·

>> Repair open circuit, short to ground or short to power in harness or connectors.

12. CHECK ICC BRAKE SWITCH

EC

D

Е

Н

K

Α

Refer to EC-481, "Component Inspection (ICC Brake Switch)".

· Harness for open or short between ICC brake switch and ECM

Is the inspection result normal?

YES >> GO TO 13.

NO >> Replace ICC brake switch.

13. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection (ICC Brake Switch)

INFOID:0000000003856391

1. CHECK ICC BRAKE SWITCH-I

F

- 1. Turn ignition switch OFF.
- 2. Disconnect ICC brake switch harness connector.
- Check the continuity between ICC brake switch terminals under the following conditions.

Terminals		Continuity	
1 and 2	Brake pedal	Fully released	Existed
	Brake pedar	Slightly depressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.CHECK ICC BRAKE SWITCH-II

Adjust ICC brake switch installation. Refer to <u>BR-7</u>, "Inspection and Adjustment".

2. Check the continuity between ICC brake switch terminals under the following conditions.

Terminals	C	Continuity	
1 and 2	nd 2 Brake pedal	Fully released	Existed
i aliu z		Slightly depressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace ICC brake switch.

Ν

O

IGNITION SIGNAL

Description

The ignition signal from the ECM is sent to and amplified by the power transistor. The power transistor turns ON and OFF the ignition coil primary circuit. This ON/OFF operation induces the proper high voltage in the coil secondary circuit.

Component Function Check

INFOID:0000000003856393

1.INSPECTION START

Turn ignition switch OFF, and restart engine.

Does the engine start?

YES-1 >> With CONSULT-III: GO TO 2.

YES-2 >> Without CONSULT-III: GO TO 3.

NO >> Go to <u>EC-482</u>, "<u>Diagnosis Procedure</u>".

2. CHECK IGNITION SIGNAL FUNCTION

(P)With CONSULT-III

- Perform "POWER BALANCE" in "ACTIVE TEST" mode with CONSULT-III.
- 2. Check that each circuit produces a momentary engine speed drop.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-482, "Diagnosis Procedure".

3.CHECK IGNITION SIGNAL FUNCTION

⋈ Without CONSULT-III

- 1. Let engine idle.
- Read the voltage signal between ECM harness connector terminals under the following conditions with an oscilloscope.

ECM				
+ -		Voltage signal		
Connector	Terminal	Connector Terminal		
	11			
	12			50mSec/div
E404	15	M407	400	
F101	16	M107	128	÷
	19			
	20			2V/div JMBIA0035GB

NOTE:

The pulse cycle changes depending on rpm at idle.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-482, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003856394

1. CHECK IGNITION COIL POWER SUPPLY CIRCUIT-I

- 1. Turn ignition switch OFF, wait at least 10 seconds and then turn it ON.
- Check the voltage between ECM harness connector terminals under the following conditions.

Connector	+	_	Voltage		
Connector	Terminal	Terminal			
M107	Battery voltage				
s the inspection result normal?					

EC

Е

Н

Ν

Р

Α

<u>Is the inspection result normal?</u>

YES >> GO TO 2.

NO >> Go to EC-144, "Diagnosis Procedure".

2.CHECK IGNITION COIL POWER SUPPLY CIRCUIT-II

- Turn ignition switch OFF.
- 2. Disconnect condenser harness connector.
- 3. Turn ignition switch ON.
- 4. Check the voltage between condenser harness connector and ground.

Condenser		Ground	Voltage	
Connector Terminal		Ground		
F8	1	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 3.

3.check ignition coil power supply circuit-iii

- Turn ignition switch OFF.
- 2. Disconnect IPDM E/R harness connector E7.
- 3. Check the continuity between IPDM E/R harness connector and condenser harness connector.

IPDM E/R		Cond	Continuity	
Connector	Terminal	Connector Terminal		Continuity
E7	53	F8	1	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> Go to EC-144, "Diagnosis Procedure".

NO >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E3, F1
- Harness for open or short between IPDM E/R and condenser

>> Repair open circuit, short to ground or short to power in harness or connectors.

${f 5.}$ CHECK CONDENSER GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- Check the continuity between condenser harness connector and ground.

Cond	enser	Ground	Continuity	
Connector	Connector Terminal		Continuity	
F8 2		Ground	Existed	

3. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair open circuit or short to power in harness or connectors.

Revision: 2009 March **EC-483** 2009 FX35/FX50

< DTC/CIRCUIT DIAGNOSIS >

6. CHECK CONDENSER

Refer to EC-486, "Component Inspection (Condenser)"

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace condenser.

7.CHECK IGNITION COIL POWER SUPPLY CIRCUIT-III

- 1. Reconnect all harness connectors disconnected.
- 2. Disconnect ignition coil harness connector.
- 3. Turn ignition switch ON.
- 4. Check the voltage between ignition coil harness connector and ground.

Ignition coil			Ground	Voltage		
Cylinder	Connector	Terminal	Giodila	voltage		
1	F11	3				
2	F12	3				
3	F13	3	Ground	Battery voltage		
4	F14	3	Giodila	battery voltage		
5	F15	3				
6	F16	3				

Is the inspection result normal?

YES >> GO TO 9.

NO >> GO TO 8.

8. DETECT MALFUNCTIONING PART

Check the following.

- Harness connector F1
- Harness for open or short between ignition coil and harness connector F1

>> Repair or replace harness or connectors.

$9.\mathsf{CHECK}$ IGNITION COIL GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Check the continuity between ignition coil harness connector and ground.

Ignition coil			Ground	Continuity	
Cylinder	Connector Terminal		Ground	Continuity	
1	F11	2			
2	F12	2		Existed	
3	F13	2	Ground		
4	F14	2	Giodila		
5	F15	2			
6	F16	2			

3. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair open circuit or short to power in harness or connectors.

10. CHECK IGNITION COIL OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Disconnect ECM harness connector.
- 2. Check the continuity between ignition coil harness connector and ECM harness connector.

Α

EC

Е

K

Ignition coil			EC	Continuity		
Cylinder	Connector	Terminal	Connector	Terminal	Continuity	
1	F11	1		20		
2	F12	1	F101	16		
3	F13	1		12	Existed	
4	F14	1		11	Existed	
5	F15	1		15		
6	F16	1		19		
 ΔIsο 	3 Also check harness for short to ground and short to now					

3. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 12.

NO >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F104, F105
- · Harness for open or short between ignition coil and ECM

>> Repair open circuit, short to ground or short to power in harness or connectors.

12. CHECK IGNITION COIL WITH POWER TRANSISTOR

Refer to EC-485, "Component Inspection (Ignition Coil with Power Transistor)".

Is the inspection result normal?

YES >> GO TO 13.

NO >> Replace malfunctioning ignition coil with power transistor.

13. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection (Ignition Coil with Power Transistor)

1. CHECK IGNITION COIL WITH POWER TRANSISTOR-I

- Turn ignition switch OFF.
- 2. Disconnect ignition coil harness connector.
- 3. Check resistance between ignition coil terminals as follows.

Terminals	Resistance [at 25°C (77°F)]	
1 and 2	Except 0 or ∞Ω	
1 and 3	Except 0 Ω	
2 and 3	Ελοθρί ο 32	

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace malfunctioning ignition coil with power transistor.

2. CHECK IGNITION COIL WITH POWER TRANSISTOR-II

CAUTION:

Perform the following procedure in a place with no combustible objects and good ventilation.

- Turn ignition switch OFF.
- Reconnect all harness connectors disconnected.

Revision: 2009 March **EC-485** 2009 FX35/FX50

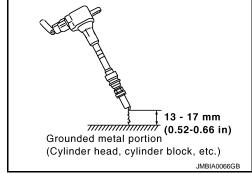
< DTC/CIRCUIT DIAGNOSIS >

3. Remove fuel pump fuse (1) in IPDM E/R (2) to release fuel pressure.

NOTE:

Do not use CONSULT-III to release fuel pressure, or fuel pressure applies again during the following procedure.

- Start engine.
- After engine stalls, crank it 2 or 3 times to release all fuel pressure.
- 6. Turn ignition switch OFF.
- 7. Remove all ignition coil harness connectors to avoid the electrical discharge from the ignition coils.
- 8. Remove ignition coil and spark plug of the cylinder to be checked.
- 9. Crank engine for 5 seconds or more to remove combustion gas in the cylinder.
- 10. Connect spark plug and harness connector to ignition coil.
- 11. Fix ignition coil using a rope etc. with gap of 13 17 mm (0.52 0.66 in) between the edge of the spark plug and grounded metal portion as shown in the figure.
- 12. Crank engine for approximately 3 seconds, and check whether spark is generated between the spark plug and the grounded metal portion.



Spark should be generated.

CAUTION:

- Never place to the spark plug and the ignition coil within 50 cm (19.7 in). Be careful not to get an electrical shock while checking, because the electrical discharge voltage becomes 20 kV or more.
- It might damage the ignition coil if the gap of more than 17 mm (0.66 in) is made.

When the gap is less than 13 mm (0.52 in), a spark might be generated even if the coil is malfunctioning.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace malfunctioning ignition coil with power transistor.

Component Inspection (Condenser)

INFOID:0000000003856396

1. CHECK CONDENSER

- Turn ignition switch OFF.
- Disconnect condenser harness connector.
- 3. Check resistance between condenser terminals as follows.

Terminals	Resistance
1 and 2	Above 1 M Ω [at 25°C (77°F)]

Is the inspection result normal?

YES >> INSPECTION END NO >> Replace condenser.

INFORMATION DISPLAY (ASCD)

[VQ35HR] < DTC/CIRCUIT DIAGNOSIS >

INFORMATION DISPLAY (ASCD)

Description INFOID:0000000004072219

The ASCD operation status is indicated by two indicators (CRUISE and SET on the information display) on the combination meter.

CRUISE indicator is displayed to indicated that ASCD system is ready for operation when MAIN switch on ASCD steering switch is turned ON.

SET indicator is displayed when the following conditions are met.

- CRUISE indicator is displayed.
- SET/COAST switch on ASCD steering switch is turned ON while vehicle speed is within the range of the ASCD setting. The set speed is also displayed on the information display.

SET indicator is displayed during ASCD control.

When the canceling conditions come into effect, the CRUISE and SET indications on the information display disappear.

Component Function Check

1. CHECK INFORMATION DISPLAY

- 1. Start engine.
- Press MAIN switch on ASCD steering switch.
- 3. Drive the vehicle at more than 40 km/h (25 MPH) **CAUTION:**

Always drive vehicle at a safe speed.

- Press SET/COAST switch.
- 5. Check that the readings of the speedometer show the same values as the set speed indicated in the information display while driving the vehicle on a flat road.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-487, "Diagnosis Procedure".

Diagnosis Procedure

1.CHECK DTC

Check that DTC UXXXX, P0500 or P1574 is not displayed.

Is the inspection result normal?

>> GO TO 2. YES

NO-1 >> Perform trouble diagnosis for DTC UXXXX.

NO-2 >> Perform trouble diagnosis for DTC P0500. Refer to <u>EC-348</u>. "<u>Diagnosis Procedure</u>".

NO-3 >> Perform trouble diagnosis for DTC P1574. Refer to EC-437, "Diagnosis Procedure".

2.CHECK DTC WITH "UNITIED MATER & A/C AMP."

Refer to MWI-45, "CONSULT-III Function (METER/M&A)".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Perform trouble diagnosis relevant to DTC indicated.

3.CHECK INTERMITTENT INCIDENT

Refer to GI-35. "Intermittent Incident".

Is the inspection result normal?

YES >> Replace combination meter.

NO >> Repair or replace.

EC-487 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

INFOID:0000000004072220

INFOID:000000000407222

M

N

MALFUNCTION INDICATOR LAMP

Description

The Malfunction Indicator Lamp (MIL) is located on the combination meter.

The MIL will illuminate when the ignition switch is turned ON without the engine running. This is a bulb check.

When the engine is started, the MIL should turn off. If the MIL remains illuminated, the on board diagnostic system has detected an engine system malfunction.

For details, refer to EC-111, "Diagnosis Description".



Component Function Check

INFOID:0000000003856398

1.CHECK MALFUNCTION INDICATOR LAMP (MIL) FUNCTION

- 1. Turn ignition switch ON.
- 2. Check that MIL illuminates.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-488, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003856399

1.CHECK DTC

Check that DTC UXXXX is not displayed.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Perform trouble diagnosis for DTC UXXXX.

2.CHECK DTC WITH "UNIFIED METER AND A/C AMP."

Refer to MWI-45, "CONSULT-III Function (METER/M&A)".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace malfunctioning part.

3. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

Is the inspection result normal?

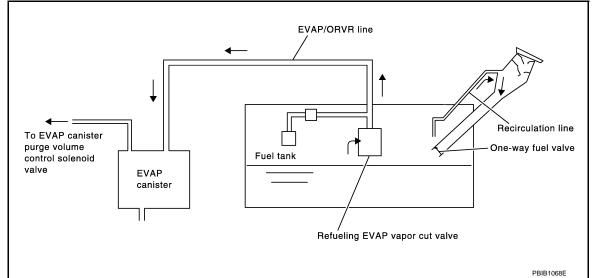
YES >> Replace combination meter.

NO >> Repair or replace malfunctioning part.

ON BOARD REFUELING VAPOR RECOVERY (ORVR)

Description

INFOID:0000000003856400



From the beginning of refueling, the air and vapor inside the fuel tank go through refueling EVAP vapor cut valve and EVAP/ORVR line to the EVAP canister. The vapor is absorbed by the EVAP canister and the air is released to the atmosphere.

When the refueling has reached the full level of the fuel tank, the refueling EVAP vapor cut valve is closed and refueling is stopped because of auto shut-off. The vapor which was absorbed by the EVAP canister is purged during driving.

WARNING:

When conducting inspections below, be sure to observe the following:

- Put a "CAUTION: FLAMMABLE" sign in workshop.
- Never smoke while servicing fuel system. Keep open flames and sparks away from work area.
- Always furnish the workshop with a CO₂ fire extinguisher.

CAUTION:

- Before removing fuel line parts, carry out the following procedures:
- Put drained fuel in an explosion-proof container and put lid on securely.
- Release fuel pressure from fuel line. Refer to <u>EC-567</u>, "Inspection".
- Disconnect battery ground cable.
- Always replace O-ring when the fuel gauge retainer is removed.
- Never kink or twist hose and tube when they are installed.
- Never tighten hose and clamps excessively to avoid damaging hoses.
- After installation, run engine and check for fuel leaks at connections.
- Never attempt to top off the fuel tank after the fuel pump nozzle shuts off automatically. Continued refueling may cause fuel overflow, resulting in fuel spray and possibly a fire.

Component Function Check

INFOID:0000000003856401

1. CHECK ORVE FUNCTION

Check whether the following symptoms are present.

- Fuel odor from EVAP canister is strong.
- Cannot refuel/Fuel odor from the fuel filler opening is strong while refueling.

Are any symptoms present?

>> Go to EC-489, "Diagnosis Procedure". YES

>> INSPECTION END NO

Diagnosis Procedure 1.INSPECTION START

Check whether the following symptoms are present.

A: Fuel odor from EVAP canister is strong.

EC-489 Revision: 2009 March 2009 FX35/FX50

EC

Α

Е

N

INFOID:0000000003856402

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

B: Cannot refuel/Fuel odor from the fuel filler opening is strong while refueling.

Which symptom is present?

- A >> GO TO 2.
- B >> GO TO 7.

2. CHECK EVAP CANISTER

- 1. Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
- Weigh the EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.

The weight should be less than 2.1 kg (4.6 lb).

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 4.

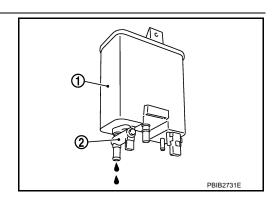
3. CHECK IF EVAP CANISTER IS SATURATED WITH WATER

Check if water will drain from EVAP canister (1).

2 : EVAP canister vent control valve

Does water drain from the EVAP canister?

YES >> GO TO 4. NO >> GO TO 6.



4. REPLACE EVAP CANISTER

Replace EVAP canister with a new one.

>> GO TO 5.

5.DETECT MALFUNCTIONING PART

Check the EVAP hose between EVAP canister and vehicle frame for clogging or poor connection.

>> Repair or replace EVAP hose.

6. CHECK REFUELING EVAP VAPOR CUT VALVE

Refer to EC-492, "Component Inspection".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace refueling EVAP vapor cut valve with fuel tank.

7. CHECK EVAP CANISTER

- Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
- 2. Weigh the EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.

The weight should be less than 2.1 kg (4.6 lb).

Is the inspection result normal?

YES >> GO TO 8. NO >> GO TO 9.

8. CHECK IF EVAP CANISTER IS SATURATED WITH WATER

< DTC/CIRCUIT DIAGNOSIS >

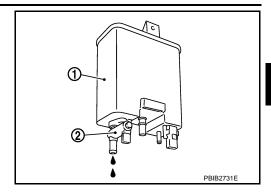
[VQ35HR]

Check if water will drain from EVAP canister (1).

2 : EVAP canister vent control valve

Does water drain from the EVAP canister?

YES >> GO TO 9. NO >> GO TO 11.



9. REPLACE EVAP CANISTER

Replace EVAP canister with a new one.

>> GO TO 10.

10.DETECT MALFUNCTIONING PART

Check the EVAP hose between EVAP canister and vehicle frame for clogging or poor connection.

>> Repair or replace EVAP hose.

11. CHECK VENT HOSES AND VENT TUBES

Check hoses and tubes between EVAP canister and refueling control valve for clogging, kinks, looseness and improper connection.

Is the inspection result normal?

YES >> GO TO 12.

NO >> Repair or replace hoses and tubes.

12. CHECK FILLER NECK TUBE

Check recirculation line for clogging, dents and cracks.

Is the inspection result normal?

YES >> GO TO 13.

NO >> Replace filler neck tube.

13. CHECK REFUELING EVAP VAPOR CUT VALVE

Refer to EC-492, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 14.

NO >> Replace refueling EVAP vapor cut valve with fuel tank.

14. CHECK FUEL FILLER TUBE

Check filler neck tube and hose connected to the fuel tank for clogging, dents and cracks.

Is the inspection result normal?

YES >> GO TO 15.

NO >> Replace fuel filler tube.

15. CHECK ONE-WAY FUEL VALVE-I

Check one-way valve for clogging.

Is the inspection result normal?

YES >> GO TO 16.

>> Repair or replace one-way fuel valve with fuel tank.

16.CHECK ONE-WAY FUEL VALVE-II

- Check that fuel is drained from the tank.
- Remove fuel filler tube and hose.

Α

EC

Е

D

N

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

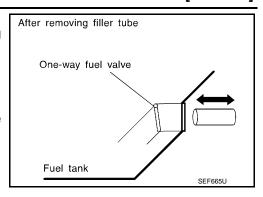
Check one-way fuel valve for operation as follows.
 When a stick is inserted, the valve should open, when removing stick it should close.

Do not drop any material into the tank.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace fuel filler tube or replace one-way fuel valve with fuel tank.



INFOID:0000000003856403

Component Inspection

1.INSPECTION START

Will CONSULT-III be used?

Will CONSULT-III be used?

YES >> GO TO 2. NO >> GO TO 3.

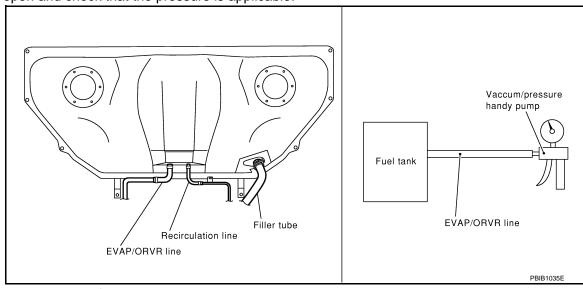
2.CHECK REFUELING EVAP VAPOR CUT VALVE

(II) With CONSULT-III

- 1. Turn ignition switch OFF.
- 2. Remove fuel tank. Refer to FL-10, "Removal and Installation".
- 3. Drain fuel from the tank as follows:
- Remove fuel feed hose located on the fuel gauge retainer.
- Connect a spare fuel hose, one side to fuel gauge retainer where the hose was removed and the other side to a fuel container.
- Drain fuel using "FUEL PUMP RELAY" in "ACTIVE TEST" mode with CONSULT-III.
- 4. Check refueling EVAP vapor cut valve for being stuck to close as follows. Blow air into the refueling EVAP vapor cut valve (from the end of EVAP/ORVR line hose), and check that the air flows freely into the tank.
- 5. Check refueling EVAP vapor cut valve for being stuck to open as follows.
- Connect vacuum pump to hose end.
- Remove fuel gauge retainer with fuel gauge unit.

Always replace O-ring with new one.

- Turn fuel tank upside down.
- Apply vacuum pressure to hose end [-13.3 kPa (-0.136 kg/cm³, -1.93 psi)] with fuel gauge retainer remaining open and check that the pressure is applicable.



Is the inspection result normal?

YES >> INSPECTION END

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

NO >> Replace refueling EVAP vapor cut valve with fuel tank.

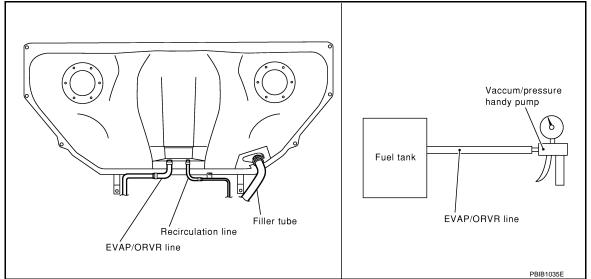
3.check refueling evap vapor cut valve

Without CONSULT-III

- 1. Turn ignition switch OFF.
- Remove fuel tank. Refer to FL-10, "Removal and Installation".
- 3. Drain fuel from the tank as follows:
- Remove fuel gauge retainer.
- Drain fuel from the tank using a handy pump into a fuel container.
- 4. Check refueling EVAP vapor cut valve for being stuck to close as follows. Blow air into the refueling EVAP vapor cut valve (from the end of EVAP/ORVR line hose), and check that the air flows freely into the tank.
- 5. Check refueling EVAP vapor cut valve for being stuck to open as follows.
- Connect vacuum pump to hose end.
- Remove fuel gauge retainer with fuel gauge unit.

Always replace O-ring with new one.

- Turn fuel tank upside down.
- Apply vacuum pressure to hose end [-13.3 kPa (-0.136 kg/cm³, -1.93 psi)] with fuel gauge retainer remaining open and check that the pressure is applicable.



Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace refueling EVAP vapor cut valve with fuel tank.

EC

Α

D

Е

F

Н

K

IV /

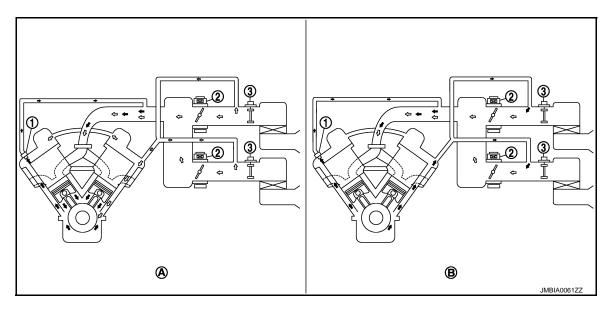
L

Ν

0

POSITIVE CRANKCASE VENTILATION

Description INFOID:000000003856404



- PCV valve
- A. Normal condition
- <⊟: Fresh air
- Elow-by air

- 2. Electric throttle control actuator
- B. Hi-load condition
- Mass air flow sensor

This system returns blow-by gas to the intake manifold.

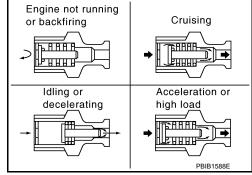
The positive crankcase ventilation (PCV) valve is provided to conduct crankcase blow-by gas to the intake manifold.

During partial throttle operation of the engine, the intake manifold sucks the blow-by gas through the PCV valve.

Normally, the capacity of the valve is sufficient to handle any blow-by and a small amount of ventilating air. The ventilating air is drawn from the air inlet tubes into the crankcase. In this process the air passes through the hose connecting air inlet tubes to rocker cover.

Under full-throttle condition, the manifold vacuum is insufficient to draw the blow-by flow through the valve. The flow goes through the hose connection in the reverse direction.

On vehicles with an excessively high blow-by, the valve does not meet the requirement. This is because some of the flow will go through the hose connection to the air inlet tubes under all conditions.



Component Inspection

INFOID:0000000003856405

1. CHECK POSITIVE CRANKCASE VENTILATION (PCV) VALVE

POSITIVE CRANKCASE VENTILATION

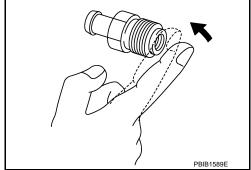
< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

With engine running at idle, remove PCV valve from rocker cover. A properly working valve makes a hissing noise as air passes through it. A strong vacuum should be felt immediately when a finger is placed over valve inlet.

Is the inspection result normal?

YES >> INSPECTION END NO >> Replace PCV valve.



Α

EC

С

D

Е

F

G

Н

K

L

M

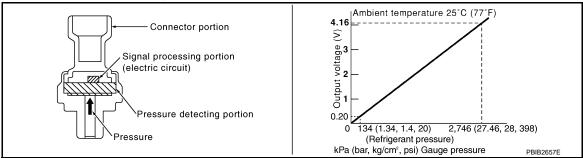
Ν

0

REFRIGERANT PRESSURE SENSOR

Description INFOID:000000003856406

The refrigerant pressure sensor is installed at the condenser of the air conditioner system. The sensor uses an electrostatic volume pressure transducer to convert refrigerant pressure to voltage. The voltage signal is sent to ECM, and ECM controls cooling fan system.



Component Function Check

INFOID:0000000003856407

1. CHECK REFRIGERANT PRESSURE SENSOR FUNCTION

- 1. Start engine and warm it up to normal operating temperature.
- Turn A/C switch and blower fan switch ON.
- 3. Check the voltage between ECM harness connector terminals under the following conditions.

Connector	+	_	Voltage (V)
Connector	Terminal	Terminal	
M107	105 (Refrigerant pressure sensor signal)	116	1.0 - 4.0

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-496, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003856408

1. CHECK GROUND CONNECTION

- 1. Turn A/C switch and blower fan switch OFF.
- 2. Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2. CHECK REFRIGERANT PRESSURE SENSOR POWER SUPPLY CIRCUIT

- 1. Disconnect refrigerant pressure sensor harness connector.
- Turn ignition switch ON.
- 3. Check the voltage between refrigerant pressure sensor harness connector and ground.

Refrigerant pressure sensor		Ground	Voltage (V)
Connector	Terminal	Ground	voltage (v)
E77	3	Ground	Approx. 5

Is the inspection result normal?

YES >> GO TO 4. NO >> GO TO 3.

Revision: 2009 March **EC-496** 2009 FX35/FX50

REFRIGERANT PRESSURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

3.DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M6, E106
- Harness for open or short between ECM and refrigerant pressure sensor

EC

>> Repair open circuit, short to ground or short to power in harness or connectors.

f 4.CHECK REFRIGERANT PRESSURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check the continuity between refrigerant pressure sensor harness connector and ECM harness connec-

Refrigerant pre	Refrigerant pressure sensor		CM	Continuity
Connector	Terminal	Connector	Terminal	Continuity
E77	1	M107	116	Existed

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 6. NO >> GO TO 5.

DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M6, E106
- Harness for open or short between ECM and refrigerant pressure sensor

>> Repair open circuit, short to ground or short to power in harness or connectors.

6.CHECK REFRIGERANT PRESSURE SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

Check the continuity between refrigerant pressure sensor harness connector and ECM harness connector.

Refrigerant pre	pressure sensor ECM		Continuity	
Connector	Terminal	Connector	Terminal	Continuity
E77	2	M107	105	Existed

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 8. NO >> GO TO 7.

7.DETECT MALFUNCTIONING PART

Check the following.

Revision: 2009 March

- Harness connectors M6, E106
- Harness for open or short between ECM and refrigerant pressure sensor

>> Repair open circuit, short to ground or short to power in harness or connectors.

8. CHECK INTERMITTENT INCIDENT

Refer to GI-35. "Intermittent Incident".

Is the inspection result normal?

YES >> Replace refrigerant pressure sensor.

>> Repair or replace malfunctioning part. NO

EC-497

D

Е

K

Ν

SNOW MODE SWITCH

Description INFOID.000000003856409

The snow mode switch signal is sent to the "unified meter and A/C amp." from the snow mode switch. The "unified meter and A/C amp." then sends the signal to the ECM by CAN communication line.

The snow mode is used for driving or starting the vehicle on snowy roads or slippery areas. If the snow mode is activated, the vehicle speed will not accelerator as quickly as normal to avoid vehicle slip. In other words, ECM controls rapid engine torque change by controlling the electric throttle control actuator operating speed.

Component Function Check

INFOID:0000000003856410

1. CHECK SNOW MODE SWITCH FUNCTION

- 1. Turn ignition switch ON.
- 2. Select "SNOW MODE SW" in "DATA MONITOR" mode with CONSULT-III.
- 3. Check "SNOW MODE SW" indication under the following conditions.

Monitor item	Condition		Indication
SNOW MODE SW	Snow mode switch	ON	ON
SNOW WODE SW	Show mode switch	OFF	OFF

Is the inspection result normal?

YES >> GO TO 2.

NO >> Go to EC-498, "Diagnosis Procedure".

2.check snow mode indicator function

- 1. Turn ignition switch ON.
- 2. Check the snow mode indicator in the snow mode switch under the following condition.

Condition		Snow mode indicator
Snow mode switch	ON	ON
Show mode switch	OFF	OFF

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-498, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003856411

1. CHECK SNOW MODE SWITCH OVERALL FUNCTION

Confirm the malfunctioning circuit (snow mode switch or snow mode indicator). Refer to <u>EC-498</u>, "Component <u>Function Check"</u>.

Which circuit is related to the incident?

Snow mode switch>>GO TO 2.

Snow mode indicator>>GO TO 6.

2.CHECK DTC WITH "UNIFIED METER AND A/C AMP."

Refer to MWI-45, "CONSULT-III Function (METER/M&A)".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Go to MWI-4. "Work flow".

3.check snow mode switch power supply circuit

- Turn ignition switch OFF.
- 2. Disconnect snow mode switch harness connector.
- Turn ignition switch ON.
- 4. Check the voltage between snow mode switch harness connector and ground.

				_	
Snow mo	ode switch	Ground	Voltage		Α
Connector	Terminal			_	
M176	1	Ground	Battery voltage	_	EC
Is the inspe					
	> GO TO 5 > GO TO 4				
4.DETEC			2 DADT		С
		NC HOMING	J PAN I		
Check theHarness		s F106 M6	3		
 IPDM E/I 	R harness				
• 10 A fuse		r chart hat	woon chow m	ado quitab and fusa	_
• паптеза	ioi opeii oi	Short bett	ween snow m	ode switch and fuse.	E
>:	> Repair or	en circuit	short to arou	nd or short to power in harness or connectors.	
_			•	GNAL CIRCUIT FOR OPEN AND SHORT	F
				GIVIE GIRGOTT FOR OF EIGHTING GRORT	
	gnition switen nect "unific		nd A/C amp."	harness connector.	
3. Check	the contin	uity betwe		le switch harness connector and "unified meter and A/C ar	mp."
harnes	ss connecto	or.			
Casuma	مام میں نام	Unified meet	ar and A/C area		H
Snow mod			er and A/C amp.	Continuity	
Connector M176	Terminal 4	Connector M66	Terminal 23	Existed	
				nd short to power.	
Is the inspe			t to ground ar	a short to power.	
	> GO TO 8				J
			short to groun	nd or short to power in harness or connector.	
6.CHECK	GROUND	CONNEC	TION		
1. Turn ic	gnition swit	ch OFF.			K
			195. Refer to (Ground Inspection in GI-38, "Circuit Inspection".	
Is the inspe	ection resu	<u>lt normal?</u>			L
	> GO TO 7			·	
	•		round connec		
				GROUND CIRCUIT FOR OPEN AND SHORT	N
1. Check	the contin	uity betwee	en snow mode	switch harness connector and ground.	
					1
Snow mod		Ground	Continuity		I'
Connector	Terminal				
N/47C		O	Endada d		

2. Also check harness for short to power.

Ground

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair open circuit or short to power in harness or connectors.

Existed

8. CHECK SNOW MODE SWITCH

Refer to EC-500, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace snow mode switch.

Revision: 2009 March EC-499 2009 FX35/FX50

SNOW MODE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VQ35HR]

9. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000003856412

1. CHECK SNOW MODE SWITCH-I

- 1. Turn ignition switch OFF.
- 2. Disconnect snow mode switch harness connector.
- 3. Check the continuity between snow mode switch terminals under the following conditions.

Terminals	Condition		Continuity
1 and 4	Snow mode switch	ON	Existed
i aliu 4	Show mode switch	OFF	Not Existed

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace snow mode switch.

2. CHECK SNOW MODE SWITCH-II

Check the continuity between snow mode switch terminals under the following conditions.

Terminals (Polarity)	Continuity
2 (+) - 4 (-)	Existed
4 (+) - 2 (–)	Not Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace snow mode switch.

Α

D

Е

F

Н

K

L

M

Ν

Р

ECU DIAGNOSIS INFORMATION

ECM

Reference Value

VALUES ON THE DIAGNOSIS TOOL

NOTE:

- · Specification data are reference values.
- Specification data are output/input values which are detected or supplied by the ECM at the connector.
- * Specification data may not be directly related to their components signals/values/operations.
 i.e. Adjust ignition timing with a timing light before monitoring IGN TIMING, because the monitor may show the specification data in spite of the ignition timing not being adjusted to the specification data. This IGN TIMING monitors the data calculated by the ECM according to the signals input from the camshaft position sen-

sor and other ignition timing related sensors.

CONSULT-III MONITOR ITEM

Monitor Item	Co	ondition	Values/Status		
ENG SPEED	Run engine and compare CONSULT-III value with the tachometer indication.		Almost the same speed as the tachometer indication		
MAS A/F SE-B1	See EC-136, "Description".				
MAS A/F SE-B2	See EC-136, "Description".				
B/FUEL SCHDL	See EC-136, "Description".	See EC-136, "Description".			
A/F ALPHA-B1	See EC-136, "Description".	See EC-136, "Description".			
A/F ALPHA-B2	See EC-136, "Description".				
COOLAN TEMP/S	Ignition switch: ON		Indicates engine coolant temperature		
VF SEN1 (B1)	Engine: After warming up	Maintaining engine speed at 2,000 rpm	Fluctuates around 2.2 V		
VF SEN1 (B2)	Engine: After warming up	Maintaining engine speed at 2,000 rpm	Fluctuates around 2.2 V		
HO2S2 (B1)	met Engine: After warming up	om quickly after the following conditions are en 3,500 and 4,000 rpm for 1 minute and at	0 - 0.3 V ←→ Approx. 0.6 - 1.0 V		
HO2S2 (B2)	 Revving engine from idle to 3,000 rpm quickly after the following conditions are met. Engine: After warming up After keeping engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load 		0 - 0.3 V ←→ Approx. 0.6 - 1.0 V		
HO2S2 MNTR (B1)	 Revving engine from idle to 3,000 rpm quickly after the following conditions are met. Engine: After warming up After keeping engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load 		$LEAN \longleftrightarrow RICH$		
HO2S2 MNTR (B2)	 Revving engine from idle to 3,000 rpm quickly after the following conditions are met. Engine: After warming up After keeping engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load 		$LEAN \longleftrightarrow RICH$		
VHCL SPEED SE	Turn drive wheels and compare CONSULT-III value with the speedometer indication.		Almost the same speed as speedometer indication		
BATTERY VOLT	Ignition switch: ON (Engine stopped)		11 - 14 V		
ACCEL SEN 1	Ignition switch: ON	Accelerator pedal: Fully released	0.45 - 1.0 V		
ACCEL SEN 1	(Engine stopped)	Accelerator pedal: Fully depressed	4.4 - 4.8 V		
00EL 0EN 0±1	Ignition switch: ON	Accelerator pedal: Fully released	0.45 - 1.0 V		
ACCEL SEN 2*1	(Engine stopped)	Accelerator pedal: Fully depressed	4.4 - 4.8 V		

Monitor Item	Condition		Values/Status
TP SEN 1-B1	Ignition switch: ON (Engine stopped) Selector lever: D	Accelerator pedal: Fully released	More than 0.36 V
		Accelerator pedal: Fully depressed	Less than 4.75 V
_	Ignition switch: ON	Accelerator pedal: Fully released	More than 0.36 V
TP SEN 2-B1*1	(Engine stopped)Selector lever: D	Accelerator pedal: Fully depressed	Less than 4.75 V
FUEL T/TMP SE	Ignition switch: ON		Indicates fuel tank tempera ture
INT/A TEMP SE	Ignition switch: ON		Indicates intake air temperature
EVAP SYS PRES	Ignition switch: ON		Approx. 1.8 - 4.8 V
FUEL LEVEL SE	Ignition switch: ON		Depending on fuel level of fuel tank
START SIGNAL	• Ignition switch: $ON \rightarrow START \rightarrow Ol$	switch: $ON \rightarrow START \rightarrow ON$	
	Ignition switch: ON	Accelerator pedal: Fully released	ON
CLSD THL POS	(Engine stopped)	Accelerator pedal: Slightly depressed	OFF
_	Engine: After warming up, idle the engine	Air conditioner switch: OFF	OFF
AIR COND SIG		Air conditioner switch: ON (Compressor operates.)	ON
D/NI DOCL CW/	a Ignitian quitabi ON	Selector lever: P or N	ON
P/N POSI SW	Ignition switch: ON	Selector lever: Except above	OFF
DIALICT CLONIAL	Engine: After warming up, idle the engine	Steering wheel: Not being turned	OFF
PW/ST SIGNAL		Steering wheel: Being turned	ON
LOAD SIGNAL	Ignition switch: ON	Rear window defogger switch: ON and/or Lighting switch: 2nd position	ON
		Rear window defogger switch and lighting switch: OFF	OFF
IGNITION SW	• Ignition switch: $ON \rightarrow OFF \rightarrow ON$		$ON \to OFF \to ON$
	Engine: After warming up, idle the engine	Heater fan switch: ON	ON
HEATER FAN SW		Heater fan switch: OFF	OFF
DDAKE OW	Ignition switch: ON	Brake pedal: Fully released	OFF
BRAKE SW		Brake pedal: Slightly depressed	ON
INJ PULSE-B1	Engine: After warming up	Idle	2.0 - 3.0 msec
	Selector lever: P or NAir conditioner switch: OFFNo load	2,000 rpm	1.9 - 2.9 msec
	Engine: After warming up Selector lever: P or N Air conditioner switch: OFF No load	Idle	2.0 - 3.0 msec
INJ PULSE-B2		2,000 rpm	1.9 - 2.9 msec
IGN TIMING	Engine: After warming up Selector lever: P or N Air conditioner switch: OFF No load	Idle	6° - 16° BTDC (With 4WAS 10° - 20° BTDC (Without 4WAS)
		2,000 rpm	25° - 45° BTDC
CAL/LD VALUE	Engine: After warming up	Idle	5% - 35%
	Selector lever: P or NAir conditioner switch: OFFNo load	2,500 rpm	5% - 35%

Monitor Item	Co	ondition	Values/Status
MASS AIRFLOW	Engine: After warming up Selector lever: P or N Air conditioner switch: OFF	Idle 2,500 rpm	2.0 - 6.0 g·m/s 7.0 - 20.0 g·m/s
PURG VOL C/V	No load Engine: After warming up Selector lever: P or N Air conditioner switch: OFF No load	Idle (Accelerator pedal: Not depressed even slightly, after engine starting.)	0%
		2,000 rpm	_
INT/V TIM (B1)	 Engine: After warming up Selector lever: P or N Air conditioner switch: OFF No load 	Idle	–5° - 5°CA
		2,000 rpm	Approx. 0° - 30°CA
	Engine: After warming up Selector lever: P or N Air conditioner switch: OFF No load	Idle	−5° - 5°CA
INT/V TIM (B2)		2,000 rpm	Approx. 0° - 30°CA
	Engine: After warming up	Idle	–5° - 5°CA
EXH/V TIM B1	Selector lever: P or NAir conditioner switch: OFFNo load	Around 2,500 rpm while the engine speed is rising	Approx. 0° - 30°CA
	Engine: After warming up	Idle	–5° - 5°CA
EXH/V TIM B2	Selector lever: P or NAir conditioner switch: OFFNo load	Around 2,500 rpm while the engine speed is rising	Approx. 0° - 30°CA
	Engine: After warming up	Idle	0% - 2%
INT/V SOL (B1)	Selector lever: P or NAir conditioner switch: OFFNo load	2,000 rpm	Approx. 0% - 50%
INT/V SOL (B2)	Engine: After warming up Selector lever: P or N Air conditioner switch: OFF No load	Idle	0% - 2%
		2,000 rpm	Approx. 0% - 50%
	Engine: After warming up Selector lever: P or N Air conditioner switch: OFF No load	Idle	0% - 2%
VTC DTY EX B1		Around 2,500 rpm while the engine speed is rising	Approx. 0% - 70%
	 Engine: After warming up Selector lever: P or N Air conditioner switch: OFF No load 	Idle	0% - 2%
VTC DTY EX B2		Around 2,500 rpm while the engine speed is rising	Approx. 0% - 70%
TP SEN 1-B2	Ignition switch: ON (Engine stopped) Selector lever: D	Accelerator pedal: Fully released	More than 0.36 V
		Accelerator pedal: Fully depressed	Less than 4.75 V
TP SEN 2-B2*1	Ignition switch: ON (Engine stopped) Selector lever: D	Accelerator pedal: Fully released	More than 0.36 V
		Accelerator pedal: Fully depressed	Less than 4.75 V
AIR COND RLY	Engine: After warming up, idle the engine	Air conditioner switch: OFF	OFF
		Air conditioner switch: ON (Compressor operates)	ON
FUEL PUMP RLY	 For 1 second after turning ignition switch: ON Engine running or cranking 		ON
	Except above		OFF
VENT CONT/V	Ignition switch: ON		OFF
THRTL RELAY	Ignition switch: ON		ON

Monitor Item		Condition	Values/Status
HO2S2 HTR (B1)	 Engine speed: Below 3,600 rpm after the following conditions are met. Engine: After warming up Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load 		ON
	Engine speed: Above 3,600 rpm		OFF
HO2S2 HTR (B2)	 Engine speed: Below 3,600 rpm after the following conditions are met. Engine: After warming up Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load 		ON
	Engine speed: Above 3,600 rpm		OFF
I/P PULLY SPD	Vehicle speed: More than 20 km/h	Vehicle speed: More than 20 km/h (12 MPH)	
VEHICLE SPEED	Turn drive wheels and compare Contaction.	Turn drive wheels and compare CONSULT-III value with the speedometer indication.	
IDL A/V LEARN	Engine: Running	Idle air volume learning has not been performed yet.	YET
		Idle air volume learning has already been performed successfully.	CMPLT
SNOW MODE SW	Ignition switch: ON	Snow mode switch: ON	ON
SNOW MODE SW	Ignition Switch. ON	Snow mode switch: OFF	OFF
ENG OIL TEMP	Engine: After warming up	• Engine: After warming up	
TRVL AFTER MIL	Ignition switch: ON	Vehicle has traveled after MIL has illuminated.	0 - 65,535 km (0 - 40,723 miles)
A/F S1 HTR (B1)		 Engine: After warming up, idle the engine (More than 140 seconds after starting engine) 	
A/F S1 HTR (B2)	 Engine: After warming up, idle the engine (More than 140 seconds after starting engine) 		4 - 100%
AC PRESS SEN	Engine: IdleBoth A/C switch and blower fan sv	 Engine: Idle Both A/C switch and blower fan switch: ON (Compressor operates) 	
VHCL SPEED SE	 Turn drive wheels and compare CONSULT-III value with the speedometer indi- cation. 		Almost the same speed as the speedometer indication
SET VHCL SPD	Engine: Running	ASCD: Operating	The preset vehicle speed is displayed
MAIN SW	Ignition switch: ON	MAIN switch: Pressed	ON
		MAIN switch: Released	OFF
CANCEL SW	Ignition switch: ON	CANCEL switch: Pressed	ON
		CANCEL switch: Released	OFF
RESUME/ACC SW	Ignition switch: ON	RESUME/ACCELERATE switch: Pressed	ON
		RESUME/ACCELERATE switch: Released	OFF
SET SW	Ignition switch: ON	SET/COAST switch: Pressed	ON
		SET/COAST switch: Released	OFF
BRAKE SW1 (ICC/ASCD brake	Ignition switch: ON	Brake pedal: Fully released	ON
switch)		Brake pedal: Slightly depressed	OFF
BRAKE SW2	Ignition switch: ON	Brake pedal: Fully released	OFF
(Stop lamp switch)		Brake pedal: Slightly depressed	ON
DIST SW	Ignition switch: ON	DISTANCE switch: Pressed	ON
		DISTANCE switch: Released	OFF
VHCL SPD CUT	Ignition switch: ON		NON

J

K

M

Ν

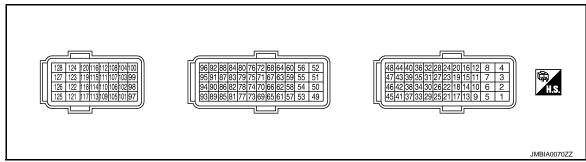
0

Р

Monitor Item	C	Values/Status	-	
LO SPEED CUT	Ignition switch: ON		NON	- A
AT OD MONITOR	Ignition switch: ON		OFF	_
AT OD CANCEL	Ignition switch: ON		OFF	EC
CRUISE LAMP	Ignition switch: ON	MAIN switch: Pressed at the 1st time \rightarrow at the 2nd time	$ON \to OFF$	_
	MAIN switch: ON	ASCD: Operating	ON	С
SET LAMP	 When vehicle speed is between 40 km/h (25 MPH) and 144 km/h (89 MPH) 	ASCD: Not operating	OFF	
EXH V/T LEARN	Engine: Running	Exhaust Valve Timing Control Learning has not been performed yet.	YET	- D
EAR V/I LEARIN	Cingille. Kullilling	CMPLT	Е	
BAT CUR SEN	 Engine speed: Idle Battery: Fully charged*² Selector lever: P or N Air conditioner switch: OFF No load 	Approx. 2,600 - 3,500 mV	F	
ALT DUTY	Engine: Idle		0 - 80%	G
A/F ADJ-B1	Engine: Running	-0.330 - 0.330	_	
A/F ADJ-B2	Engine: Running	-0.330 - 0.330	-	
FAN DUTY	Engine: Running	0 - 100%	- H	
ALT DUTY SIG	Power generation voltage variable	ON	_	
ALI DUTT SIG	Power generation voltage variable	OFF	-	

^{*1:} Accelerator pedal position sensor 2 signal and throttle position sensor 2 signal are converted by ECM internally. Thus, they differ from ECM terminals voltage signal.

TERMINAL LAYOUT



PHYSICAL VALUES

NOTE:

- ECM is located behind the instrument assist lower panel. For this inspection, remove passenger side instrument lower panel.
- Specification data are reference values and are measured between each terminal and ground.
- Pulse signal is measured by CONSULT-III.

^{*2:} Before measuring the terminal voltage, confirm that the battery is fully charged. Refer to PG-3. "How to Handle Battery".

	nal No.	Description			Value
+		Signal name	Input/ Output	Condition	(Approx.)
1 (W)	128 (B)	A/F sensor 1 heater (bank 1)	Output	[Engine is running]Warm-up conditionIdle speed (More than 140 seconds after starting engine)	2.9 - 8.8 V★ 50mSec/div 5V/div JMBIA0030GB
2	128	Throttle control motor	Output	[Ignition switch: ON] • Engine stopped • Selector lever: D • Accelerator pedal: Fully depressed	0 - 14 V★ 500μSec/div 5V/div JMBIA0031GB
(G)	(B)	(Open) (bank 1)	Culput	[Ignition switch: ON] • Engine stopped • Selector lever: D • Accelerator pedal: Fully released	0 - 14 V★ 500μSec/div 5V/div JMBIA0032GB
3 (R)	128 (B)	Throttle control motor relay power supply (bank 1)	Input	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)
4 (BR)	128 (B)	Throttle control motor (Close) (bank 1)	Output	 [Ignition switch: ON] Engine stopped Selector lever: D Accelerator pedal: In the middle of releasing operation 	0 - 14 V★ 500μSec/div 5V/div JMBIA0033GB
5 (GR)	128 (B)	A/F sensor 1 heater (bank 2)	Output	[Engine is running]Warm-up conditionIdle speed (More than 140 seconds after starting engine)	2.9 - 8.8 V★ 50mSec/div 5V/div JMBIA0030GB
				[Engine is running]Warm-up conditionIdle speed	BATTERY VOLTAGE (11 - 14 V)
6 (SB)	128 (B)	Exhaust valve timing control magnet retarder (bank 1)	Output	[Engine is running]Warm-up conditionAround 2,500 rpm while the engine speed is rising	7 - 12 V★ 5V/div JMBIA0034GB

	inal No. e color)	Description		O - m - diski - m	Value				
+		Signal name	Input/ Output	Condition	(Approx.)				
				[Engine is running] • Warm-up condition • Idle speed	BATTERY VOLTAGE (11 - 14 V)				
7 (Y)	128 (B)	Exhaust valve timing control magnet retarder (bank 2)	Output	[Engine is running]Warm-up conditionAround 2,500 rpm while the engine speed is rising	7 - 12 V★ 5V/div JMBIA0034GB				
8 (B)	_	ECM ground	_	_	_				
11 (GR)		Ignition signal No. 4		[Engine is running]	0 - 0.2 V★ 50mSec/div				
12 (L)		Ignition signal No. 3			Warm-up condition Idle speed NOTE: The pulse cycle changes depending	50mSec/div			
15 (V)	120	Ignition signal No. 5		on rpm at idle	2V/div JMBIA0035GB				
16 (G)	128 (B)	Ignition signal No. 2	Output		0.1 - 0.4 V★				
19 (SB)		Ignition signal No. 6 Ignition signal No. 1			[Engine is running]Warm-up conditionEngine speed: 2,000 rpm				
(Y)		- ig. mon orginal record			2V/div JMBIA0036GB				
17 (P)	128 (B)	Heated oxygen sensor 2 heater (bank 1)					Output	 [Engine is running] Engine speed: Below 3,600 rpm after the following conditions are met Engine: after warming up Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load 	50mSec/div 50mSec/div 5V/div JMBIA0037GB
				[Ignition switch: ON] • Engine stopped [Engine is running] • Engine speed: Above 3,600 rpm	BATTERY VOLTAGE (11 - 14 V)				
				[Engine is running]Warm-up conditionIdle speed	BATTERY VOLTAGE (11 - 14 V)				
18 128 (W) (B)		Output	[Engine is running]Warm-up conditionEngine speed: 2,000 rpm	7 - 12 V★ 5V/div JMBIA1638GB					

	inal No. e color)	Description		O an alitica	Value
+		Signal name	Input/ Output	Condition	(Approx.)
21	128	EVAP canister purge vol-		[Engine is running]Idle speedAccelerator pedal: Not depressed even slightly, after engine starting	BATTERY VOLTAGE (11 - 14 V) 50mSec/div 10V/div JMBIA0039GB
(GR)	(B)	ume control solenoid valve	Output	[Engine is running]Engine speed: Approx. 2,000 rpm (More than 100 seconds after starting engine)	BATTERY VOLTAGE (11 - 14 V) 50mSec/div 10V/div JMBIA0040GB
22 (LG)	128 (B)	Fuel pump relay	Output	[Ignition switch: ON] • For 1 second after turning ignition switch ON [Engine is running]	0 - 1.5 V
(20)	(3)			[Ignition switch: ON]More than 1 second after turning ignition switch ON	BATTERY VOLTAGE (11 - 14 V)
24 (BR)	128 (B)	ECM relay (Self shut-off)	Output	[Engine is running][Ignition switch: OFF]A few seconds after turning ignition switch OFF	0 - 1.5 V
(DIV)	(5)			[Ignition switch: OFF]More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14 V)
25 (O)	128 (B)	Throttle control motor relay	Output	[Ignition switch: ON \rightarrow OFF]	0 - 1.0 V ↓ BATTERY VOLTAGE (11 - 14 V) ↓ 0 V
				[Ignition switch: ON] [Engine is running]	0 - 1.0 V
				Warm-up condition Idle speed	BATTERY VOLTAGE (11 - 14 V)
29 (G)	128 (B)	Intake valve timing control solenoid valve (bank 2)	Output	[Engine is running]Warm-up conditionEngine speed: 2,000 rpm	7 - 12 V★ 5V/div JMBIA1638GB

Р

Terminal No. (Wire color)		Description		Condition	Value	
+		Signal name	Input/ Output	Condition	(Approx.)	
30	40	Throttle position sensor 1	Input	[Ignition switch: ON]Engine stoppedSelector lever: DAccelerator pedal: Fully released	More than 0.36 V	
(Y)	(R)	(bank 1)	mput	[Ignition switch: ON]Engine stoppedSelector lever: DAccelerator pedal: Fully depressed	Less than 4.75 V	
31	48	Throttle position sensor 1	loout	[Ignition switch: ON]Engine stoppedSelector lever: DAccelerator pedal: Fully released	More than 0.36 V	
(R)	(W)	(bank 2)	трис	Input	[Ignition switch: ON]Engine stoppedSelector lever: DAccelerator pedal: Fully depressed	Less than 4.75 V
33 (SB)	128 (B)	Heated oxygen sensor 2 heater (bank 2)	Output	 [Engine is running] Engine speed: Below 3,600 rpm after the following conditions are met Engine: after warming up Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load 	10 V★ 50mSec/div 5V/div JMBIA0037GB	
				[Ignition switch: ON] • Engine stopped [Engine is running] • Engine speed: Above 3,600 rpm	BATTERY VOLTAGE (11 - 14 V)	
34	40	Throttle position sensor 2	logut	[Ignition switch: ON]Engine stoppedSelector lever: DAccelerator pedal: Fully released	Less than 4.75 V	
(L)	(R)	(bank 1)	Input	[Ignition switch: ON]Engine stoppedSelector lever: DAccelerator pedal: Fully depressed	More than 0.36 V	
35	48	Throttle position sensor 2	locut	[Ignition switch: ON] • Engine stopped • Selector lever: D • Accelerator pedal: Fully released	Less than 4.75 V	
(B)	(W)	(bank 2)	Input	[Ignition switch: ON]Engine stoppedSelector lever: DAccelerator pedal: Fully depressed	More than 0.36 V	

	inal No. e color)	Description		0	Value	
+		Signal name	Input/ Output	Condition	(Approx.)	
37	128			 [Engine is running] Warm-up condition Idle speed NOTE: The pulse cycle changes depending on rpm at idle 	4.0 - 5.0 V★ 1mSec/div 2V/div JMBIA0041GB	
(LG)	(Y)	Crankshaft position sensor	Input	[Engine is running] • Engine speed: 2,000 rpm	4.0 - 5.0 V★ 1mSec/div 2V/div JMBIA0042GB	
40 (R)	_	Sensor ground [Throttle position sensor (bank 1)]	_	_	_	
43 (G)	48 (W)	Sensor power supply [Throttle position sensor (bank 2)]	_	[Ignition switch: ON]	5 V	
44 (B)	40 (R)	Sensor power supply [Throttle position sensor (bank 1)]	_	[Ignition switch: ON]	5 V	
46 (R)	47 (Y)	Sensor power supply [Crankshaft position sensor]	_	[Ignition switch: ON]	5 V	
47 (Y)	_	Sensor ground [Crankshaft position sensor]	_	_	_	
48 (W)	_	Sensor ground [Throttle position sensor (bank 2)]	_	_	_	
49 (L)	128 (B)	Throttle control motor (Close) (bank 2)	Output	 [Ignition switch: ON] Engine stopped Selector lever: D Accelerator pedal: In the middle of releasing operation 	0 - 14 V★ 500μSec/div 5V/div JMBIA0033GB	

	inal No. e color)	Description		Condition	Value	А
+		Signal name	Input/ Output	Condition	(Approx.)	
50	128	Throttle control motor	Output	[Ignition switch: ON] • Engine stopped • Selector lever: D • Accelerator pedal: Fully depressed	0 - 14 V★ 500μSec/div 5V/div JMBIA0031GB	C
(V)	(B)	(Open) (bank 2)	Output	[Ignition switch: ON] • Engine stopped • Selector lever: D • Accelerator pedal: Fully released	0 - 14 V★ 500μSec/div 5V/div JMBIA0032GB	E F
52 (R)	128 (B)	Throttle control motor relay power supply (bank 2)	Input	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)	G
53 (P)	128 (B)	Ignition switch	Input	[Ignition switch: OFF] [Ignition switch: ON]	0 V BATTERY VOLTAGE (11 - 14 V)	Н
57 (L)	128 (B)	A/F sensor 1 (bank 1)	Input	[Ignition switch: ON]	2.2 V	I
58	58 88 Exhaust valve tin	Exhaust valve timing con-	locut	 [Engine is running] Warm-up condition Idle speed NOTE: The pulse cycle changes depending on rpm at idle 	4.0 - 5.0 V★ 20mSec/div 2V/div JMBIA0043GB	J K
(Y)		(L) troi position sensor (bank Inp	Input	[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	4.0 - 5.0 V★ 20mSec/div 2V/div JMBIA0044GB	L M

Р

0

	inal No. e color)	Description		O an alitic an	Value
+		Signal name	Input/ Output	Condition	(Approx.)
59	96	Camshaft position sensor		 [Engine is running] Warm-up condition Idle speed NOTE: The pulse cycle changes depending on rpm at idle 	3.0 - 5.0 V★ 20mSec/div 2V/div JMBIA0045GB
(O)		Input	[Engine is running] • Engine speed: 2,000 rpm	3.0 - 5.0 V★ 20mSec/div 2V/div JMBIA0046GB	
60 (R)	128 (B)	Sensor power supply [Camshaft position sensor (bank 1), Exhaust valve timing control position sen- sor (bank 1), Power steer- ing pressure sensor]	_	[Ignition switch: ON]	5 V
61 (R)	128 (B)	A/F sensor 1 (bank 1)	Input	[Engine is running]Warm-up conditionEngine speed: 2,000 rpm	1.8 V Output voltage varies with air fuel ratio.
62	88	Exhaust valve timing control position sensor (bank 2)		 [Engine is running] Warm-up condition Idle speed NOTE: The pulse cycle changes depending on rpm at idle 	4.0 - 5.0 V★ 20mSec/div 2V/div 2V/div 2DMSec/div 3MBIA0043GB
(G)	(L)		Input	[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	4.0 - 5.0 V★ 20mSec/div 2V/div JMBIA0044GB

	inal No. e color)	Description		Condition	Value
+		Signal name	Input/ Output	Condition	(Approx.)
63	128	Camshaft position sensor	Input	 [Engine is running] Warm-up condition Idle speed NOTE: The pulse cycle changes depending on rpm at idle 	3.0 - 5.0 V★ 20mSec/div 2V/div JMBIA0045GB
(SB)	(B)	(bank 2)	mput	[Engine is running] • Engine speed: 2,000 rpm	3.0 - 5.0 V★ 20mSec/div 2V/div JMBIA0046GB
64 (W)	128 (B)	Sensor power supply [Camshaft position sensor (bank 2), Exhaust valve timing control position sen- sor (bank 2), Battery cur- rent sensor]	_	[Ignition switch: ON]	5 V
65 (V)	128 (B)	A/F sensor 1 (bank 2)	Input	[Ignition switch: ON]	2.2 V
66 (LG)	128 (B)	A/F sensor 1 (bank 2)	Input	[Engine is running]Warm-up conditionEngine speed: 2,000 rpm	1.8 V Output voltage varies with air fuel ratio.
67 (P)	68 (LG)	Intake air temperature sensor (bank 1)	Input	[Engine is running]	0 - 4.8 V Output voltage varies with intake air temperature.
68 (LG)	_	Sensor ground [Mass air flow sensor (bank 1), Intake air temperature sensor (bank 1)]	_	_	_
69 (W)	72 (B/W)	Knock sensor (bank 2)	Input	[Engine is running] • Idle speed	2.5 V* ¹
71 (Y)	84 (B)	Engine coolant tempera- ture sensor	Input	[Engine is running]	0 - 4.8 V Output voltage varies with engine coolant temperature.
72 (B/W)	_	Sensor ground (Knock sensor)	_	_	_
73 (W)	72 (B/W)	Knock sensor (bank 1)	Input	[Engine is running] • Idle speed	2.5 V* ¹
76 (W)	84 (B)	Heated oxygen sensor 2 (bank 1)	Input	 [Engine is running] Revving engine from idle to 3,000 rpm quickly after the following conditions are met Engine: after warming up Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load 	0 - 1.0 V

	inal No. e color)	Description		Condition	Value	
+		Signal name	Input/ Output	Condition	(Approx.)	
77	68	Mass air flow sensor (bank	Input	[Engine is running]Warm-up conditionIdle speed	0.8 - 1.1 V	
(SB)	(LG)	1)	прис	[Engine is running]Warm-up conditionEngine speed: 2,500 rpm	1.4 - 1.7 V	
78 (G)	84 (B)	Engine oil temperature sensor	Input	[Engine is running]	0 - 4.8 V Output voltage varies with engine oil temperature.	
79	94	Mass air flow sensor (bank	Input	[Engine is running]Warm-up conditionIdle speed	0.8 - 1.1 V	
(GR)	(LG)	2)	прис	[Engine is running]Warm-up conditionEngine speed: 2,500 rpm	1.4 - 1.7 V	
80 (O)	84 (B)	Heated oxygen sensor 2 (bank 2)	Input	 [Engine is running] Revving engine from idle to 3,000 rpm quickly after the following conditions are met Engine: after warming up Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load 	0 - 1.0 V	
81 (R)		Fuel injector No. 3			BATTERY VOLTAGE (11 - 14 V)★	
82 (V)		Fuel injector No. 6			[Engine is running]Warm-up conditionIdle speedNOTE:	50mSec/div
85 (BR)	128	Fuel injector No. 2		The pulse cycle changes depending on rpm at idle	10V/div JMBIA0047GB	
86 (W)	(B)	Fuel injector No. 5	Output		BATTERY VOLTAGE (11 - 14 V)★	
89 (GR)		Fuel injector No. 1		[Engine is running]Warm-up conditionEngine speed: 2,000 rpm	50mSec/div	
90 (O)		Fuel injector No. 4		Engine speed. 2,000 ipin	10V/div JMBIA0048GB	
83 (R)	94 (LG)	Intake air temperature sensor (bank 2)	Input	[Engine is running]	0 - 4.8 V Output voltage varies with intake air temperature.	
84 (B)	_	Sensor ground (Heated oxygen sensor 2, Engine coolant tempera- ture sensor, Engine oil tem- perature sensor)	_	_	_	
87	96	Power steering pressure	Output	[Engine is running] • Steering wheel: Being turned	0.5 - 4.5 V	
(Y)	(B)	sensor	Output	[Engine is running] • Steering wheel: Not being turned	0.4 - 0.8 V	

[VQ35HR]

	inal No. e color)	Description		Condition	Value	А
+		Signal name	Input/ Output	Condition	(Approx.)	
88 (L)	_	Sensor ground [Exhaust valve timing control position sensor (bank 1), Exhaust valve timing control position sensor (bank 2)]	_	_	_	C
91 (SB)	95 (G)	Battery current sensor	Input	 [Engine is running] Battery: Fully charged*² Idle speed 	2.6 - 3.5 V	D
92 (P)	_	Sensor ground [Camshaft position sensor (bank 2)]	_	[Engine is running]Warm-up conditionIdle speed	0 V	Е
93 (P)	128 (B)	Power supply for ECM (Back-up)	Input	[Ignition switch: OFF]	BATTERY VOLTAGE (11 - 14 V)	F
94 (LG)	_	Sensor ground [Mass air flow sensor (bank 2)]	_	_	_	G
95 (G)	_	Sensor ground (Battery current sensor)	_	_	_	
96 (B)	_	Sensor ground [Camshaft position sensor (bank 1), Power steering pressure sensor]	_	_	_	Н
97	100	Accelerator pedal position		[Ignition switch: ON]Engine stoppedAccelerator pedal: Fully released	0.45 - 1.0 V	I
(R)	(W)	sensor 1	Input	[Ignition switch: ON] • Engine stopped • Accelerator pedal: Fully depressed	4.4 - 4.8 V	J
98 (P)* ³	104 (GR)* ³	Accelerator pedal position	loout	[Ignition switch: ON] • Engine stopped • Accelerator pedal: Fully released	0.22 - 0.50 V	K
(Y)* ⁴	(BR)* ⁴	sensor 2	Input	[Ignition switch: ON] • Engine stopped • Accelerator pedal: Fully depressed	2.1 - 2.5 V	L
99 (L)* ³ (G)* ⁴	100 (W)	Sensor power supply (Accelerator pedal position sensor 1)	_	[Ignition switch: ON]	5 V	M
100 (W)	_	Sensor ground (Accelerator pedal position sensor 1)	_	_	_	Ν

0

Р

	nal No. color)	Description		Condition	Value
+		Signal name	Input/ Output	Condition	(Approx.)
				[Ignition switch: ON] • ICC steering switch: OFF	4.2 V
				[Ignition switch: ON] • MAIN switch: Pressed	0 V
				[Ignition switch: ON] • CANCEL switch: Pressed	1.9 V
101 (SB)	108 (V)	ICC steering switch (models with ICC system)	Input	[Ignition switch: ON] • RESUME/ACCELERATE switch: Pressed	3.7 V
				[Ignition switch: ON] • SET/COAST switch: Pressed	3.2 V
				[Ignition switch: ON] • DISTANCE switch: Pressed	2.6 V
				[Ignition switch: ON] • LDP switch: Pressed	1 V
				[Ignition switch: ON] • ASCD steering switch: OFF	4 V
	108 (V)	ASCD steering switch (models with ASCD system)	Input	[Ignition switch: ON] • MAIN switch: Pressed	0 V
101 (SB)				[Ignition switch: ON] • CANCEL switch: Pressed	1 V
,				[Ignition switch: ON] • RESUME/ACCELERATE switch: Pressed	3 V
				[Ignition switch: ON] • SET/COAST switch: Pressed	2 V
102 (LG)	112 (V)	EVAP control system pressure sensor	Input	[Ignition switch: ON]	1.8 - 4.8 V
103 (L)* ³ (G)* ⁴	104 (GR)* ³ (BR)* ⁴	Sensor power supply (Accelerator pedal position sensor 2)	_	[Ignition switch: ON]	5 V
104 (GR)* ³ (BR)* ⁴	_	Sensor ground (Accelerator pedal position sensor 2)	_	_	_
105 (L)	116 (W)	Refrigerant pressure sensor	Input	 [Engine is running] Warm-up condition Both A/C switch and blower fan motor switch: ON (Compressor operates) 	1.0 - 4.0 V
106 (W)	128 (B)	Fuel tank temperature sensor	Input	[Engine is running]	0 - 4.8 V Output voltage varies with fuel tank temperature.
107 (BR)	112 (V)	Sensor power supply (EVAP control system pressure sensor)	_	[Ignition switch: ON]	5 V
108 (V)	_	Sensor ground (ASCD/ICC steering switch)	-	_	_

[VQ35HR]

	nal No. color)	Description		Condition	Value	A
+		Signal name	Input/ Output	Condition	(Approx.)	
109	128	PNP signal	Input	[Ignition switch: ON] • Selector lever: P or N	BATTERY VOLTAGE (11 - 14 V)	Ε
(G)	(B)	TWI Signal	при	[Ignition switch: ON] • Selector lever: Except above	0 V	
110	128		Output	 [Engine is running] Warm-up condition Idle speed NOTE: The pulse cycle changes depending on rpm at idle 	1 V★ 10mSec/div 2V/div JMBIA0076GB	
(R)	(B)	Engine speed signal output	Output	[Engine is running] • Engine speed is 2,000 rpm	1 V★ 10mSec/div 2V/div JMBIA0077GB	(
111 (O)	116 (W)	Sensor power supply (Refrigerant pressure sensor)	_	[Ignition switch: ON]	5 V	
112 (V)	_	Sensor ground (EVAP control system pressure sensor)	_	_	_	
113 (P)	_	CAN communication line	Input/ Output	_	_	
114 (L)	_	CAN communication line	Input/ Output	_	_	
116 (W)	_	Sensor ground (Refrigerant pressure sensor)	_	_	_	
117 (GR)	_	Data link connector	Input/ Output	_	_	
121 (LG)	128 (B)	EVAP canister vent control valve	Output	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)	
122 (P)	128 (B)	Stop lamp switch	Input	[Ignition switch: OFF] • Brake pedal: Fully released	0 V	
(r)	(D)			[Ignition switch: OFF] • Brake pedal: Slightly depressed	BATTERY VOLTAGE (11 - 14 V)	
123 (B) 124 (B)	_	ECM ground	_	_	_	
125 (GR)	128 (B)	Power supply for ECM	Input	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)	

	inal No. e color)	Description		Condition	Value
+		Signal name	Input/ Output	Condition	(Approx.)
126		ICC brake switch (models with ICC system)	Input	[Ignition switch: ON] • Brake pedal: Slightly depressed	0 V
(BR) (B	(B)	ASCD brake switch (models with ASCD system)		[Ignition switch: ON] • Brake pedal: Fully released	BATTERY VOLTAGE (11 - 14 V)
127 (B) 128 (B)	_	ECM ground	_	_	_

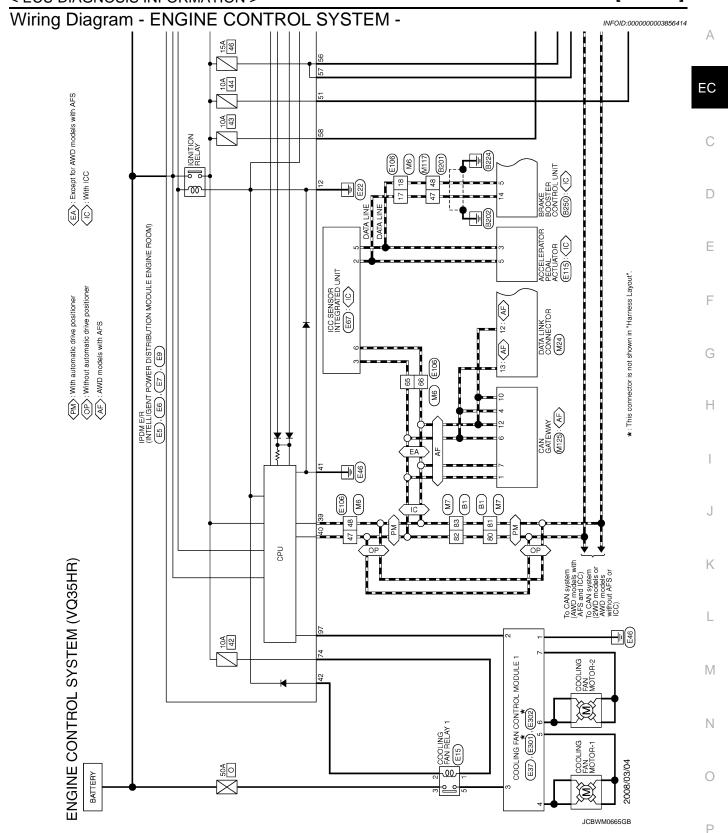
^{★:} Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

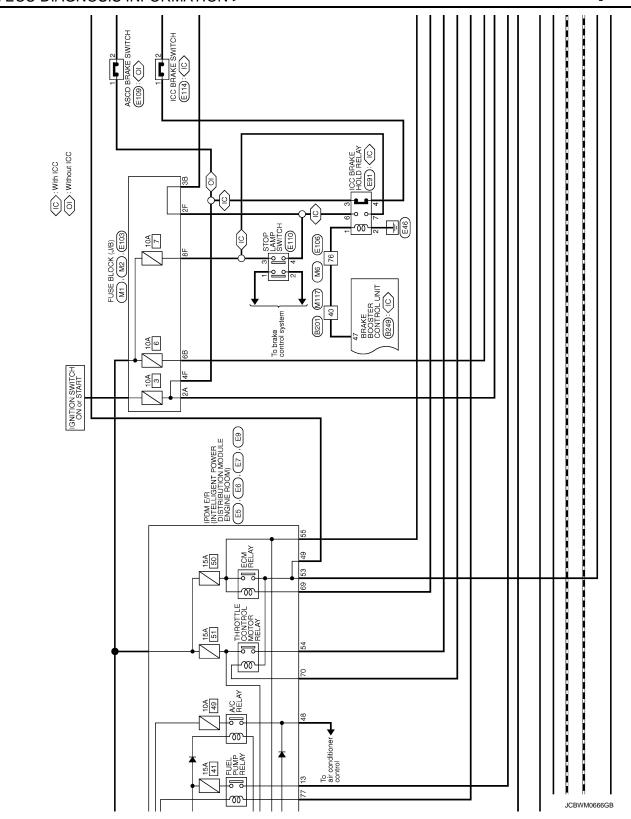
^{*1:} This may vary depending on internal resistance of the tester.

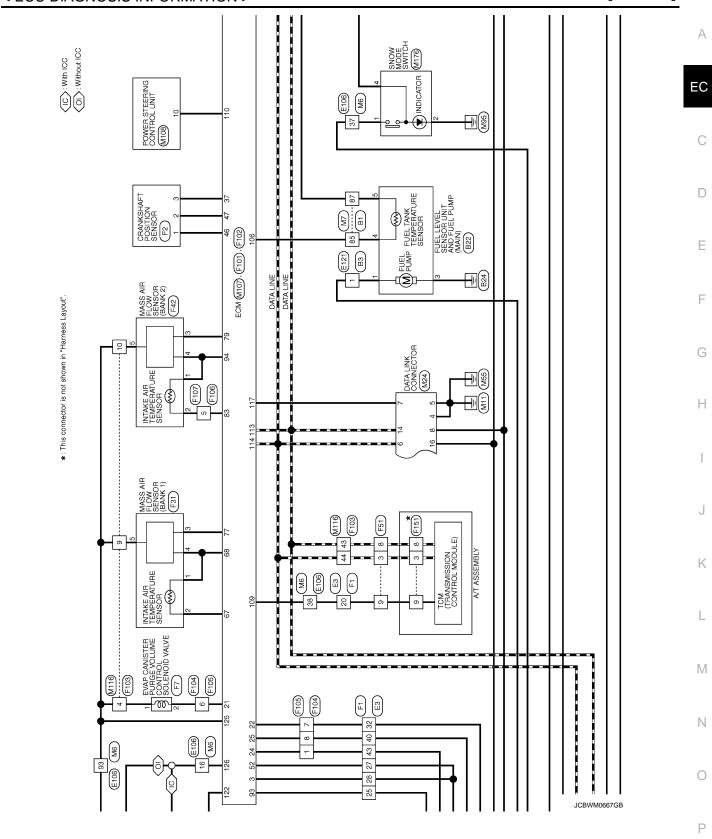
^{**2:} Before measuring the terminal voltage, confirm that the battery is fully charged. Refer to PG-3, "How to Handle Battery".

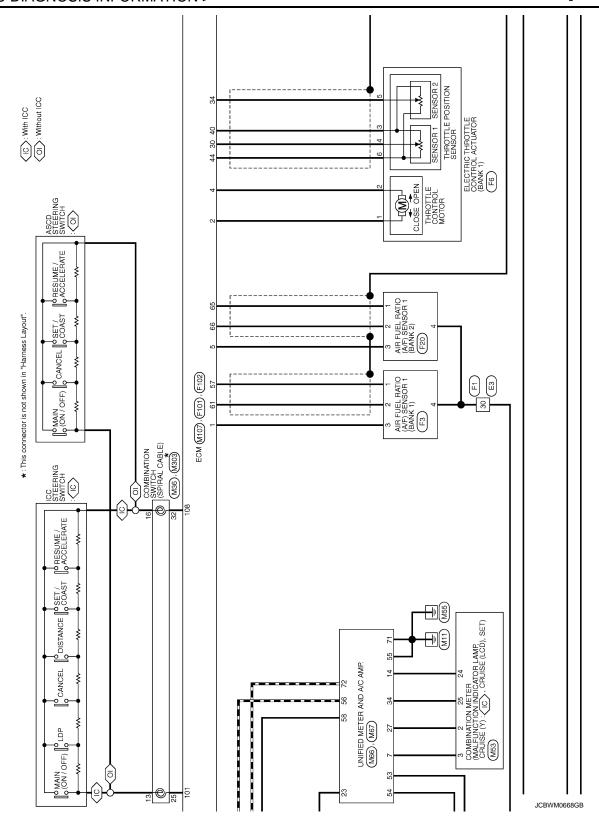
^{*3:} Models with ICC

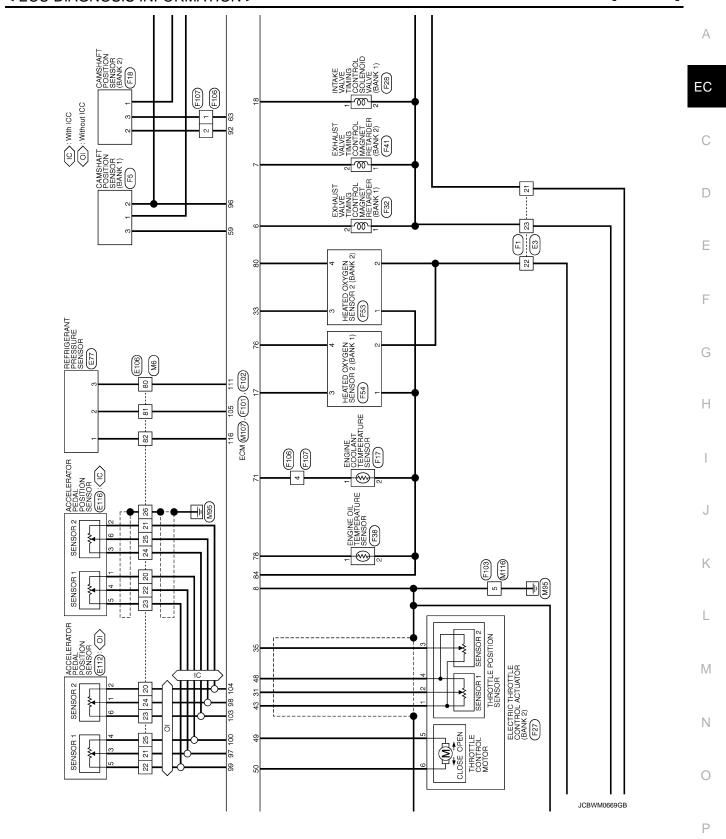
^{*4:} Models with ASCD

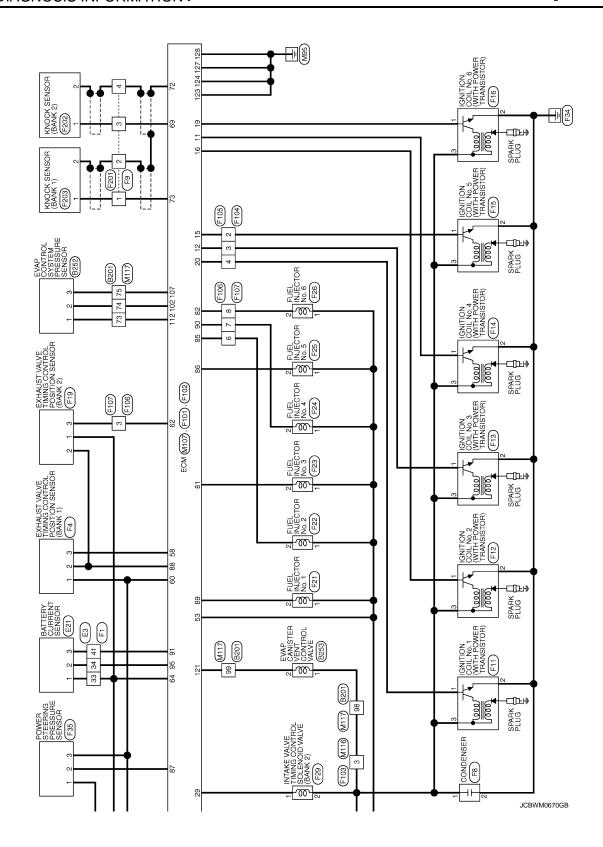






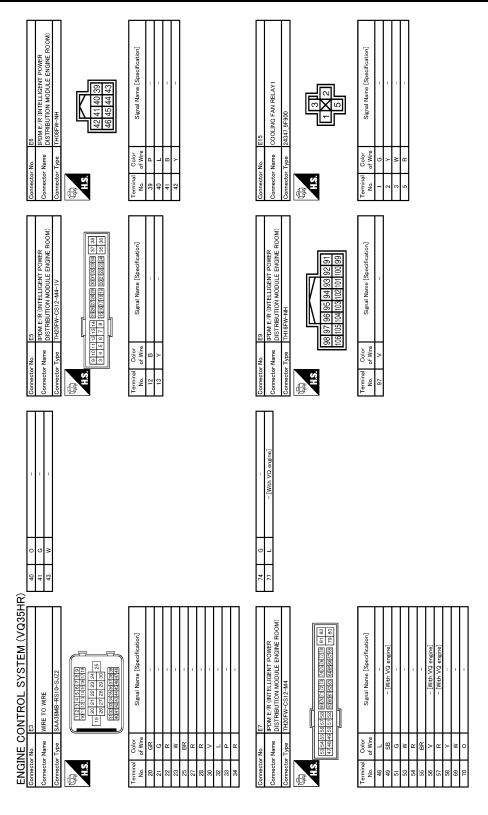






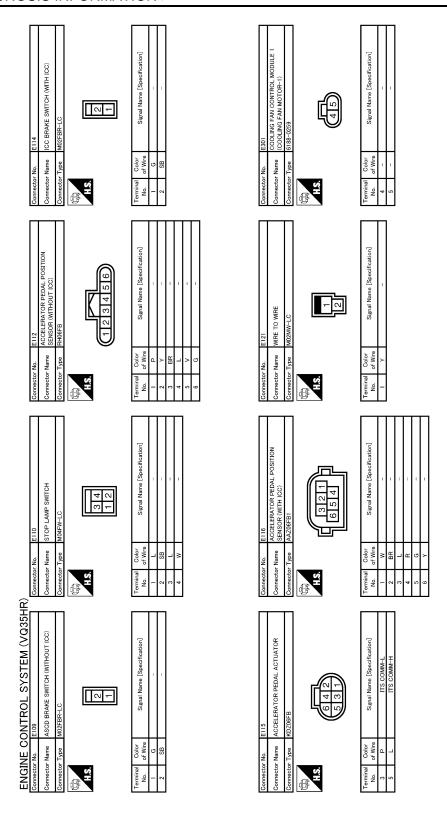
Page 222	A EC C D E
Connector Name WIRE TO WIRE	H I J
Connector Name WRE TO WRE	L M N O JCBWM0671GB

Revision: 2009 March EC-525 2009 FX35/FX50



JCBWM0672GB

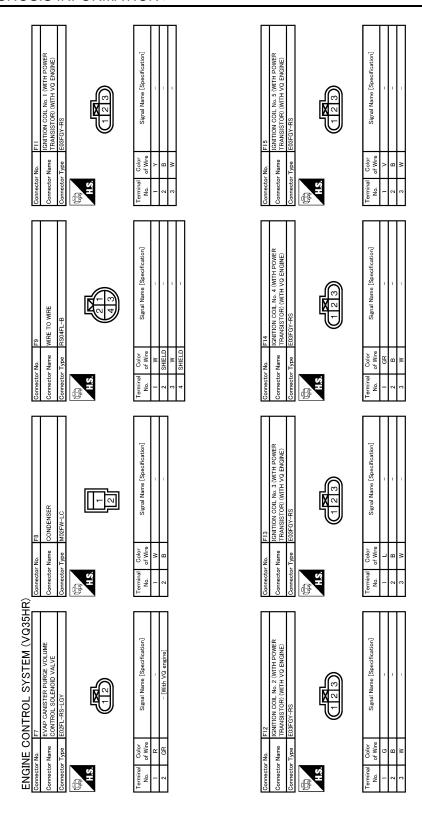
REFRICERANT PRESSURE SENSOR RKOJFB (123) Signal Name [Specification]	[Without IOC] - [With ICC]		1 1		A
Connector No. E77	25 L W SB	+++++	M 88 88 86 86 86 86 86 86 86 86 86 86 86		C D
	113 COMM-1 113 COMM-1 115 COMM-1 115 COMM-1 116 COMM-1 116 COMM-1 116 COMM-1 116 COMM-1 116 COMM-1 116 COMM-1 116 COMM-1 116 COMM-1 116 COMM-1 117 COMM-1 117 COMM-1 117 COMM-1 118 CO		Signal Name (Specification)		E F
Connector No. E67 Connector Name ICC SENSOI Connector Type RS08FB-PR H.S. H.S. I errminal Color No. of Wire	2 C Connector No. E106 Connector No. E106 Connector Name WIRE TO WIRE	86 79 88 88 88 88 88 88 88 88 88 88 88 88 88	Color Color Color No. of Wire Color Color		G H
E37 COOLING FAN CONTROL MODULE 1 SJZDIFGY-SNZZ Signal Name [Specification]	(a/r) W107E BTOCK (1/g)	35 125 115 101 95 8F	Signal Name [Specification]		I
Connector No. Connector Name Connector Type Terminal Color No. of Wire I of the Color Connector Type	2 V S S S S S S S S S	F 6F 5F 14F	Terminal Color No. of Wire 2F W 4F G 8F L		K
ENGINE CONTROL SYSTEM (VQ35HR) Connector Name BATTERY CURRENT SENSOR Connector Type RH03FB Connector Type RH03FB Terminal Color No. of Wire No. of W	- [With VO engine] - [With VO engine] - [With VO engine]		Signal Name [Specification]		M
ENGINE CONTRO Connector No. E21 Connector Type RH03FB Terminal Color No. of Wire Sign	2 R	adó	Terminal Color Sig. 10 Color Sig. 2 B B B B B B C C C C C C C C C C C C C		N O
				JCBWM0673GB	Р



JCBWM0674GB

Connector No. F2 Connector Name GRANKSHAFT POSITION SENSOR Connector Type RHGSFB		Terminal Color Signul Name Specification No. of Wine Signul Name Specification	Connector No. F6 Connector Name	Terminal Color Signal Name [Specification] Color 1	EC C
			SENSOR (BANK	Signal Name [Specification]	Е
			F5 CAMSHAET POSITION SENSOR (BANK 1) (WITH VQ ENGINE) RH03FB		F
40 0 41 SB 43 BR			Connector No. Connector Name Connector Type	Color Colo	G H
FI WIRE TO WIRE SAA38FB-RS 10-SJZZ	D S T D D D	Signal Name [Specification]	F4 EXHAUST VALVE TIMING CONTROL POSITION SENSOR (BANK I) (WITH YO ENGINE) THOSPE 1 2 3	Signal Name [Specification]	J
Connector No. F1 Connector Name WIRE TO WIRE Connector Type SA438FB-RS1		Terminal Color No. of Wire No. of Wire 21 P 22 C 23 W 23 W 25 P 25 P 26 P 27 R 28 R 28 R 38 GR	Connector No. F4 Connector Name EXHAUST Connector Type RHGFE LS.	Terminal Codor No. of Wire 1 R R 2 L 3 Y	К
]	btion]		ttion]	L
ONTROL SYSTEM (V E302 COOLING FAN CONTROL MODULE I (COOLING FAN MOTOR-2) 6188-0259		Signal Name (Specification)	F3 AIR FUEL RATIO (A,F) SENSOR 1 (BARK 1) (WITH VO ENGINE) AF204FDGY (12) (34)	Signal Name [Specification]	M
ŏ∏ ၞŢ.		of Wire	e e	Color of Wine	N
Connector No. Connector Nan Connector Typ	E .	Terminal No. No. 6 6 7 7	Connector Nor	Terminal No. 1 1 2 2 2 2 2 4 4 4 4 4 4 4 4 4 4 4 4 4	JCBWM0675GB
					Р

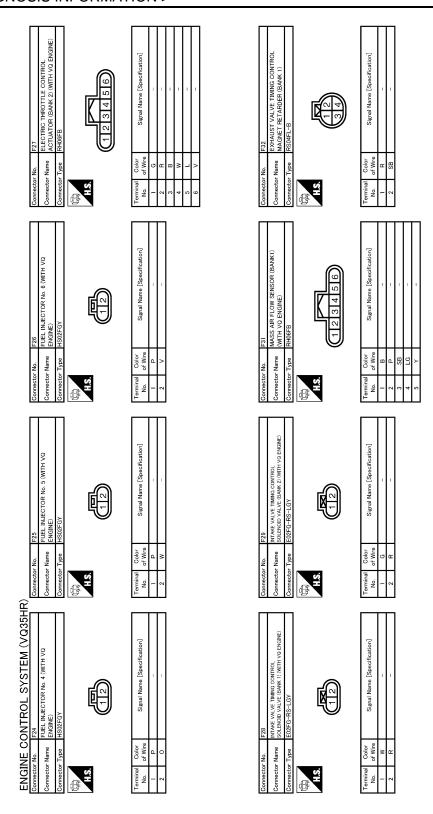
Revision: 2009 March **EC-529** 2009 FX35/FX50



JCBWM0676GB

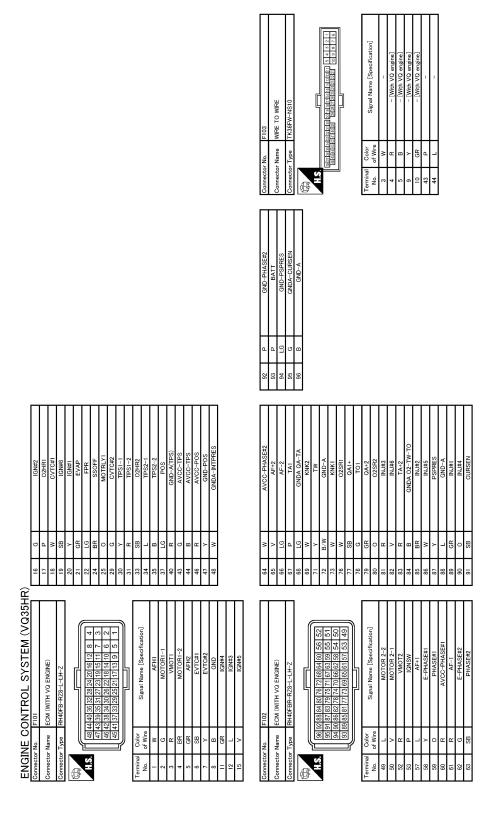
HORRE	NJ		[10]		А
F19 EXHAUST VALVE TIMING CONTROL POSITION SENSOR (BANK 2) (WITH VO ENCINE) RHG3FB 1 2 3	Signal Name (Specification)	F23 FUEL INJECTOR No. 3 (WITH VO ENGINE) HS02FGY	Signal Name [Specification]		EC
ector No. ector Name ector Type	Terminal Golor No. of Wire 1 Wire 2 L 3 G	ector No. ector Name ector Type	Terminal Color No. of Wire 2 P P P P P P P P P P P P P P P P P P		C
					Е
F18 CAMSHAFT POSITION SENSOR (BANK 2) (WITH VO ENGINE) RHGSFB (1 2 3)	Signal Name [Specification]	F22 FUEL INJECTOR No. 2 (WITH VO ENGINE) HS02FGY (12)	Signal Name [Specification]		F
Connector No. F18 Connector Name 2. (WIT) Connector Type RH03F8 H.S.	No. of Wire 1 No. 2 P P SB	Connector No. F22 Connector Name FUEL IN. Connector Type HSC/PFGY LS. LS.	Color No. Other No. Other Other		G
					Н
FIT ENGINE COOLANT TEMPERATURE SENSOR EUZFUY-RS (12)	Signal Name (Specification) [With VQ engine]	F21 FUEL INJECTOR No. 1 (WITH VO ENGINE) HSOPFGY	Signal Name [Specification]		J
Connector No. F17 Connector Name ENGINE CO Connector Type EUZFGY-RS H.\$.	Terminal Golor No. of Wire 2 B	Connector No. F21. IN. Connector Name FUEL IN. Connector Type HS02FG7 LS.	Terminal Color No. of Wire 1 P P CGR		K
<u> </u>					L
DNTROL SYSTEM (V	Signal Name (Specification)	P20 AIR FUEL RATIO (A.F.) SENSOR 1 (GAMK 2) (WITH VO ENGINE) AFZOGFDGY AFZOGFDGY 3 4	Signal Name [Specification]		M
ŏП"П	Color SB B B B		Color Color Color		N
ENGINE Connector Nam Connector Type H.S.	No. No. 2	Connector No.	Terminal No. 2 2 2 2 4 4 4	JCBWM0677GB	0
					Р

Revision: 2009 March EC-531 2009 FX35/FX50



JCBWM0678GB

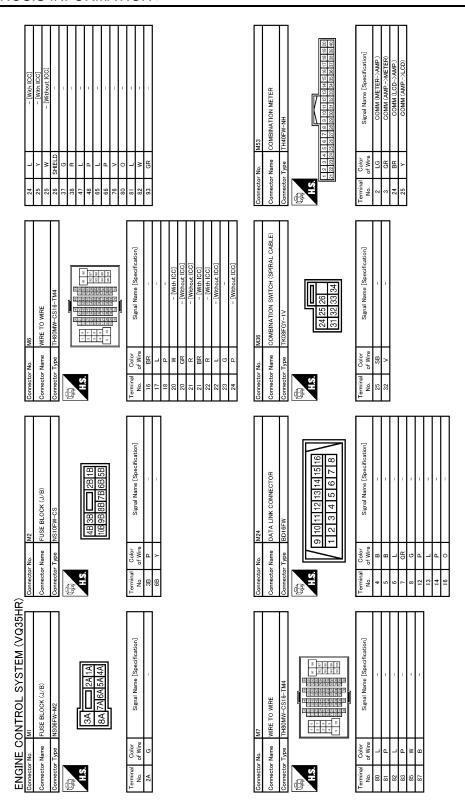
Connector No. F42 Connector Name (WMTH VO ENGINE) Connector Type RH09FB HS.	Terminal Color Signal Name [Specification] No. of Wire Y		A EC C
Connector No. F41 Connector Name EXHAUST VALVE TIMING CONTROL MAGNET RETARDER (BANK 2) Connector Type RSO4FL-B HS.	Terminal Color Signal Name [Specification]	Comector No. F54	E F G H
Connector No. F38 Connector Name ENGINE OIL TEMPERATURE SENSOR Connector Type EDZFGY-RS H.S.	Terminal Color Signal Name Specification No. of Wire Good Of Wire Of Wire Of Wire Of W	Connector No F53 Connector Name HATED OXYGEN SENSOR 2 (BANK 2) Connector Type AFZOAFB AFZOAF	o K
ENGINE CONTROL SYSTEM (VQ35HR) Connector No. F.35 Connector Name POWER STERRING PRESSURE SENSOR Connector Type RK03FB H.3.	Terminal Color Signal Name Specification No. of Wire Signal Name Specification	Connector No F5	M N O
			Р



JCBWM0680GB

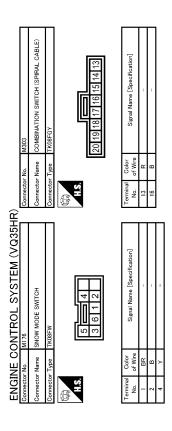
Connector No. F107 Connector Name WIRE TO WIRE Connector Type TH/08MW-NH H.S. 1 2 3 4 1 5 6 7 8	Terminal Color No. of Wire 1 SB	Connector No. F203 KNIOK SENSOR (BANK I) (WITH VO	A EC
Connector No. F106 Connector Name WIRE TO WIRE Connector Type TH08FW-NH H.S. 4 3 2 1	Terminal Color No. of Wire Signal Name [Specification] Color Signal Name [Specification] Color Color	Connector No. F202 Connector No. F202 Connector No. KNOCK SENSOR (BANK 2) (WITH VO ENGINE) Connector Type E02F G-RS-LGY	E F G
Connector No. F105	Terminal Color No. of Wire 1 BR	Connector No. F201	J K
ENGINE CONTROL SYSTEM (VQ35HR) Connector Name WIRE TO WIRE Connector Type TH08FW-NH H.S. 4 3 2 1 8 7 6 5	Terminal Color No. of Wire Signal Mane [Specification] No. of Wire Signal Mane [Specification]	Connector No. F151 Connector Name TCM (TRANSMISSION CONTROL MODULE) Connector Type SP10FG	M N O
			Р

Revision: 2009 March **EC-535** 2009 FX35/FX50



JCBWM0682GB

CAND_A(ADCQ) [Mask roc]		GNDA ASCD NEUT-H TACHO AVCC-PDPRESS GND-A VEIGAN-LI VEIGAN-LI VAIDA-ENDERE	ALINE CORON CORON GND GND GND GND GND GND	MI25 CAN GATEWAY THIZPW-N8H 1 2 3 4 5 6 7 8 9 10 11 12	Signal Name [Specification] CAN-H CAN-H CAN-L CAN-L CAN-L CAN-L CAN-L		A EC
ga Poj	₩	108 C C 109 C C C C C C C C C C C C C C C C C C C	117 GR 123 P 123 B 124 B 125 GR 126 GR 127 B 128 B 128 B	Connector No. Connector Name Connector Type	Terminal Color No. of Wire 1 L L 4 L L 6 L 7 P P 10 P 12 P 12 P 12 P 12 P 12 P 12 P		D
M107	ECM (WITH VQ ENGINE) RH24FGY-RZ8-R-LH-Z	128 124 1221 16 1721 16 172 10 172 172 172 172 172 172 172 172 172 172	Signal Name [Specification] APS2 [Without ICC] APS2 [Without ICC] AVCC-APS1 [Without ICC] AVCC-APS1 [With ICC] AVCC-APS1 [With ICC] AVCC-APS2 [With ICC] AVCC-APS2 [With ICC] AVCC-APS2 [Without ICC] AVCC-APS2 [Without ICC] AVCC-APS2 [Without ICC]	MILT WIRE TO WIRE THEOMY-CS16-TMA	Signal Name [Specification] - [With IOC] - [With IOC]		E
M retreated	e e		Terminal Color No. of Wire 97 R 98 Y 99 C 100 W 101 C 102 L 102 L 103 C 103 C 104 C C 104 C C 104 C C C C C C C C C	Connector Name W	Terminal Color		G H
	UNIFIED METER AND A/C AMP. TH32FW-NH	7 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Signal Name [Specification] IGN BAT GNU CAN+H FUEL LEVEL SENS GND GND CAN-L	Trans	Signal Nane [Specification]		J
Connector No M67	Connector Name	H.S. (41 42 43 44 45 46 162 163 163 160 161 162 163 163 163 163 163 163 163 163 163 163	Terminal Odor No. of Wire No. of Wire No. of Wire No. of Wire No. of Mire No. of Wire No. of Wire	Connector No. MI16 Connector Name WIRE TO WIRE Connector Type TK38MW-NSIG	Terminal Octor No. of Wire 1 4 8 R 10 P 10 R 10 R 43 P 44 L		K
(VQ35HR		17 18 19 20 37 88 39 440	ion]	TIN	[iou]		L
ENGINE CONTROL SYSTEM (VQ35HR)	UNIFIED METER AND A/C AMP. TH40FW-NH	0 11 12 13 14 15 16 17 0 31 32 33 84 35 58 37	Signal Name (Specification) COMM (AMPNeETER) COMM (LCD->AMP.) A TI SNOW 3W COMM (METER->AMP.) COMM (AMP>LCD)	MIOB THIZPW-NH THIZPW-NH 1 2 3 4 5 6 7 8 9 10 11 12	Signal Name [Specification] ENG TACHO		M
CONTRO	ie UNIFIED MET	71 2 3 4 5 6 7 8 9 1		пп	Ш		Ν
ENGINE	Connector Name	H.S.	Terminal Color No. of Wire No. of Wire 14 BR 23 Y 27 LG 34 Y	Connector No. Connector Type Connector Type H.S.	Terminal Color No. of Wire 10 R		0
						JCBWM0683GB	Р



JCBWM0684GB

INFOID:0000000003856415

NON DTC RELATED ITEM

Fail-safe

[VQ35HR]

Е

F

G

Н

Κ

L

M

Ν

0

Ρ

Engine operating condition in fail-safe mode	Detected items	Remarks	Reference page	Α
Engine speed will not rise more than 2,500 rpm due to the fuel cut	Malfunction indicator lamp circuit	When there is an open circuit on MIL circuit, the ECM cannot warn the driver by illuminating MIL when there is malfunction on engine control system.		EC
		Therefore, when electrical controlled throttle and part of ECM related diagnoses are continuously detected as NG for 5 trips, ECM warns the driver that engine control system malfunctions and MIL circuit is open by means of operating the fail-safe function. The fail-safe function also operates when above diagnoses except MIL circuit are detected and demands the driver to repair the malfunction.	EC-488	С
DTC RELATED ITE	M		•	D

DTC No.	Detected items	Engine operating condition in fail-safe mode		
P0011 P0021	Intake valve timing control	The signal is not energized to the intake valve timing control solenoid valve and the valve control does not function.		
P0014 P0024	Exhaust valve timing control	The signal is not energized to the exhaust valve timing control magnet retarder and the magnet retarder control does not function.		
P0102 P0103 P010C P010D	Mass air flow sensor circuit	Engine speed will not rise more than 2,400 rpm due to the fuel cut.		
P0117 P0118	Engine coolant tempera- ture sensor circuit		determined by ECM based on the following condition. oolant temperature decided by ECM.	
		Condition	Engine coolant temperature decided (CONSULT-III display)	
		Just as ignition switch is turned ON or START	40°C (104°F)	
		Approx. 4 minutes or more after engine starting	80°C (176°F)	
		Except as shown above	40 - 80°C (104 - 176°F) (Depends on the time)	
		When the fail-safe system for engine coolant temperature sensor is activated, the fan operates while engine is running.		
P0122 P0123 P0222 P0223 P0227 P0228 P1239 P2132 P2133 P2135	Throttle position sensor	The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. Therefore, the acceleration will be poor.		
P0196 P0197 P0198	Engine oil temperature sensor	Exhaust valve timing control does r	not function.	
P0500	Vehicle speed sensor	The cooling fan operates (Highest)	while engine is running.	
P0605	ECM	(When ECM calculation function is malfunctioning:) ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring. ECM deactivates ASCD operation.		
P0643	Sensor power supply	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.		
P1233 P2101	Electric throttle control function	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.		

< ECU DIAGNOSIS INFORMATION >

DTC No.	Detected items	Engine oper	ating condition in fail-safe mode	
P1236 P2118	Throttle control motor	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.		
P1238 P2119	Electric throttle control actuator	(When electric throttle control actuator does not function properly due to the return spring malfunction:) ECM controls the electric throttle actuator by regulating the throttle opening around the idle position. The engine speed will not rise more than 2,000 rpm.		
		(When throttle valve opening angle in fail-safe mode is not in specified range:) ECM controls the electric throttle control actuator because regulating the throttle opening to 20 degrees or less.		
		(When ECM detects the throttle valve is stuck open:) While the vehicle is being driven, it slows down gradually by fuel cut. After the vehicle stops, the engine stalls. The engine can restart in N or P position, and engine speed will not exceed 1,000 rpm or more.		
P1290 P2100 P2103	Throttle control motor relay	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.		
P1805	Brake switch	ECM controls the electric throttle of small range. Therefore, acceleration will be poor	ontrol actuator by regulating the throttle opening to a r.	
		Vehicle condition	Driving condition	
		When engine is idling	Normal	
		When accelerating	Poor acceleration	
P2122 P2123 P2127 P2128 P2138	Accelerator pedal position sensor	The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. Therefore, the acceleration will be poor.		

DTC Inspection Priority Chart

INFOID:0000000003856416

If some DTCs are displayed at the same time, perform inspections one by one based on the following priority chart.

Priority	Detected items (DTC)	А
1	 U0101 U0164 U1001 CAN communication line P0101 P0102 P0103 P010B P010C P010D Mass air flow sensor P0112 P0113 P0127 Intake air temperature sensor P0116 P0117 P0118 P0125 Engine coolant temperature sensor P0122 P0123 P0222 P0223 P0227 P0228 P1225 P1226 P1234 P1235 P1239 P2132 P2133 P2135 Throttle position sensor P0128 Thermostat function P0181 P0182 P0183 Fuel tank temperature sensor 	E
	 P0196 P0197 P0198 Engine oil temperature sensor P0327 P0328 P0332 P0333 Knock sensor P0335 Crankshaft position sensor P0340 P0345 Camshaft position sensor P0460 P0461 P0462 P0463 Fuel level sensor P0500 Vehicle speed sensor 	
	 P0605 P0607 ECM P0643 Sensor power supply P0705 P0850 Park/neutral position (PNP) switch P1550 P1551 P1552 P1553 P1554 Battery current sensor P1610 - P1615 NATS P2122 P2123 P2127 P2128 P2138 Accelerator pedal position sensor 	F
2	 P0031 P0032 P0051 P0052 Air fuel ratio (A/F) sensor 1 heater P0037 P0038 P0057 P0058 Heated oxygen sensor 2 heater P0075 P0081 Intake valve timing control solenoid valve P0078 P0084 Exhaust valve timing control magnet retarder P0130 P0131 P0132 P0133 P0150 P0151 P0152 P0153 P2A00 P2A03 Air fuel ratio (A/F) sensor 1 P0137 P0138 P0139 P0157 P0158 P0159 Heated oxygen sensor 2 	G
	 P0441 EVAP control system purge flow monitoring P0443 P0444 P0445 EVAP canister purge volume control solenoid valve P0447 P0448 EVAP canister vent control valve P0451 P0452 P0453 EVAP control system pressure sensor P0550 Power steering pressure sensor P0603 ECM power supply 	ı
	 P0710 P0717 P0720 P0731 P0732 P0733 P0734 P0735 P0740 P0744 P0745 P1730 P1752 P1757 P1762 P1767 P1772 P1774 A/T related sensors, solenoid valves and switches P1078 P1084 Exhaust valve timing control position sensor P1217 Engine over temperature (OVERHEAT) P1233 P2101 Electric throttle control function P1236 P2118 Throttle control motor P1290 P2100 P2103 Throttle control motor relay 	J
3	 P1805 Brake switch P0011 P0021 Intake valve timing control P0014 P0024 Exhaust valve timing control P0171 P0172 P0174 P0175 Fuel injection system function 	L
	 P0300 - P0306 Misfire P0420 P0430 Three way catalyst function P0442 P0456 EVAP control system (SMALL LEAK, VERY SMALL LEAK) P0455 EVAP control system (GROSS LEAK) P0506 P0507 Idle speed control system 	N
	 P1148 P1168 Closed loop control P1211 TCS control unit P1212 TCS communication line P1238 P2119 Electric throttle control actuator 	N
	 P1421 Cold start control P1564 ICC steering switch / ASCD steering switch P1568 ICC command value P1572 ICC brake switch / ASCD brake switch P1574 ICC vehicle speed sensor / ASCD vehicle speed sensor 	F

DTC Index

×:Applicable —: Not applicable

DTO	C* ¹	ltomo				Deference
CONSULT-III GST* ²	ECM*3	(CONSULT-III screen terms)	SRT code	Trip	MIL	Reference page
U0101	0101*4	LOST COMM (ECM)	_	1	×	EC-147
U0164	0164*4	LOST COMM (HVAC)	_	1	×	EC-148
U1001	1001*4	CAN COMM CIRCUIT	_	2 (with ASCD) 1 or 2 (with ICC)	_	<u>EC-149</u>
P0000	0000	NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED.	_	_	Blinking* ⁷	_
P0011	0011	INT/V TIM CONT-B1	_	2	×	EC-150
P0014	0014	EXH/V TIM CONT-B1	_	2	×	EC-154
P0021	0021	INT/V TIM CONT-B2	_	2	×	EC-150
P0024	0024	EXH/V TIM CONT-B2	_	2	×	EC-154
P0031	0031	A/F SEN1 HTR (B1)	_	2	×	EC-158
P0032	0032	A/F SEN1 HTR (B1)	_	2	×	EC-158
P0037	0037	HO2S2 HTR (B1)	_	2	×	EC-161
P0038	0038	HO2S2 HTR (B1)	_	2	×	EC-161
P0051	0051	A/F SEN1 HTR (B2)	_	2	×	EC-158
P0052	0052	A/F SEN1 HTR (B2)	_	2	×	EC-158
P0057	0057	HO2S2 HTR (B2)	_	2	×	EC-161
P0058	0058	HO2S2 HTR (B2)	_	2	×	EC-161
P0075	0075	INT/V TIM V/CIR-B1	_	2	×	EC-164
P0078	0078	EX V/T ACT/CIRC-B1	_	2	×	EC-167
P0081	0081	INT/V TIM V/CIR-B2	_	2	×	EC-164
P0084	0084	EX V/T ACT/CIRC-B2	_	2	×	EC-167
P0101	0101	MAF SEN/CIRCUIT-B1	_	2	×	EC-170
P0102	0102	MAF SEN/CIRCUIT-B1	_	1	×	EC-177
P0103	0103	MAF SEN/CIRCUIT-B1	_	1	×	EC-177
P010B	010B	MAF SEN/CIRCUIT-B2	_	2	×	EC-170
P010C	010C	MAF SEN/CIRCUIT-B2	_	1	×	EC-177
P010D	010D	MAF SEN/CIRCUIT-B2	_	1	×	EC-177
P0112	0112	IAT SEN/CIRCUIT-B1	_	2	×	EC-183
P0113	0113	IAT SEN/CIRCUIT-B1	_	2	×	EC-183
P0116	0116	ECT SEN/CIRC	_	2	×	EC-186
P0117	0117	ECT SEN/CIRC	_	1	×	EC-188
P0118	0118	ECT SEN/CIRC	_	1	×	EC-188
P0122	0122	TP SEN 2/CIRC-B1	_	1	×	EC-191
P0123	0123	TP SEN 2/CIRC-B1	_	1	×	EC-191
P0125	0125	ECT SENSOR	_	2	×	EC-195
P0127	0127	IAT SENSOR-B1	_	2	×	EC-198
P0128	0128	THERMSTAT FNCTN	_	2	×	EC-200

200 2 (0.1		JRMATION >				[VQJJIIK]	•
DTC)* ¹					D (^
CONSULT-III GST* ²	ECM*3	Items (CONSULT-III screen terms)	SRT code	Trip	MIL	Reference page	Α
P0130	0130	A/F SENSOR1 (B1)	_	2	×	EC-202	EC
P0131	0131	A/F SENSOR1 (B1)	_	2	×	EC-206	
P0132	0132	A/F SENSOR1 (B1)	_	2	×	EC-209	-
P0133	0133	A/F SENSOR1 (B1)	×	2	×	EC-212	С
P0137	0137	HO2S2 (B1)	×	2	×	EC-217	-
P0138	0138	HO2S2 (B1)	×	2	×	EC-223	D
P0139	0139	HO2S2 (B1)	×	2	×	EC-231	
P0150	0150	A/F SENSOR1 (B2)	_	2	×	EC-202	-
P0151	0151	A/F SENSOR1 (B2)	_	2	×	EC-206	Е
P0152	0152	A/F SENSOR1 (B2)	_	2	×	EC-209	=
P0153	0153	A/F SENSOR1 (B2)	×	2	×	EC-212	_
P0157	0157	HO2S2 (B2)	×	2	×	EC-217	F
P0158	0158	HO2S2 (B2)	×	2	×	EC-223	-
P0159	0159	HO2S2 (B2)	×	2	×	EC-231	(
P0171	0171	FUEL SYS-LEAN-B1	_	2	×	EC-237	-
P0172	0172	FUEL SYS-RICH-B1	_	2	×	EC-241	-
P0174	0174	FUEL SYS-LEAN-B2	_	2	×	EC-237	-
P0175	0175	FUEL SYS-RICH-B2	_	2	×	EC-241	-
P0181	0181	FTT SENSOR		2	×	EC-245	
P0182	0182	FTT SEN/CIRCUIT		2	×	EC-248	
P0183	0183	FTT SEN/CIRCUIT		2	×	EC-248	-
P0196	0196	EOT SENSOR		2	×	EC-251	J
P0197	0197	EOT SEN/CIRC	_	2	×	EC-254	=
P0198	0198	EOT SEN/CIRC		2	×	EC-254	k
P0222	0222	TP SEN 1/CIRC-B1		1	×	EC-257	r
P0223	0223	TP SEN 1/CIRC-B1	_	1	×	EC-257	-
P0227	0227	TP SEN 2/CIRC-B2	_	1	×	EC-191	L
P0228	0228	TP SEN 2/CIRC-B2		1	×	EC-191	-
P0300	0300	MULTI CYL MISFIRE	_	2	×	EC-261	
P0301	0301	CYL 1 MISFIRE	_	2	×	EC-261	_ N
P0302	0302	CYL 2 MISFIRE	_	2	×	EC-261	=
P0303	0303	CYL 3 MISFIRE	_	2	×	EC-261	
P0304	0304	CYL 4 MISFIRE		2	×	EC-261	-
P0305	0305	CYL 5 MISFIRE	_	2	×	EC-261	-
P0306	0306	CYL 6 MISFIRE	_	2	×	EC-261	С
P0327	0327	KNOCK SEN/CIRC-B1	_	2	_	EC-267	-
P0328	0328	KNOCK SEN/CIRC-B1	_	2	_	EC-267	F
P0332	0332	KNOCK SEN/CIRC-B2	_	2	_	EC-267	. '
P0333	0333	KNOCK SEN/CIRC-B2		2	_	EC-267	-
P0335	0335	CKP SEN/CIRCUIT	<u> </u>	2	×	EC-270	-
P0340	0340	CMP SEN/CIRC-B1	_	2	×	EC-275	-
P0345	0345	CMP SEN/CIRC-B2		2	×	EC-275	-

DTC	*1	ltomo				Doforer
CONSULT-III GST* ²	ECM* ³	(CONSULT-III screen terms)	SRT code	Trip	MIL	Reference page
P0420	0420	TW CATALYST SYS-B1	×	2	×	EC-281
P0430	0430	TW CATALYST SYS-B2	×	2	×	EC-281
P0441	0441	EVAP PURG FLOW/MON	×	2	×	EC-286
P0442	0442	EVAP SMALL LEAK	×	2	×	EC-291
P0443	0443	PURG VOLUME CONT/V	_	2	×	EC-297
P0444	0444	PURG VOLUME CONT/V	_	2	×	EC-302
P0445	0445	PURG VOLUME CONT/V	_	2	×	EC-302
P0447	0447	VENT CONTROL VALVE	_	2	×	EC-305
P0448	0448	VENT CONTROL VALVE	_	2	×	EC-309
P0451	0451	EVAP SYS PRES SEN	_	2	×	EC-313
P0452	0452	EVAP SYS PRES SEN	_	2	×	EC-317
P0453	0453	EVAP SYS PRES SEN	_	2	×	EC-322
P0455	0455	EVAP GROSS LEAK	_	2	×	EC-328
P0456	0456	EVAP VERY SML LEAK	×* ⁶	2	× or —	EC-334
P0460	0460	FUEL LEV SEN SLOSH	_	2	×	EC-341
P0461	0461	FUEL LEVEL SENSOR	_	2	×	EC-343
P0462	0462	FUEL LEVL SEN/CIRC	_	2	×	EC-345
P0463	0463	FUEL LEVL SEN/CIRC	_	2	×	EC-345
P0500	0500	VEH SPEED SEN/CIRC*5	_	2	×	EC-347
P0506	0506	ISC SYSTEM	_	2	×	EC-349
P0507	0507	ISC SYSTEM	_	2	×	EC-35
P0550	0550	PW ST P SEN/CIRC	_	2	_	EC-353
P0603	0603	ECM BACK UP/CIRCUIT	_	2	×	EC-356
P0605	0605	ECM	_	1 or 2	× or —	EC-358
P0607	0607	ECM	_	1	×	EC-360
P0643	0643	SENSOR POWER/CIRC	_	1	×	EC-36
P0705	0705	T/M RANGE SENSOR A	_	2	×	TM-84
P0710	0710	FLUID TEMP SENSOR A	_	2	×	TM-85
P0717	0717	INPUT SPEED SENSOR A	_	2	×	TM-87
P0720	0720	OUTPUT SPEED SENSOR*5	_	2	×	TM-89
P0729	0729	6GR INCORRECT RATIO	_	2	×	TM-93
P0730	0730	INCORRECT GR RATIO	_	2	×	TM-95
P0731	0731	1GR INCORRECT RATIO*8		2	×	TM-96
P0732	0732	2GR INCORRECT RATIO	_	2	×	TM-98
P0733	0733	3GR INCORRECT RATIO	_	2	×	TM-100
P0734	0734	4GR INCORRECT RATIO	_	2	×	TM-102
P0735	0735	5GR INCORRECT RATIO	_	2	×	TM-104
P0740	0740	TORQUE CONVERTER	_	2	×	TM-106
P0744	0744	TORQUE CONVERTER	_	2	×	TM-108
P0745	0745	PC SOLENOID A	_	2	×	TM-109
P0750	0750	SHIFT SOLENOID A	_	2	×	TM-110
P0775	0775	PC SOLENOID B		2	×	TM-112

_	[VQ35HK]				ORMATION >	10515 INFC	< ECU DIAGN
						;* ¹	DTC
A	Reference page	MIL	Trip	SRT code	Items (CONSULT-III screen terms)	ECM*3	CONSULT-III GST* ²
EC	<u>TM-113</u>	×	2	_	SHIFT	0780	P0780
	<u>TM-114</u>	×	2	_	PC SOLENOID C	0795	P0795
-	EC-364	×	2	_	P-N POS SW/CIRCUIT	0850	P0850
С	EC-367	×	2	_	EXH TIM SEN/CIRC-B1	1078	P1078
-	EC-367	×	2	_	EXH TIM SEN/CIRC-B2	1084	P1084
D	EC-372	×	1	_	CLOSED LOOP-B1	1148	P1148
	EC-372	×	1	_	CLOSED LOOP-B2	1168	P1168
-	EC-373	_	2	_	TCS C/U FUNCTN	1211	P1211
Е	EC-374		2	_	TCS/CIRC	1212	P1212
-	EC-375	×	1	_	ENG OVER TEMP	1217	P1217
F	EC-379	_	2	_	CTP LEARNING-B1	1225	P1225
Г	EC-381	_	2	_	CTP LEARNING-B1	1226	P1226
-	EC-383	×	1	_	ETC FNCTN/CIRC-B2	1233	P1233
G	EC-379	_	2	_	CTP LEARNING-B2	1234	P1234
•	EC-381	_	2	_	CTP LEARNING-B2	1235	P1235
	EC-387	×	1	_	ETC MOT-B2	1236	P1236
- H	EC-390	×	1	_	ETC ACTR-B2	1238	P1238
•	EC-392	×	1	_	TP SENSOR-B2	1239	P1239
	EC-395	×	1	_	ETC MOT PWR-B2	1290	P1290
•	EC-397	×	2	_	COLD START CONTROL	1421	P1421
	EC-399	_	2	_	BAT CURRENT SENSOR	1550	P1550
J	EC-403	_	2	_	BAT CURRENT SENSOR	1551	P1551
•	EC-403	_	2	_	BAT CURRENT SENSOR	1552	P1552
K	EC-408	_	2	_	BAT CURRENT SENSOR	1553	P1553
•	EC-412	_	2	_	BAT CURRENT SENSOR	1554	P1554
L	EC-417 (with ASCD) EC-420 (with ICC)	_	1	_	ASCD SW	1564	P1564
M	EC-423	_	1	_	ICC COMMAND VALUE	1568	P1568
N	EC-424 (with ASCD) EC-430 (with ICC)	_	1	_	ASCD BRAKE SW	1572	P1572
0	EC-437 (with ASCD) EC-439 (with ICC)	_	1	_	ASCD VHL SPD SEN	1574	P1574
Ē	SEC-34	_	2	_	LOCK MODE	1610	P1610
Р	SEC-35	_	2	_	ID DISCORD IMMU-ECM	1611	P1611
-	<u>SEC-37</u>	_	2	_	CHAIN OF ECM-IMMU	1612	P1612
-	SEC-38	_	2	_	CHAIN OF IMMU-KEY	1614	P1614
-	SEC-41	_	2	_	DIFFERENCE OF KEY	1615	P1615
-	TM-119	×	2	_	INTERLOCK	1730	P1730
-	<u>TM-121</u>	×	2	_	7GR INCORRECT RATIO	1734	P1734

DT	·C*1	- Items				Reference
CONSULT-III GST* ²	ECM*3	(CONSULT-III screen terms) SRT code		Trip	MIL	page
P1805	1805	BRAKE SW/CIRCUIT	_	2	_	EC-441
P2100	2100	ETC MOT PWR-B1	_	1	×	EC-395
P2101	2101	ETC FNCTN/CIRC-B1	_	1	×	EC-383
P2103	2103	ETC MOT PWR	_	1	×	EC-395
P2118	2118	ETC MOT-B1	_	1	×	EC-387
P2119	2119	ETC ACTR-B1	_	1	×	EC-390
P2122	2122	APP SEN 1/CIRC	_	1	×	EC-444
P2123	2123	APP SEN 1/CIRC	_	1	×	EC-444
P2127	2127	APP SEN 2/CIRC	_	1	×	EC-448
P2128	2128	APP SEN 2/CIRC	_	1	×	EC-448
P2132	2132	TP SEN 1/CIRC-B2	_	1	×	EC-257
P2133	2133	TP SEN 1/CIRC-B2	_	1	×	EC-257
P2135	2135	TP SENSOR-B1	_	1	×	EC-392
P2138	2138	APP SENSOR	_	1	×	EC-453
P2713	2713	PRESS CONTROL SOL D	_	2	×	<u>TM-130</u>
P2722	2722	PRESS CONTROL SOL E	_	2	×	TM-131
P2731	2731	PRESS CONTROL SOL F	_	2	×	<u>TM-132</u>
P2807	2807	PRESS CONTROL SOL G	_	2	×	<u>TM-133</u>
P2A00	2A00	A/F SENSOR1 (B1)	_	2	×	EC-458
P2A03	2A03	A/F SENSOR1 (B2)	_	2	×	EC-458

^{*1: 1}st trip DTC No. is the same as DTC No.

How to Set SRT Code

INFOID:0000000003856418

To set all SRT codes, self-diagnosis for the items indicated above must be performed one or more times. Each diagnosis may require a long period of actual driving under various conditions.

WITH CONSULT-III

Perform corresponding DTC Confirmation Procedure one by one based on Performance Priority in the table on "SRT Item".

WITHOUT CONSULT-III

The most efficient driving pattern in which SRT codes can be properly set is explained below. The driving pattern should be performed one or more times to set all SRT codes.

^{*2:} This number is prescribed by SAE J2012.

^{*3:} In Diagnostic Test Mode II (Self-diagnostic results), this number is controlled by NISSAN.

^{*4:} The troubleshooting for this DTC needs CONSULT-III.

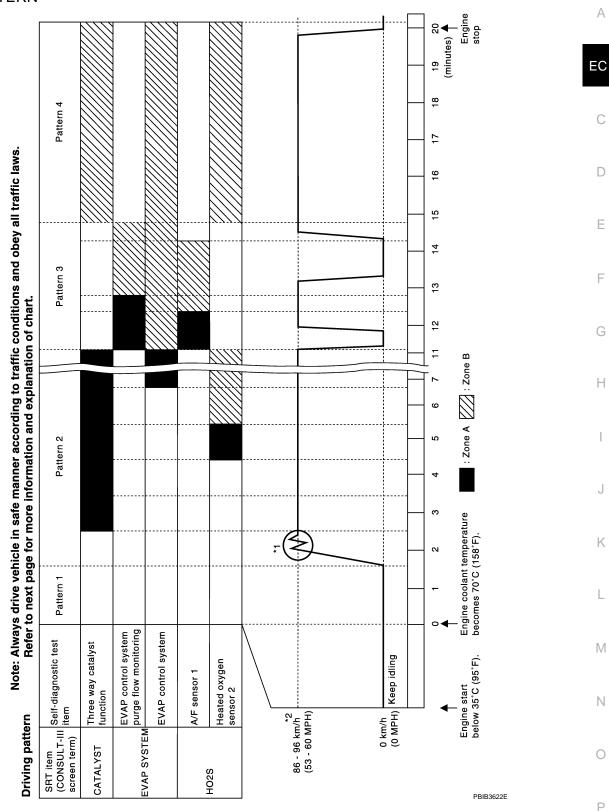
^{*5:} When the fail-safe operations for both self-diagnoses occur, the MIL illuminates.

^{*6:} SRT code will not be set if the self-diagnostic result is NG.

^{*7:} When the ECM is in the mode that displays SRT status, MIL may blink. For the details, refer to "How to Display SRT Status".

^{*8:} When erasing this DTC, always use CONSULT-III or GST.

DRIVING PATTERN



 The time required for each diagnosis varies with road surface conditions, weather, altitude, individual driving habits, etc.

Zone A refers to the range where the time, required for the diagnosis under normal conditions*, is the shortest.

Zone B refers to the range where the diagnosis can still be performed if the diagnosis is not completed within zone A.

*: Normal conditions refer to the following:

INFOID:0000000003856419

- Sea level
- Flat road
- Ambient air temperature: 20 30°C (68 86°F)
- Diagnosis is performed as quickly as possible under normal conditions.
 Under different conditions [For example: ambient air temperature other than 20 30°C (68 86°F)], diagnosis may also be performed.

Pattern 1:

- The engine is started at the engine coolant temperature of -10 to 35°C (14 to 95°F) (where the voltage between the ECM terminal 71 and ground is 3.0 4.3 V).
- The engine must be operated at idle speed until the engine coolant temperature is greater than 70°C (158°F) (where the voltage between the ECM terminal 71 and ground is lower than 1.4 V).
- The engine is started at the fuel tank temperature of warmer than 0°C (32°F) (where the voltage between the ECM terminal 106 and ground is less than 4.1 V).

Pattern 2:

• When steady-state driving is performed again even after it is interrupted, each diagnosis can be conducted. In this case, the time required for diagnosis may be extended.

Pattern 3:

- Operate vehicle following the driving pattern shown in the figure.
- Release the accelerator pedal during deceleration of vehicle speed from 90 km/h (56 MPH) to 0 km/h (0 MPH).

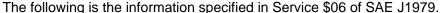
Pattern 4:

- The accelerator pedal must be held very steady during steadystate driving.
- If the accelerator pedal is moved, the test must be conducted again.
- *1: Depress the accelerator pedal until vehicle speed is 90 km/h (56 MPH), then release the accelerator pedal and keep it released for more than 10 seconds. Depress the accelerator pedal until vehicle speed is 90 km/h (56 MPH) again.
- *2: Checking the vehicle speed with GST is advised.



Set the selector lever position in the D with the overdrive switch turned ON.

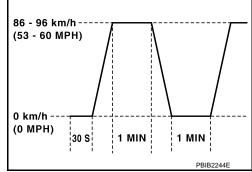
Test Value and Test Limit



The test value is a parameter used to determine whether a system/circuit diagnostic test is OK or NG while being monitored by the ECM during self-diagnosis. The test limit is a reference value which is specified as the maximum or minimum value and is compared with the test value being monitored.

These data (test value and test limit) are specified by On Board Monitor ID(OBDMID), Test ID (TID), Unit and Scaling ID and can be displayed on the GST screen.

The items of the test value and test limit will be displayed with GST screen which items are provided by the ECM. (eg., if bank 2 is not applied on this vehicle, only the items of bank 1 are displayed)



Α

D

Е

F

Н

Item	OBD-	Self-diagnostic test item	DTC	lii	e and Test mit display)	Description
	MID	och diagnosiic test item		TID	Unitand Scaling ID	Description
			P0131	83H	0BH	Minimum sensor output voltage for test cycle
			P0131	84H	0BH	Maximum sensor output voltage for tes cycle
			P0130	85H	0BH	Minimum sensor output voltage for test cycle
	01H	Air fuel ratio (A/F) sensor 1	P0130	86H	0BH	Maximum sensor output voltage for tes cycle
		(Bank 1)	P0133	87H	04H	Response rate: Response ratio (Lean to Rich)
			P0133	88H	04H	Response rate: Response ratio (Rich to Lean)
		P2A00 8AH 84H The amount of s	The amount of shift in air fuel ratio			
			P2A00	8AH	84H	The amount of shift in air fuel ratio
102S			P0130	8BH	0BH	Difference in sensor output voltage
			P0133	8CH	83H	Response gain at the limited frequency
			P0138	07H	0CH	Minimum sensor output voltage for test cycle
	02H	Heated oxygen sensor 2 (Bank 1)	P0137	08H	0CH	Maximum sensor output voltage for test cycle
			P0138	80H	0CH	Sensor output voltage
			P0139	81H	0CH	Difference in sensor output voltage
			P0143	07H	0CH	Minimum sensor output voltage for test cycle
	03H	Heated oxygen sensor 3 (Bank 1)	P0144	08H	0CH	Maximum sensor output voltage for test cycle
			P0146	80H	0CH	Sensor output voltage
			P0145	81H	0CH	Difference in sensor output voltage

 \mathbb{N}

Κ

Ν

0

Ρ

			ECIVI			D/00511D
< ECU D	IAGNO	OSIS INFORMATION >				[VQ35HR]
ltom	OBD-	Solf diagnostic test item	DTC	li	e and Test mit display)	Deparintion
Item	MID	Self-diagnostic test item	Dic	TID	Unit and Scaling ID	Description
			P0151	83H	0BH	Minimum sensor output voltage for test cycle
			P0151	84H	0BH	Maximum sensor output voltage for test cycle
			P0150	85H	0BH	Minimum sensor output voltage for test cycle
		Air fuel ratio (A/F) sensor 1	P0150	86H	0BH	Maximum sensor output voltage for test cycle
	05H	(Bank 2)	P0153	87H	04H	Response rate: Response ratio (Lean to Rich)
			P0153	88H	04H	Response rate: Response ratio (Rich to Lean)
			P2A03	89H	84H	The amount of shift in air fuel ratio
			P2A03	8AH	84H	The amount of shift in air fuel ratio
HO2S			P0150	8BH	0BH	Difference in sensor output voltage
			P0153	8CH	83H	Response gain at the limited frequency
		Heated oxygen sensor 2 (Bank 2)	P0158	07H	0CH	Minimum sensor output voltage for test cycle
	06H		P0157	08H	0CH	Maximum sensor output voltage for test cycle
			P0158	80H	0CH	Sensor output voltage
			P0159	81H	0CH	Difference in sensor output voltage
			P0163	07H	0CH	Minimum sensor output voltage for test cycle
	07H	Heated oxygen sensor 3 (Bank2)	P0164	08H	0CH	Maximum sensor output voltage for tes cycle
			P0166	80H	0CH	Sensor output voltage
			P0165	81H	0CH	Difference in sensor output voltage
			P0420	80H	01H	O2 storage index
	21H	Three way catalyst function	P0420	82H	01H	Switching time lag engine exhaust index value
	2111	(Bank1)	P2423	83H	0CH	Difference in 3rd O2 sensor output volt age
CATA-			P2423	84H	84H	O2 storage index in HC trap catalyst
LYST			P0430	80H	01H	O2 storage index
	22H	Three way catalyst function	P0430	82H	01H	Switching time lag engine exhaust index value
		(Bank2)	P2424	83H	0CH	Difference in 3rd O2 sensor output volt age
			P2424	84H	84H	O2 storage index in HC trap catalyst

< ECO D	IAGING	OSIS INFORMATION >				[VQ35HK]
					e and Test	
14	OBD-	Oalf diamand to the first	DTO		mit display)	Describer.
Item	MID	Self-diagnostic test item	DTC	TID	Unitand Scaling ID	Description
			P0400	80H	96H	Low Flow Faults: EGR temp change rate (short term)
			P0400	81H	96H	Low Flow Faults: EGR temp change rate (long term)
EGR SYSTEM	31H	EGR function	P0400	82H	96H	Low Flow Faults: Difference between max EGR temp and EGR temp under idling condition
			P0400	83H	96H	Low Flow Faults: Max EGR temp
			P1402	84H	96H	High Flow Faults: EGR temp increase rate
			P0011	80H	9DH	VTC intake function diagnosis (VTC alignment check diagnosis)
	35H	VVT Monitor (Bank1)	P0014	81H	9DH	VTC exhaust function diagnosis (VTC alignment check diagnosis)
	3311	VVI Monitor (Bankr)	P0011	82H	9DH	VTC intake function diagnosis (VTC drive failure diagnosis)
VVT			P0014	83H	9DH	VTC exhaust function diagnosis (VTC drive failure diagnosis)
SYSTEM			P0021	80H	9DH	VTC intake function diagnosis (VTC alignment check diagnosis)
	36H	VVT Monitor (Bank2)	P0024	81H	9DH	VTC exhaust function diagnosis (VTC alignment check diagnosis)
	υп	VVI WORKO (Barkz)	P0021	82H	9DH	VTC intake function diagnosis (VTC drive failure diagnosis)
			P0024	83H	9DH	VTC exhaust function diagnosis (VTC drive failure diagnosis)
	39H	EVAP control system leak (Cap Off)	P0455	80H	0CH	Difference in pressure sensor output voltage before and after pull down
	3ВН	EVAP control system leak (Small leak)	P0442	80H	05H	Leak area index (for more than 0.04 inch)
EVAP SYSTEM	3СН	EVAP control system leak	P0456	80H	05H	Leak area index (for more than 0.02 inch)
	30П	(Very small leak)	P0456	81H	FDH	Maximum internal pressure of EVAP system during monitoring
	3DH	Purge flow system	P0441	83H	0CH	Difference in pressure sensor output voltage before and after vent control valve close
	41H	A/F sensor 1 heater (Bank 1)	Low Input:P0031 High Input:P0032	81H	овн	Converted value of Heater electric current to voltage
	42H	Heated oxygen sensor 2 heater (Bank 1)	Low Input:P0037 High Input:P0038	80H	0CH	Converted value of Heater electric current to voltage
O2 SEN- SOR	43H	Heated oxygen sensor 3 heater (Bank 1)	P0043	80H	0CH	Converted value of Heater electric current to voltage
HEATER	45H	A/F sensor 1 heater (Bank 2)	Low Input:P0051 High Input:P0052	81H	0BH	Converted value of Heater electric current to voltage
	46H	Heated oxygen sensor 2 heater (Bank 2)	Low Input:P0057 High Input:P0058	80H	0CH	Converted value of Heater electric current to voltage
	47H	Heated oxygen sensor 3 heater (Bank 2)	P0063	80H	0CH	Converted value of Heater electric cur- rent to voltage

Item	OBD-	Self-diagnostic test item	DTC -	Test value and Test limit (GST display)		Description	
item	MID			TID	Unitand Scaling ID	Description	
		H Secondary Air system	P0411	80H	01H	Secondary Air Injection System Incorrect Flow Detected	
			Bank1: P0491 Bank2: P0492	81H	01H	Secondary Air Injection System Insufficient Flow	
	71H		P2445	82H	01H	Secondary Air Injection System Pump Stuck Off	
SEC- OND- ARY AIR			P2448	83H	01H	Secondary Air Injection System High Airflow	
7			Bank1: P2440 Bank2: P2442	84H	01H	Secondary Air Injection System Switching Valve Stuck Open	
			P2440	85H	01H	Secondary Air Injection System Switching Valve Stuck Open	
			P2444	86H	01H	Secondary Air Injection System Pump Stuck On	
	81H	Fuel injection system function	P0171 or P0172	80H	2FH	Long term fuel trim	
FUEL	0111	(Bank 1)	P0171 or P0172	81H	24H	The number of lambda control clamped	
SYSTEM	82H	Fuel injection system function	P0174 or P0175	80H	2FH	Long term fuel trim	
	82H	(Bank 2)	P0174 or P0175	81H	24H	The number of lambda control clamped	

	OBD-			li	e and Test mit display)			
Item MID		Self-diagnostic test item	DTC	TID	Unitand Scaling ID	Description		
			P0301	80H	24H	Misfiring counter at 1000 revolution of the first cylinder		
			P0302	81H	24H	Misfiring counter at 1000 revolution of the second cylinder		
			P0303	82H	24H	Misfiring counter at 1000 revolution of the third cylinder		
			P0304	83H	24H	Misfiring counter at 1000 revolution of the fourth cylinder		
			P0305	84H	24H	Misfiring counter at 1000 revolution of the fifth cylinder		
		A1H Multiple Cylinder Misfires	P0306	85H	24H	Misfiring counter at 1000 revolution of the sixth cylinder		
			P0307	86H	24H	Misfiring counter at 1000 revolution of the seventh cylinder		
			P0308	87H	24H	Misfiring counter at 1000 revolution of the eighth cylinder		
				Multiple Collings Minfred	P0300	88H	24H	Misfiring counter at 1000 revolution of the multiple cylinders
					P0301	89H	24H	Misfiring counter at 200 revolution of the first cylinder
MISFIRE	A1H		P0302	8AH	24H	Misfiring counter at 200 revolution of the second cylinder		
			P0303	8BH	24H	Misfiring counter at 200 revolution of the third cylinder		
			P0304	8CH	24H	Misfiring counter at 200 revolution of the fourth cylinder		
			P0305	8DH	24H	Misfiring counter at 200 revolution of the fifth cylinder		
			P0306	8EH	24H	Misfiring counter at 200 revolution of the sixth cylinder		
			P0307	8FH	24H	Misfiring counter at 200 revolution of the seventh cylinder		
			P0308	90H	Misfiring counter at 2	Misfiring counter at 200 revolution of the eighth cylinder		
			P0300	91H	24H	Misfiring counter at 1000 revolution of the single cylinder		
			P0300	92H	24H	Misfiring counter at 200 revolution of the single cylinder		
			P0300	93H	24H	Misfiring counter at 200 revolution of the multiple cylinders		

	OBD-	Self-diagnostic test item	D.T.O.	li	e and Test mit display)	
Item	MID		DTC	TID	Unit and Scaling ID	Description
	A2H	No. 1 Cylinder Misfire	P0301	ОВН	24H	EWMA (Exponential Weighted Moving Average) misfire counts for last 10 driving cycles
			P0301	0CH	24H	Misfire counts for last/current driving cy cles
	АЗН	No. 2 Cylinder Misfire	P0302	0BH	24H	EWMA (Exponential Weighted Moving Average) misfire counts for last 10 driv- ing cycles
			P0302	0CH	24H	Misfire counts for last/current driving cy cles
	A4H	No. 3 Cylinder Misfire	P0303	0BH	24H	EWMA (Exponential Weighted Moving Average) misfire counts for last 10 driving cycles
			P0303	0CH	24H	Misfire counts for last/current driving cy cles
	A5H	No. 4 Cylinder Misfire	P0304	ОВН	24H	EWMA (Exponential Weighted Moving Average) misfire counts for last 10 driving cycles
MOSIDE			P0304	0CH	24H	Misfire counts for last/current driving cy cles
MISFIRE	A6H	No. 5 Cylinder Misfire	P0305	0BH	24H	EWMA (Exponential Weighted Moving Average) misfire counts for last 10 driv- ing cycles
			P0305	0CH	24H	Misfire counts for last/current driving cy cles
	А7Н	No. 6 Cylinder Misfire	P0306	ОВН	24H	EWMA (Exponential Weighted Moving Average) misfire counts for last 10 driving cycles
		,	P0306	0CH	24H	Misfire counts for last/current driving cy cles
	A8H	No. 7 Cylinder Misfire	P0307	ОВН	24H	EWMA (Exponential Weighted Moving Average) misfire counts for last 10 driving cycles
		·	P0307	0CH	24H	Misfire counts for last/current driving cy cles
	А9Н	No. 8 Cylinder Misfire	P0308	0BH	24H	EWMA (Exponential Weighted Moving Average) misfire counts for last 10 driv- ing cycles
			P0308	0CH	24H	Misfire counts for last/current driving cy cles

ENGINE CONTROL SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

[VQ35HR]

SYMPTOM DIAGNOSIS

ENGINE CONTROL SYSTEM SYMPTOMS

Symptom Table INFOID:0000000003856420 EC

SYSTEM — BASIC ENGINE CONTROL SYSTEM

		SYMPTOM													
		HARD/NO START/RESTART (EXCP. HA)	ENGINE STALL	HESITATION/SURGING/FLAT SPOT	SPARK KNOCK/DETONATION	LACK OF POWER/POOR ACCELERATION	HIGH IDLE/LOW IDLE	ROUGH IDLE/HUNTING	IDLING VIBRATION	SLOW/NO RETURN TO IDLE	OVERHEATS/WATER TEMPERATURE HIGH	EXCESSIVE FUEL CONSUMPTION	EXCESSIVE OIL CONSUMPTION	BATTERY DEAD (UNDER CHARGE)	Reference page
Warrant	y symptom code	AA	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	НА	
Fuel	Fuel pump circuit	1	1	2	3	2		2	2			3		2	EC-475
	Fuel pressure regulator system	3	3	4	4	4	4	4	4	4		4			EC-567
	Fuel injector circuit	1	1	2	3	2		2	2			2			EC-472
	Evaporative emission system	3	3	4	4	4	4	4	4	4		4			EC-84
Air	Positive crankcase ventilation system	3	3	4	4	4	4	4	4	4		4	1		EC-494
	Incorrect idle speed adjustment						1	1	1	1		1			EC-20
	Electric throttle control actuator	1	1	2	3	3	2	2	2	2		2		2	EC-383, EC-390
Ignition	Incorrect ignition timing adjustment	3	3	1	1	1		1	1			1			EC-20
	Ignition circuit	1	1	2	2	2		2	2			2			EC-482
Main po	wer supply and ground circuit	2	2	3	3	3		3	3		2	3			EC-144
Mass ai	r flow sensor circuit	1			2										EC-170, EC-177
Engine	coolant temperature sensor circuit						3			3					EC-188, EC-195
Air fuel ratio (A/F) sensor 1 circuit			1	2	3	2		2	2			2			EC-202, EC-206, EC-209, EC-212, EC-458
Throttle position sensor circuit							2			2					EC-191, EC-257, EC-379, EC-381, EC-392
Accelera	ator pedal position sensor circuit			3	2	1									EC-444, EC-448, EC-453
Knock s	sensor circuit			2								3			EC-267

EC-555 Revision: 2009 March 2009 FX35/FX50

Α

D

Е

F

Н

Κ

M

L

Ν

0

Р

						S١	/MPT	ОМ						
	HARD/NO START/RESTART (EXCP. HA)	ENGINE STALL	HESITATION/SURGING/FLAT SPOT	SPARK KNOCK/DETONATION	LACK OF POWER/POOR ACCELERATION	HIGH IDLE/LOW IDLE	ROUGH IDLE/HUNTING	IDLING VIBRATION	SLOW/NO RETURN TO IDLE	OVERHEATS/WATER TEMPERATURE HIGH	EXCESSIVE FUEL CONSUMPTION	EXCESSIVE OIL CONSUMPTION	BATTERY DEAD (UNDER CHARGE)	Reference page
Warranty symptom code	AA	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	НА	
Engine oil temperature sensor			4		2						3			EC-251, EC-254
Crankshaft position sensor circuit	2	2												EC-270
Camshaft position sensor circuit	3	2												EC-275
Vehicle speed signal circuit		2	3		3						3			EC-347
Power steering pressure sensor circuit		2					3	3						EC-353
ECM	2	2	3	3	3	3	3	3	3	3	3			EC-356, EC-358
Intake valve timing control solenoid valve circuit		3	2		1	3	2	2	3		3			EC-164
Exhaust valve timing control magnet retarder circuit		3	2		1	3	2	2	3		3			EC-167
PNP signal circuit			3		3		3	3			3			EC-364
Refrigerant pressure sensor circuit		2				3			3		4			EC-496
Electrical load signal circuit							3							EC-470
Air conditioner circuit	2	2	3	3	3	3	3	3	3		3		2	<u>HA-4</u>
ABS actuator and electric unit (control unit)			4											BRC-5

^{1 - 6:} The numbers refer to the order of inspection. (continued on next figure)

SYSTEM — ENGINE MECHANICAL & OTHER

ENGINE CONTROL SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS > [VQ35HR]

							S\	/MPT	ОМ							Α
		P. HA)		TC		ERATION					'URE HIGH	N		jE)		EC
		START/RESTART (EXCP.		IG/FLAT SPOT	ONATION	OF POWER/POOR ACCELERATION		97		O IDLE	OVERHEATS/WATER TEMPERATURE	EXCESSIVE FUEL CONSUMPTION	CONSUMPTION	BATTERY DEAD (UNDER CHARGE)	Reference	С
			STALL	HESITATION/SURGING/FLAT	SPARK KNOCK/DETONATION	POWER/PC	HIGH IDLE/LOW IDLE	ROUGH IDLE/HUNTING	IDLING VIBRATION	SLOW/NO RETURN TO IDLE	ATS/WATER	VE FUEL CO	OIL	DEAD (UNI	page	D
		HARD/NO	ENGINE STALL	HESITATI	SPARK KI	LACK OF	HIGH IDL	ROUGHII	IDLING VI	SLOW/NC	OVERHE/	EXCESSI	EXCESSIVE	BATTERY		Е
Warranty s	symptom code	AA	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	НА		F
Fuel	Fuel tank	5													<u>FL-15</u>	
	Fuel piping	Ů		5	5	5		5	5			5			<u>EM-45</u>	
	Vapor lock		5												_	G
	Valve deposit	_		_	_	_		_	_			_			_	
	Poor fuel (Heavy weight gasoline, Low octane)	5		5	5	5		5	5			5			_	Н
Air	Air duct														EM-30	
	Air cleaner														EM-30	
	Air leakage from air duct (Mass air flow sensor — electric throttle control actuator)		5	5		5		5	5			5			<u>EM-30</u>	
	Electric throttle control actuator	5			5		5			5					EM-31	
	Air leakage from intake manifold/ Collector/Gasket														EM-35	K
Cranking	Battery														PG-120	
	Generator circuit	1	1	1		1		1	1			1		1	CHG-22, CHG-23	L
	Starter circuit	3										'			STR-20	
	Signal plate	6													<u>EM-126</u>	IV A
	PNP signal	4													<u>TM-84</u>	M
Engine	Cylinder head	5	5	5	5	5		5	5			5			<u>EM-114</u>	
	Cylinder head gasket										4		3	-		Ν
	Cylinder block															
	Piston												4			
	Piston ring	6	6	6	6	6		6	6			6		-	<u>EM-126</u>	О
	Connecting rod			0	0				О							
	Bearing															Р
	Crankshaft															

Revision: 2009 March **EC-557** 2009 FX35/FX50

							S	/MPT	ОМ						
		HARD/NO START/RESTART (EXCP. HA)	ENGINE STALL	HESITATION/SURGING/FLAT SPOT	SPARK KNOCK/DETONATION	LACK OF POWER/POOR ACCELERATION	HIGH IDLE/LOW IDLE	ROUGH IDLE/HUNTING	IDLING VIBRATION	SLOW/NO RETURN TO IDLE	OVERHEATS/WATER TEMPERATURE HIGH	EXCESSIVE FUEL CONSUMPTION	EXCESSIVE OIL CONSUMPTION	BATTERY DEAD (UNDER CHARGE)	Reference page
Warranty s	symptom code	AA	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	НА	
Valve mecha- nism	Timing chain Camshaft Intake valve timing control Exhaust valve timing control Intake valve	5	5	5	5	5		5	5			5			EM-68 EM-68 EM-68
	Exhaust valve												3		<u>EM-114</u>
Exhaust	Exhaust manifold/Tube/Muffler/ Gasket Three way catalyst	5	5	5	5	5		5	5			5			EM-38, EX-5
Lubrica- tion	Oil pan/Oil strainer/Oil pump/Oil filter/Oil gallery/Oil cooler Oil level (Low)/Filthy oil	5	5	5	5	5		5	5			5			EM-49, LU-12, LU- 10, LU-12 LU-6
Cooling	Radiator/Hose/Radiator filler cap Thermostat Water pump Water gallery Cooling fan Coolant level (Low)/Contaminated coolant	5	5	5	5	5		5	5	5	4	5			CO-12, CO-12 CO-23 CO-21 CO-25 CO-18
IVIS (INFII NATS)	NITI Vehicle Immobilizer System —	1	1												SEC-5

^{1 - 6:} The numbers refer to the order of inspection.

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS > [VQ35HR]

NORMAL OPERATING CONDITION

Description INFOID:0000000003856421

FUEL CUT CONTROL (AT NO LOAD AND HIGH ENGINE SPEED)

If the engine speed is above 1,800 rpm under no load (for example, the selector lever position is neutral and engine speed is over 1,800 rpm) fuel will be cut off after some time. The exact time when the fuel is cut off varies based on engine speed.

Fuel cut will be operated until the engine speed reaches 1,500 rpm, then fuel cut will be cancelled. **NOTE:**

This function is different from deceleration control listed under Multiport Fuel Injection (MFI) System, <u>EC-39</u>. "System Description".

EC

Α

С

D

Е

F

<u>_</u>

Н

. I

Κ

L

M

Ν

0

Р

< PRECAUTION > [VQ35HR]

PRECAUTION

PRECAUTIONS

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the "SRS AIR BAG" and "SEAT BELT" of this Service Manual.

WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the "SRS AIR BAG".
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

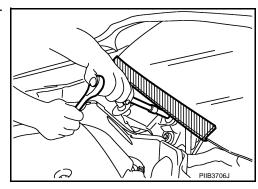
WARNING:

- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.

Precaution for Procedure without Cowl Top Cover

INFOID:0000000003856423

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc.



Precautions For Xenon Headlamp Service

INFOID:0000000003856424

WARNING:

Comply with the following warnings to prevent any serious accident.

- Disconnect the battery cable (negative terminal) or the power supply fuse before installing, removing, or touching the xenon headlamp (bulb included). The xenon headlamp contains high-voltage generated parts.
- Never work with wet hands.
- Check the xenon headlamp ON-OFF status after assembling it to the vehicle. Never turn the xenon headlamp ON in other conditions. Connect the power supply to the vehicle-side connector. (Turning it ON outside the lamp case may cause fire or visual impairments.)
- Never touch the bulb glass immediately after turning it OFF. It is extremely hot.

[VQ35HR] < PRECAUTION >

CAUTION:

Comply with the following cautions to prevent any error and malfunction.

- Install the xenon bulb securely. (Insufficient bulb socket installation may melt the bulb, the connector, the housing, etc. by high-voltage leakage or corona discharge.)
- Never perform HID circuit inspection with a tester.
- Never touch the xenon bulb glass with hands. Never put oil and grease on it.
- Dispose of the used xenon bulb after packing it in thick vinyl without breaking it.
- Never wipe out dirt and contamination with organic solvent (thinner, gasoline, etc.).

On Board Diagnostic (OBD) System of Engine and A/T

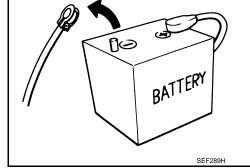
The ECM has an on board diagnostic system. It will illuminate the malfunction indicator lamp (MIL) to warn the driver of a malfunction causing emission deterioration.

CAUTION:

- Always turn the ignition switch OFF and disconnect the negative battery cable before any repair or inspection work. The open/short circuit of related switches, sensors, solenoid valves, etc. will cause the MIL to illuminate.
- Always connect and lock the connectors securely after work. A loose (unlocked) connector will cause the MIL to illuminate due to the open circuit. (Be sure the connector is free from water, grease, dirt, bent terminals, etc.)
- Certain systems and components, especially those related to OBD, may use a new style slide-locking type harness connector. For description and how to disconnect, refer to PG-110, "Description".
- Always route and secure the harnesses properly after work. The interference of the harness with a bracket, etc. may cause the MIL to illuminate due to the short circuit.
- Always connect rubber tubes properly after work. A misconnected or disconnected rubber tube may cause the MIL to illuminate due to the malfunction of the EVAP system or fuel injection system, etc.
- Always erase the unnecessary malfunction information (repairs completed) from the ECM and TCM (Transmission control module) before returning the vehicle to the customer.

General Precautions

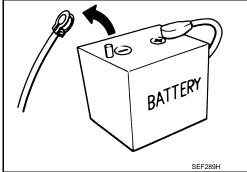
- Always use a 12 volt battery as power source.
- Never attempt to disconnect battery cables while engine is running.
- Before connecting or disconnecting the ECM harness connector, turn ignition switch OFF and disconnect negative battery cable. Failure to do so may damage the ECM because battery voltage is applied to ECM even if ignition switch is turned OFF.
- Before removing parts, turn ignition switch OFF and then disconnect battery ground cable.

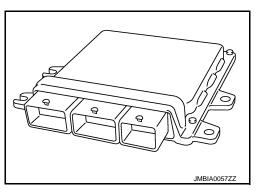


- Never disassemble ECM.
- If a battery cable is disconnected, the memory will return to the ECM value.

The ECM will now start to self-control at its initial value. Engine operation can vary slightly when the terminal is disconnected. However, this is not an indication of a malfunction. Never replace parts because of a slight variation.

- If the battery is disconnected, the following emission-related diagnostic information will be lost within 24 hours.
- Diagnostic trouble codes
- 1st trip diagnostic trouble codes
- Freeze frame data
- 1st trip freeze frame data
- System readiness test (SRT) codes
- Test values





EC

Α

INFOID:0000000003856425

INFOID:0000000003856426

D

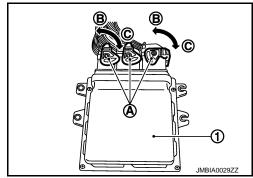
Е

M

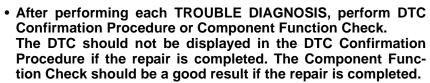
N

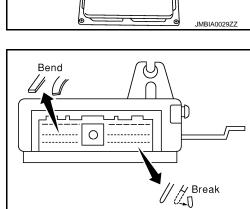
< PRECAUTION > [VQ35HR]

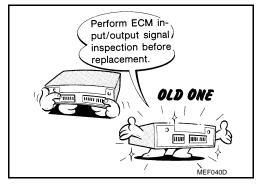
- When connecting ECM harness connector (A), fasten (B) it securely with a lever as far as it will go as shown in the figure.
 - 1. ECM
 - C. Loosen



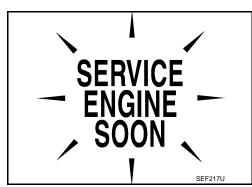
- When connecting or disconnecting pin connectors into or from ECM, never damage pin terminals (bends or break).
 Make sure that there are not any bends or breaks on ECM pin terminal, when connecting pin connectors.
- Securely connect ECM harness connectors.
 A poor connection can cause an extremely high (surge) voltage to develop in coil and condenser, thus resulting in damage to ICs.
- Keep engine control system harness at least 10 cm (4 in) away from adjacent harness, to prevent engine control system malfunctions due to receiving external noise, degraded operation of ICs, etc.
- · Keep engine control system parts and harness dry.
- Before replacing ECM, perform ECM Terminals and Reference Value inspection and make sure ECM functions properly. Refer to EC-501, "Reference Value".
- Handle mass air flow sensor carefully to avoid damage.
- Never clean mass air flow sensor with any type of detergent.
- · Never disassemble electric throttle control actuator.
- Even a slight leak in the air intake system can cause serious incidents.
- Never shock or jar the camshaft position sensor, crankshaft position sensor.







PRIBOO90E

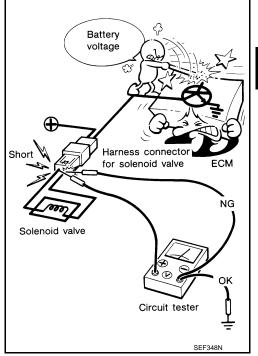


< PRECAUTION > [VQ35HR]

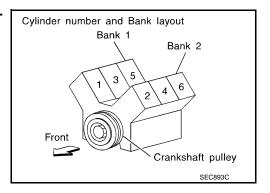
 When measuring ECM signals with a circuit tester, never allow the two tester probes to contact.

Accidental contact of probes will cause a short circuit and damage the ECM power transistor.

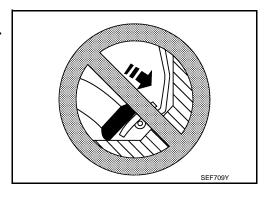
 Never use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.



- B1 indicates bank 1, B2 indicates bank 2 as shown in the figure.
- Never operate fuel pump when there is no fuel in lines.
- Tighten fuel hose clamps to the specified torque.



- · Never depress accelerator pedal when starting.
- Immediately after starting, never rev up engine unnecessarily.
- Never rev up engine just prior to shutdown.



Α

EC

С

D

Е

F

Н

1

.

K

M

Ν

0

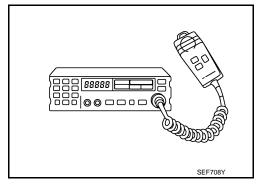
Ρ

PRECAUTIONS

< PRECAUTION > [VQ35HR]

 When installing C.B. ham radio or a mobile phone, be sure to observe the following as it may adversely affect electronic control systems depending on installation location.

- Keep the antenna as far as possible from the electronic control units.
- Keep the antenna feeder line more than 20 cm (8 in) away from the harness of electronic controls.
 Never let them run parallel for a long distance.
- Adjust the antenna and feeder line so that the standing-wave ratio can be kept smaller.
- Be sure to ground the radio to vehicle body.



PREPARATION

[VQ35HR] < PREPARATION >

PREPARATION

PREPARATION

Special Service Tools

INFOID:0000000003856427

INFOID:0000000003856428

NOTE:

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name		Description
(J-44321) Fuel pressure gauge kit	LEC642	Checks fuel pressure

Commercial Service Tools

Tool name (Kent-Moore No.)		Description
Leak detector i.e.: (J-41416)	S-N1703	Locates the EVAP leak
EVAP service port adapter .e.: (J-41413-OBD)	3-141703	Applys positive pressure through EVAP service port
Fuel filler cap adapter .e.: (MLR-8382)	S-NT704	Checks fuel tank vacuum relief valve opening pressure
.e (MEN-0302)	S-NT815	pressure
Socket wrench	19 mm (0.75 in) Nore than 32 mm (1.26 in)	Removes and installs engine coolant temperature sensor

EC-565 Revision: 2009 March 2009 FX35/FX50

S-NT705

EC

C

D

Α

Е

PREPARATION

< PREPARATION > [VQ35HR]

Tool name (Kent-Moore No.)		Description
Oxygen sensor thread cleaner i.e.: (J-43897-18) (J-43897-12)	a Mating b surface shave cylinder	Reconditions the exhaust system threads before installing a new oxygen sensor. Use with antiseize lubricant shown below. a: 18 mm diameter with pitch 1.5 mm for Zirconia Oxygen Sensor b: 12 mm diameter with pitch 1.25 mm for Titania Oxygen Sensor
Anti-seize lubricant i.e.: (Permatex TM 133AR or equivalent meeting MIL specifica- tion MIL-A-907)	S-NT779	Lubricates oxygen sensor thread cleaning tool when reconditioning exhaust system threads.

PERIODIC MAINTENANCE

FUEL PRESSURE

Inspection INFOID:000000003856429

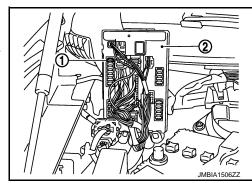
FUEL PRESSURE RELEASE

(II) With CONSULT-III

- 1. Turn ignition switch ON.
- Perform "FUEL PRESSURE RELEASE" in "WORK SUPPORT" mode with CONSULT-III.
- 3. Start engine.
- 4. After engine stalls, crank it 2 or 3 times to release all fuel pressure.
- Turn ignition switch OFF.

Without CONSULT-III

- 1. Remove fuel pump fuse (1) located in IPDM E/R (2).
- 2. Start engine.
- After engine stalls, crank it 2 or 3 times to release all fuel pressure.
- Turn ignition switch OFF.
- 5. Reinstall fuel pump fuse after servicing fuel system.



FUEL PRESSURE CHECK

CAUTION:

Before disconnecting fuel line, release fuel pressure from fuel line to eliminate danger. NOTE:

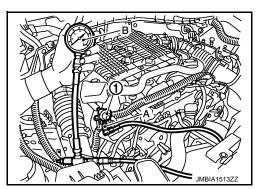
- Prepare pans or saucers under the disconnected fuel line because the fuel may spill out. The fuel
 pressure cannot be completely released because S51 models do not have fuel return system.
- Use Fuel Pressure Gauge Kit [SST:(J-44321)] to check fuel pressure.
- 1. Release fuel pressure to zero.
- 2. Install the inline fuel quick disconnect fitting (A) between fuel damper (1) and injector tube.
- 3. Connect the fuel pressure test gauge (with quick connector adapter hose) (B) to the inline fuel quick disconnect fitting.
- 4. Turn ignition switch ON and check for fuel leakage.
- Start engine and check for fuel leakage.
- Read the indication of fuel pressure gauge.

At idling : Approximately 350 kPa (3.57 kg/cm², 51 psi)

7. If result is unsatisfactory, check fuel hoses and fuel tubes for clogging.

If OK, Replace "fuel filter and fuel pump assembly".

If NG, Repair or replace malfunctioning part.



Revision: 2009 March **EC-567** 2009 FX35/FX50

EC

Α

D

Е

F

G

Н

K

M

Ν

0

Р

EVAP LEAK CHECK

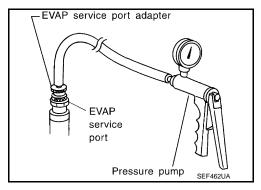
Inspection INFOID:000000003856430

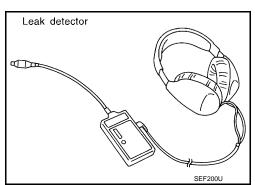
CAUTION:

- Never use compressed air or a high pressure pump.
- Never exceed 4.12 kPa (0.042 kg/cm², 0.6 psi) of pressure in EVAP system.
- Do not start engine.
- Improper installation of EVAP service port adapter (commercial service tool) to the EVAP service port may cause a leak.

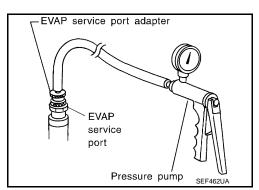
(P) WITH CONSULT-III

- 1. To locate the EVAP leak, install EVAP service port adapter (commercial service tool) and pressure pump to EVAP service port.
- 2. Turn ignition switch ON.
- 3. Select the "EVAP SYSTEM CLOSE" of "WORK SUPPORT" mode with CONSULT-III.
- 4. Touch "START". A bar graph (Pressure indicating display) will appear on the screen.
- 5. Apply positive pressure to the EVAP system until the pressure indicator reaches the middle of the bar graph.
- 6. Remove EVAP service port adapter (commercial service tool) and hose with pressure pump.
- 7. Locate the leak using a leak detector (commercial service tool). Refer to <u>EC-84, "System Diagram"</u>.





- To locate the EVAP leak, install EVAP service port adapter (commercial service tool) and pressure pump to EVAP service port.
- 2. Apply battery voltage between the terminals of EVAP canister vent control valve to make a closed EVAP system.
- To locate the leak, deliver positive pressure to the EVAP system until pressure gauge points reach 1.38 to 2.76 kPa (0.014 to 0.028 kg/cm², 0.2 to 0.4 psi).
- 4. Remove EVAP service port adapter (commercial service tool) and hose with pressure pump.

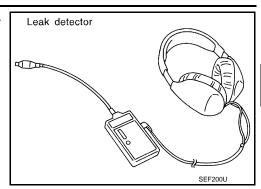


EVAP LEAK CHECK

< PERIODIC MAINTENANCE >

[VQ35HR]

5. Locate the leak using a leak detector (commercial service tool). Refer to EC-84, "System Diagram".



EC

Α

С

D

Е

G

F

Н

J

Κ

L

 \mathbb{N}

Ν

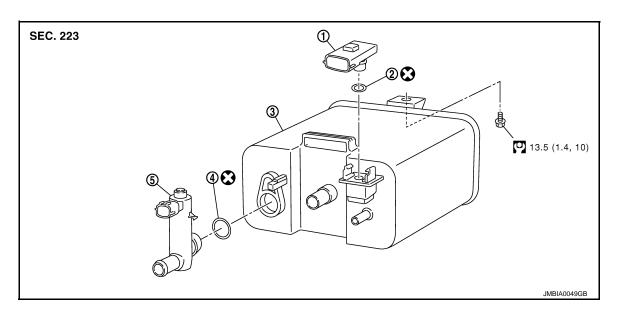
0

Ρ

REMOVAL AND INSTALLATION

EVAP CANISTER

Exploded View



- 1. EVAP canister system pressure sen- 2. O-ring
 - sor
- ŭ

EVAP canister

4. O-ring

5. EVAP canister vent control valve

Refer to GI-3, "Contents" for symbols not described on the above.

Removal and Installation

INFOID:0000000003856432

REMOVAL

- 1. Lift up the vehicle.
- Remove EVAP canister fixing bolt.
- 3. Remove EVAP canister.

NOTE:

The EVAP canister vent control valve and EVAP canister system pressure sensor can be removed without removing the EVAP canister.

INSTALLATION

Install in the reverse order of removal.

NOTE:

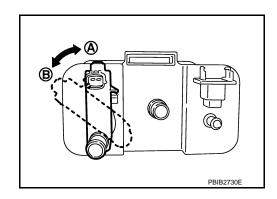
Tighten EVAP canister fixing bolt to the specified torque.

DISASSEMBLY

Turn EVAP canister vent control valve counterclockwise.

A : Lock
B : Unlock

2. Remove the EVAP canister vent control valve.



< REMOVAL AND INSTALLATION >

ASSEMBLY

Assemble in the reverse order of disassembly.

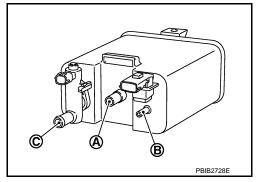
CAUTION:

Always replace O-ring with a new one.

Inspection INFOID:000000003856433

Check EVAP canister as follows:

- Block port (B).
- 2. Blow air into port (A) and check that it flows freely out of port (C).
- 3. Release blocked port (B).
- 4. Apply vacuum pressure to port (B) and check that vacuum pressure exists at the ports (A) and (C).
- 5. Block port (A) and (B).
- 6. Apply pressure to port (C) and check that there is no leakage.



EC

Α

D

Е

F

G

Н

J

Κ

L

M

Ν

0

Р

Revision: 2009 March EC-571 2009 FX35/FX50

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[VQ35HR]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Idle Speed

Condition	Specification
No load* (in P or N position)	675 ± 50 rpm

^{*:} Under the following conditions

- · A/C switch: OFF
- Electric load: OFF (Lights, heater fan & rear window defogger)
- Steering wheel: Kept in straight-ahead position

Ignition Timing

INFOID:0000000003856435

Condition	Specification
No load* (in P or N position)	15 ± 5° BTDC

^{*:} Under the following conditions

- · A/C switch: OFF
- Electric load: OFF (Lights, heater fan & rear window defogger)
- Steering wheel: Kept in straight-ahead position

Calculated Load Value

INFOID:0000000003856436

Condition	Specification (Using CONSULT-III or GST)
At idle	5 – 35%
At 2,500 rpm	5 – 35%

Mass Air Flow Sensor

INFOID:0000000003856437

Supply voltage	Battery voltage (11 – 14 V)
Output voltage at idle	0.8 – 1.1 V*
Mass air flow (Using CONSULT-III or GST)	2.0 – 6.0 g·m/sec at idle* 7.0 – 20.0 g·m/sec at 2,500 rpm*

^{*:} Engine is warmed up to normal operating temperature and running under no load.

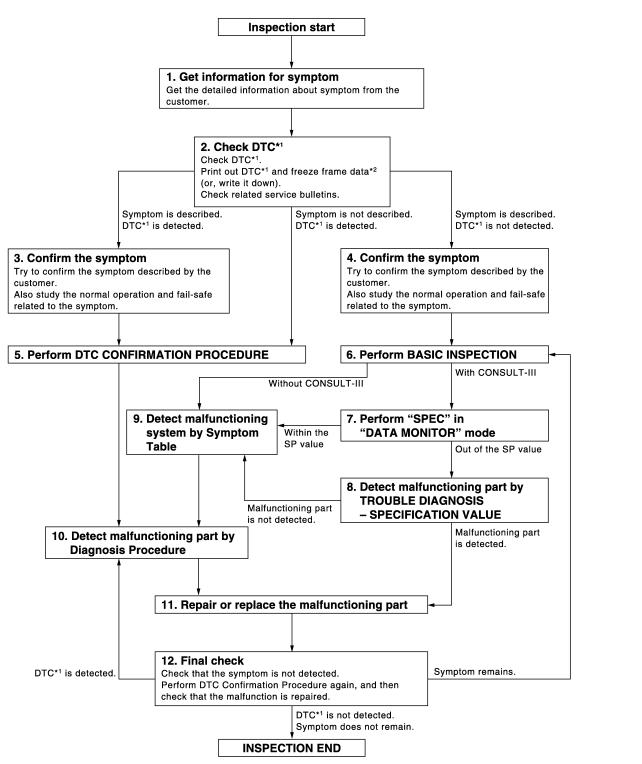
< BASIC INSPECTION > [VK50VE]

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

OVERALL SEQUENCE



^{*1:} Include 1st trip DTC.

JMBIA1416GB

Α

D

Е

Ν

Р

^{*2:} Include 1st trip freeze frame data.

< BASIC INSPECTION > [VK50VE]

1.GET INFORMATION FOR SYMPTOM

Get the detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred) using the "Diagnostic Work Sheet". (Refer to EC-576, "Diagnostic Work Sheet".)

>> GO TO 2.

2.CHECK DTC

- 1. Check DTC.
- 2. Perform the following procedure if DTC is displayed.
- Record DTC and freeze frame data. (Print them out with CONSULT-III or GST.)
- Erase DTC. (Refer to "How to Erase DTC and 1st Trip DTC" in EC-706. "Diagnosis Description".)
- Study the relationship between the cause detected by DTC and the symptom described by the customer. (Symptom Matrix Chart is useful. Refer to EC-1215, "Symptom Table".)
- 3. Check related service bulletins for information.

Are any symptoms described and any DTCs detected?

Symptom is described, DTC is detected>>GO TO 3.

Symptom is described, DTC is not detected>>GO TO 4.

Symptom is not described, DTC is detected>>GO TO 5.

3.CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer (except MIL ON).

Also study the normal operation and fail-safe related to the symptom. Refer to <u>EC-1220, "Description"</u> and <u>EC-1168, "Fail-safe"</u>.

Diagnosis Work Sheet is useful to verify the incident.

Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 5.

4. CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer.

Also study the normal operation and fail-safe related to the symptom. Refer to <u>EC-1220, "Description"</u> and <u>EC-1168, "Fail-safe"</u>.

Diagnosis Work Sheet is useful to verify the incident.

Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 6.

5. PERFORM DTC CONFIRMATION PROCEDURE

Perform DTC CONFIRMATION PROCEDURE for the displayed DTC, and then check that DTC is detected again.

If two or more DTCs are detected, refer to <u>EC-1171, "DTC Inspection Priority Chart"</u> and determine trouble diagnosis order.

NOTE:

- Freeze frame data is useful if the DTC is not detected.
- Perform Component Function Check if DTC CONFIRMATION PROCEDURE is not included on Service Manual. This simplified check procedure is an effective alternative though DTC cannot be detected during this check.

If the result of Component Function Check is NG, it is the same as the detection of DTC by DTC CONFIR-MATION PROCEDURE.

Is DTC detected?

YES >> GO TO 10.

NO >> Check according to GI-35, "Intermittent Incident".

PERFORM BASIC INSPECTION

Perform EC-577, "BASIC INSPECTION: Special Repair Requirement".

Will CONSULT-III be used?

DIAGNOSIS AND REPAIR WORKFLOW

[VK50VE] < BASIC INSPECTION > YES >> GO TO 7. NO >> GO TO 9. Α 7.PERFORM SPEC IN DATA MONITOR MODE With CONSULT-III EC Check that "MAS A/F SE-B1", "MAS A/F SE-B2", "B/FUEL SCHDL", "A/F ALPHA-B1" and "A/F ALPHA-B2" are within the SP value using "SPEC" in "DATA MONITOR" mode with CONSULT-III. Refer to EC-731, "Component Function Check". Is the measurement value within the SP value? YES >> GO TO 9. NO >> GO TO 8. D $oldsymbol{\mathsf{S}}.\mathsf{DETECT}$ MALFUNCTIONING PART BY TROUBLE DIAGNOSIS - SPECIFICATION VALUE Detect malfunctioning part according to <u>EC-732</u>, "Diagnosis Procedure". Is a malfunctioning part detected? Е YES >> GO TO 11. NO >> GO TO 9. $\mathbf{9}.$ DETECT MALFUNCTIONING SYSTEM BY SYMPTOM TABLE F Detect malfunctioning system according to EC-1215, "Symptom Table" based on the confirmed symptom in step 4, and determine the trouble diagnosis order based on possible causes and symptoms. >> GO TO 10. 10.DETECT MALFUNCTIONING PART BY DIAGNOSIS PROCEDURE Н Inspect according to Diagnosis Procedure of the system. The Diagnosis Procedure in EC section described based on open circuit inspection. A short circuit inspection is also required for the circuit check in the Diagnosis Procedure. For details, refer to GI-38, "Circuit Inspection". Is a malfunctioning part detected? YES >> GO TO 11. NO >> Monitor input data from related sensors or check voltage of related ECM terminals using CON-SULT-III. Refer to EC-1127, "Reference Value". K 11. REPAIR OR REPLACE THE MALFUNCTIONING PART Repair or replace the malfunctioning part. 2. Reconnect parts or connectors disconnected during Diagnosis Procedure again after repair and replace-Check DTC. If DTC is displayed, erase it. Refer to "How to Erase DTC and 1st Trip DTC" in EC-706. "Diagnosis Description". M >> GO TO 12. 12. FINAL CHECK Ν When DTC was detected in step 2, perform DTC CONFIRMATION PROCEDURE or Component Function Check again, and then check that the malfunction have been completely repaired. When symptom was described from the customer, refer to confirmed symptom in step 3 or 4, and check that the symptom is not detected. Is DTC detected and does symptom remain? Р YES-1 >> DTC is detected: GO TO 10. YES-2 >> Symptom remains: GO TO 6. NO >> Before returning the vehicle to the customer, always erase unnecessary DTC in ECM and TCM (Transmission Control Module). (Refer to "How to Erase DTC and 1st Trip DTC" in EC-706, "Diagnosis Description".) If the completion of SRT is needed, drive vehicle under the specific driving

pattern. Refer to EC-1177, "How to Set SRT Code".

Diagnostic Work Sheet

INFOID:0000000003958614

DESCRIPTION

There are many operating conditions that lead to the malfunction of engine components. A good grasp of such conditions can make troubleshooting faster and more accurate.

In general, each customer feels differently about symptoms. It is important to fully understand the symptoms or conditions for a customer complaint.

Utilize a diagnostic worksheet like the WORKSHEET SAMPLE below in order to organize all the information for troubleshooting. Some conditions may cause the MIL to illuminate or blink, and DTC to be detected. Examples:

- Vehicle ran out of fuel, which caused the engine to misfire.
- Fuel filler cap was left off or incorrectly screwed on, allowing fuel to evaporate into the atmosphere.

KEY POINTS

WHAT Vehicle & engine model
WHEN Date, Frequencies
WHERE..... Road conditions
HOW Operating conditions,
Weather conditions,
Symptoms

SEF907L

WORKSHEET SAMPLE

Customer nar	me MR/MS	Model & Year	VIN									
Engine #		Trans.	Mileage									
Incident Date		Manuf. Date	In Service Date									
Fuel and fuel	filler cap	☐ Vehicle ran out of fuel causing misfire☐ Fuel filler cap was left off or incorrectly screwed on.										
	☐ Startability	☐ Impossible to start ☐ No combus ☐ Partial combustion affected by th ☐ Partial combustion NOT affected ☐ Possible but hard to start ☐ Other	nrottle position I by throttle position									
Symptoms	□ Idling	☐ No fast idle ☐ Unstable ☐ H☐ Others [
	☐ Driveability	☐ Stumble ☐ Surge ☐ Knock☐ Intake backfire ☐ Exhaust backfi☐ Others [Intake backfire Exhaust backfire									
	☐ Engine stall	☐ At the time of start ☐ While idling ☐ While accelerating ☐ While dece ☐ Just after stopping ☐ While loadi	ellerating									
Incident occurrence		☐ Just after delivery ☐ Recently ☐ In the morning ☐ At night [☐ In the daytime									
Frequency		☐ All the time ☐ Under certain conditions ☐ Sometimes										
Weather cond	ditions	☐ Not affected										
	Weather	☐ Fine ☐ Raining ☐ Snowing	Others [
	Temperature	☐ Hot ☐ Warm ☐ Cool ☐	Cold Humid °F									
		☐ Cold ☐ During warm-up ☐	After warm-up									
Engine condit	ions	Engine speed0 2,000	4,000 6,000 8,000 rpm									
Road condition	ons	☐ In town ☐ In suburbs ☐ Hig	hway									
Driving conditions		Not affected At starting										
		0 10 20	30 40 50 60 MPH									
Malfunction in	ndicator lamp	☐ Turned on ☐ Not turned on										

MTBL0017

< BASIC INSPECTION > [VK50VE]

INSPECTION AND ADJUSTMENT BASIC INSPECTION

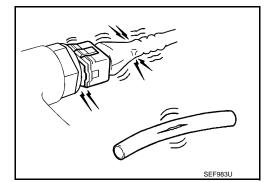
BASIC INSPECTION: Special Repair Requirement

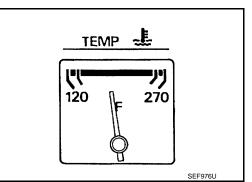
INFOID:0000000003958615

EC

1.INSPECTION START

- 1. Check service records for any recent repairs that may indicate a related malfunction, or a current need for scheduled maintenance.
- 2. Open engine hood and check the following:
- Harness connectors for improper connections
- Wiring harness for improper connections, pinches and cut
- Vacuum hoses for splits, kinks and improper connections
- Hoses and ducts for leakage
- Air cleaner clogging
- Gasket
- 3. Check that electrical or mechanical loads are not applied.
- Headlamp switch is OFF.
- Air conditioner switch is OFF.
- Rear window defogger switch is OFF.
- Steering wheel is in the straight-ahead position, etc.
- Start engine and warm it up until engine coolant temperature indicator points to the middle of gauge. Check that engine stays below 1,000 rpm.

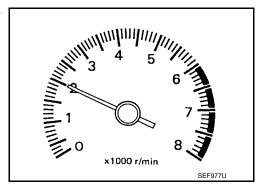




- 5. Run engine at approximately 2,000 rpm for approximately 2 minutes under no load.
- 6. Check that no DTC is displayed with CONSULT-III or GST.

Are any DTCs detected?

YES >> GO TO 2. NO >> GO TO 3.



2. REPAIR OR REPLACE

Repair or replace components as necessary according to corresponding Diagnosis Procedure.

>> GO TO 3

3.CHECK IDLE SPEED

1. Run engine at approximately 2,000 rpm for approximately 2 minutes under no load.

Α

D

Е

F

G

Н

Κ

.

M

IVI

Ν

0

Р

Revision: 2009 March EC-577 2009 FX35/FX50

< BASIC INSPECTION > [VK50VE]

2. Rev engine between 2,000 and 3,000 rpm 2 or 3 times under no load, then run engine at idle speed for approximately 1 minute.

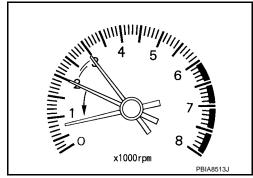
3. Check idle speed.

For procedure, refer to <u>EC-581</u>, "IDLE <u>SPEED</u>: <u>Special Repair</u> Requirement".

For specification, refer to EC-1233, "Idle Speed".

Is the inspection result normal?

YES >> GO TO 10. NO >> GO TO 4.



4.PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING

- Stop engine.
- 2. Perform <u>EC-582</u>, "ACCELERATOR PEDAL RELEASED POSITION LEARNING: Special Repair Requirement".

>> GO TO 5.

5. PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Perform EC-582, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement".

>> GO TO 6.

6. PERFORM IDLE AIR VOLUME LEARNING

Perform EC-583, "IDLE AIR VOLUME LEARNING: Special Repair Requirement".

Is Idle Air Volume Learning carried out successfully?

YES >> GO TO 7.

NO >> Follow the instruction of Idle Air Volume Learning. Then GO TO 4.

7.CHECK IDLE SPEED AGAIN

- Start engine and warm it up to normal operating temperature.
- 2. Check idle speed.

For procedure, refer to EC-581, "IDLE SPEED: Special Repair Requirement".

For specification, refer to EC-1233, "Idle Speed".

Is the inspection result normal?

YES >> GO TO 10.

NO >> GO TO 8.

8.DETECT MALFUNCTIONING PART

Check the Following.

- Check camshaft position sensor and circuit. Refer to EC-871, "DTC Logic".
- Check crankshaft position sensor and circuit. Refer to <u>EC-867</u>, "DTC Logic".

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair or replace malfunctioning part. Then GO TO 4.

9. CHECK ECM FUNCTION

- 1. Substitute with a non-malfunctioning ECM to check ECM function. (ECM may be the cause of the incident, although this is rare.)
- 2. Perform initialization of IVIS (NATS) system and registration of all IVIS (NATS) ignition key IDs. Refer to SEC-8, "ECM RE-COMMUNICATING FUNCTION: Special Repair Requirement".

>> GO TO 4.

10. CHECK IGNITION TIMING

- Run engine at idle.
- 2. Check ignition timing with a timing light.

Revision: 2009 March EC-578 2009 FX35/FX50

[VK50VE] < BASIC INSPECTION > For procedure, refer to EC-581, "IGNITION TIMING: Special Repair Requirement". For specification, refer to EC-1233, "Ignition Timing". Α Is the inspection result normal? YES >> GO TO 19. NO >> GO TO 11. EC 11. PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING Stop engine. Perform EC-582, "ACCELERATOR PEDAL RELEASED POSITION LEARNING: Special Repair Requirement". D >> GO TO 12. 12.perform throttle valve closed position learning Perform EC-582. "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement". >> GO TO 13. 13.PERFORM IDLE AIR VOLUME LEARNING Perform EC-583, "IDLE AIR VOLUME LEARNING: Special Repair Requirement". Is Idle Air Volume Learning carried out successfully? YES >> GO TO 14. >> Follow the instruction of Idle Air Volume Learning. Then GO TO 4. NO 14. CHECK IDLE SPEED AGAIN Н Start engine and warm it up to normal operating temperature. Check idle speed. For procedure, refer to EC-581, "IDLE SPEED: Special Repair Requirement". For specification, refer to EC-1233, "Idle Speed". Is the inspection result normal? YES >> GO TO 15. NO >> GO TO 17. 15. CHECK IGNITION TIMING AGAIN Run engine at idle. 2. Check ignition timing with a timing light. For procedure, refer to EC-581, "IGNITION TIMING: Special Repair Requirement". For specification, refer to EC-1233, "Ignition Timing". Is the inspection result normal? YES >> GO TO 19. M NO >> GO TO 16. 16.check timing chain installation Check timing chain installation. Refer to EM-213, "Disassembly and Assembly". Is the inspection result normal? YES >> GO TO 17. NO >> Repair the timing chain installation. Then GO TO 4. 17.DETECT MALFUNCTIONING PART Check the following. Check camshaft position sensor and circuit. Refer to <u>EC-871, "DTC Logic"</u>. Check crankshaft position sensor and circuit. Refer to EC-867, "DTC Logic". Is the inspection result normal? YES >> GO TO 18. >> Repair or replace malfunctioning part. Then GO TO 4. NO 18.check ecm function

< BASIC INSPECTION > [VK50VE]

 Substitute with a non-malfunctioning ECM to check ECM function. (ECM may be the cause of the incident, although this is rare.)

2. Perform initialization of IVIS (NATS) system and registration of all IVIS (NATS) ignition key IDs. Refer to .

>> GO TO 4.

19. INSPECTION END

If ECM is replaced during this BASIC INSPECTION procedure, perform <u>EC-580</u>, "ADDITIONAL SERVICE <u>WHEN REPLACING CONTROL UNIT (ECM)</u>: Special Repair Requirement".

>> INSPECTION END

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT (ECM)

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT (ECM): Description

INFOID:0000000003959710

When replacing ECM, the following procedure must be performed.

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT (ECM): Special Repair Requirement

 $1.\mathsf{perform}$ initialization of IVIS (NATS) SYSTEM AND REGISTRATION OF ALL IVIS (NATS) IGNITION KEY IDS

Refer to SEC-8, "ECM RE-COMMUNICATING FUNCTION: Special Repair Requirement".

>> GO TO 2.

2.PERFORM VIN REGISTRATION

Refer to EC-582, "VIN REGISTRATION: Special Repair Requirement".

>> GO TO 3.

3.PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING

Refer to EC-582, "ACCELERATOR PEDAL RELEASED POSITION LEARNING: Special Repair Requirement".

>> GO TO 4.

4. PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Refer to EC-582, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement".

>> GO TO 5.

5. PERFORM IDLE AIR VOLUME LEARNING

Refer to EC-583, "IDLE AIR VOLUME LEARNING: Special Repair Requirement".

>> END

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT (VVEL CONTROL MODULE)

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT (VVEL CONTROL MODULE): Description

When replacing VVEL control module, the following procedure must be performed.

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT (VVEL CONTROL

INSPECTION AND ADJUSTMENT [VK50VE] < BASIC INSPECTION > MODULE): Special Repair Requirement INFOID:0000000003959713 1.PERFORM IDLE AIR VOLUME LEARNING Refer to EC-583, "IDLE AIR VOLUME LEARNING: Special Repair Requirement". EC >> END **IDLE SPEED** IDLE SPEED : Description INFOID:0000000003958618 This describes how to check the idle speed. For the actual procedure, follow the instructions in "BASIC D INSPECTION". IDLE SPEED: Special Repair Requirement INFOID:0000000003958619

1. CHECK IDLE SPEED

With CONSULT-III

Check idle speed in "DATA MONITOR" mode with CONSULT-III.

With GST

Check idle speed with Service \$01 of GST.

>> INSPECTION END

IGNITION TIMING

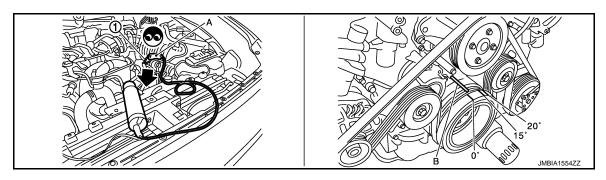
IGNITION TIMING: Description

This describes how to check the ignition timing. For the actual procedure, follow the instructions in "BASIC INSPECTION".

IGNITION TIMING: Special Repair Requirement

1. CHECK IGNITION TIMING

Attach timing light to loop wire as shown.



- Loop wire
- Timing light

- Timing indicator
- Check ignition timing.

>> INSPECTION END VIN REGISTRATION

VIN REGISTRATION: Description

VIN Registration is an operation to register VIN in ECM. It must be performed each time ECM is replaced. NOTE:

EC-581 Revision: 2009 March 2009 FX35/FX50

Α

Е

INFOID:0000000003958621

INFOID:0000000003958620

K

Ν

INFOID:0000000003958622

< BASIC INSPECTION > [VK50VE]

Accurate VIN which is registered in ECM may be required for Inspection & Maintenance (I/M).

VIN REGISTRATION : Special Repair Requirement

INFOID:0000000003958623

1.CHECK VIN

Check the VIN of the vehicle and note it. Refer to GI-16, "Information About Identification or Model Code".

>> GO TO 2.

2.PERFORM VIN REGISTRATION

- (II) With CONSULT-III
- 1. Turn ignition switch ON with engine stopped.
- 2. Select "VIN REGISTRATION" in "WORK SUPPORT" mode.
- Follow the instructions on the CONSULT-III display.

>> FND

ACCELERATOR PEDAL RELEASED POSITION LEARNING

ACCELERATOR PEDAL RELEASED POSITION LEARNING: Description INFOID-00000003958824

Accelerator Pedal Released Position Learning is a function of ECM to learn the fully released position of the accelerator pedal by monitoring the accelerator pedal position sensor output signal. It must be performed each time the harness connector of the accelerator pedal position sensor or ECM is disconnected.

ACCELERATOR PEDAL RELEASED POSITION LEARNING: Special Repair Requirement

1.START

- Check that accelerator pedal is fully released.
- 2. Turn ignition switch ON and wait at least 2 seconds.
- 3. Turn ignition switch OFF and wait at least 10 seconds.
- 4. Turn ignition switch ON and wait at least 2 seconds.
- 5. Turn ignition switch OFF and wait at least 10 seconds.

>> END

THROTTLE VALVE CLOSED POSITION LEARNING

THROTTLE VALVE CLOSED POSITION LEARNING: Description

Throttle Valve Closed Position Learning is a function of ECM to learn the fully closed position of the throttle valve by monitoring the throttle position sensor output signal. It must be performed each time the harness connector of the electric throttle control actuator or ECM is disconnected.

THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement

INFOID:0000000003958627

INFOID:0000000003958626

1.START

- 1. Check that accelerator pedal is fully released.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.Check that throttle valve moves during the above 10 seconds by confirming the operating sound.

>> END
IDLE AIR VOLUME LEARNING

INSPECTION AND ADJUSTMENT [VK50VE] < BASIC INSPECTION > IDLE AIR VOLUME LEARNING: Description INFOID:0000000003958628 Α Idle Air Volume Learning is a function of ECM to learn the idle air volume that keeps engine idle speed within the specific range. It must be performed under the following conditions: Each time the electric throttle control actuator or ECM is replaced. EC Idle speed or ignition timing is out of the specification. IDLE AIR VOLUME LEARNING: Special Repair Requirement INFOID:0000000003958629 1.PRECONDITIONING Check that all of the following conditions are satisfied. Learning will be cancelled if any of the following conditions are missed for even a moment. D Battery voltage: More than 12.9 V (At idle) • Engine coolant temperature: 70 - 105°C (158 - 221°F) Selector lever position: P or N Е Electric load switch: OFF (Air conditioner, headlamp, rear window defogger) On vehicles equipped with daytime light systems, if the parking brake is applied before the engine is F started the headlamp will not illuminate. Steering wheel: Neutral (Straight-ahead position) Vehicle speed: Stopped Transmission: Warmed-up - With CONSULT-III: Drive vehicle until "ATF TEMP 2" in "DATA MONITOR" mode of "A/T" system indicates less than 0.9 V. - Without CONSULT-III: Drive vehicle for 10 minutes. Н Will CONSULT-III be used? YES >> GO TO 2. NO >> GO TO 3. 2.PERFORM IDLE AIR VOLUME LEARNING (P) With CONSULT-III Perform Accelerator Pedal Released Position Learning, Refer to EC-582, "ACCELERATOR PEDAL RELEASED POSITION LEARNING: Special Repair Requirement". Perform Throttle Valve Closed Position Learning. EC-582, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement". Start engine and warm it up to normal operating temperature. Select "IDLE AIR VOL LEARN" in "WORK SUPPORT" mode. Touch "START" and wait 20 seconds. Is "CMPLT" displayed on CONSULT-III screen? YES >> GO TO 4. NO >> GO TO 5. 3.PERFORM IDLE AIR VOLUME LEARNING Without CONSULT-III NOTE: N It is better to count the time accurately with a clock. It is impossible to switch the diagnostic mode when an accelerator pedal position sensor circuit has a malfunction. Perform Accelerator Pedal Released Position Learning. Refer to EC-582, "ACCELERATOR PEDAL RELEASED POSITION LEARNING: Special Repair Requirement".

2. Perform Throttle Valve Closed Position Learning. <u>EC-582</u>, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement".

Р

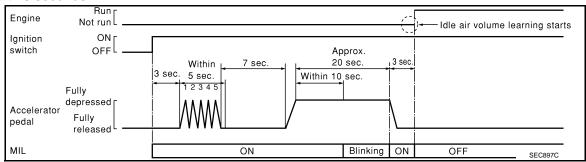
- 3. Start engine and warm it up to normal operating temperature.
- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Confirm that accelerator pedal is fully released, turn ignition switch ON and wait 3 seconds.
- 6. Repeat the following procedure quickly 5 times within 5 seconds.
- Fully depress the accelerator pedal.
- Fully release the accelerator pedal.

Revision: 2009 March EC-583 2009 FX35/FX50

< BASIC INSPECTION > [VK50VE]

Wait 7 seconds, fully depress the accelerator pedal for approx. 20 seconds until the MIL stops blinking and turns ON.

- 8. Fully release the accelerator pedal within 3 seconds after the MIL turns ON.
- 9. Start engine and let it idle.
- 10. Wait 20 seconds.



>> GO TO 4.

4. CHECK IDLE SPEED AND IGNITION TIMING

Rev up engine two or three times and check that idle speed and ignition timing are within the specifications. For procedure, refer to <u>EC-1233</u>, "Idle <u>Speed"</u> and <u>EC-1233</u>, "Ignition <u>Timing"</u>.

For specifications, refer to EC-1233, "Idle Speed" and EC-1233, "Ignition Timing".

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 5.

DETECT MALFUNCTIONING PART-I

Check the following

- Check that throttle valve is fully closed.
- Check PCV valve operation.
- Check that downstream of throttle valve is free from air leakage.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace malfunctioning part.

6.DETECT MALFUNCTIONING PART-II

Engine component parts and their installation condition are questionable. Check and eliminate the cause of the incident.

It is useful to perform "TROUBLE DIAGNOSIS - SPECIFICATION VALUE". Refer to <u>EC-731</u>, "<u>Description</u>". If any of the following conditions occur after the engine has started, eliminate the cause of the incident and perform Idle Air Volume Learning again:

- Engine stalls.
- · Incorrect idle.

>> INSPECTION END

VVEL CONTROL SHAFT POSITION SENSOR ADJUSTMENT

VVEL CONTROL SHAFT POSITION SENSOR ADJUSTMENT : Description

INFOID:0000000003959714

VVEL control shaft position sensor adjustment is an operation to adjust the initial position of the VVEL control shaft position sensor.

It must be performed each time VVEL actuator sub assembly is replaced.

CAUTION:

- It must be performed only on the replaced bank side.
- It must not be performed except when VVEL actuator sub assembly is replaced. If by any chance the adjustment is performed, replace VVEL actuator sub assembly.

VVEL CONTROL SHAFT POSITION SENSOR ADJUSTMENT: Special Repair Re-

< BASIC INSPECTION > [VK50VE]

quirement

1.START

Will CONSULT-III be used?

Will CONSULT-III be used?

YES >> GO TO 2.

NO >> GO TO 3.

2. PERFORM VVEL CONTROL SHAFT POSITION SENSOR ADJUSTMENT

(II) With CONSULT-III

- Turn ignition switch ON.
- Select "VVEL POS SEN ADJ PREP" in "WORK SUPPORT" mode with CONSULT-III.
- 3. Touch "Start" and wait a few seconds.
- 4. Check that "CMPLT" is displayed on CONSULT-III screen.
- Select "VVEL POSITION SEN-B1" or "VVEL POSITION SEN-B2" in "DATA MONITOR" mode with CON-SULT-III.
- Loosen the VVEL control shaft position sensor mounting bolts (1).
- Turn the VVEL control shaft position sensor (2) clockwise and counterclockwise while monitoring the output voltage of "VVEL POSITION SEN-B1" or "VVEL POSITION SEN-B2" and adjust the output voltage to be within the standard value.

Voltage: 500 ± 48 mV

3. Tighten the VVEL control shaft position sensor mounting bolts.

7.0 N•m (0.71 kg-m, 62 in-lb)

Reconfirm that the output voltage of "VVEL POSITION SEN-B1" or "VVEL POSITION SEN-B2" is within the standard value.

Voltage: $500 \pm 48 \text{ mV}$

NOTE:

If it varies from the standard value after the mounting bolts are tightened, perform steps 6 to 8 again.

- 10. Turn ignition switch OFF and wait at least 10 seconds.
- 11. Start engine and warm it up to normal operating temperature.
- 12. Turn ignition switch OFF and wait at least 10 seconds.
- 13. Perform idle air volume learning. Refer to <u>EC-583</u>, "IDLE AIR VOLUME LEARNING: Special Repair Requirement".

>> INSPECTION END

3.PERFORM VVEL CONTROL SHAFT POSITION SENSOR ADJUSTMENT

Without CONSULT-Ⅲ

- 1. Disconnect VVEL control shaft position sensor harness connector.
- Remove VVEL actuator motor relay.
- 3. Turn ignition switch ON, wait at least 5 seconds and then turn it OFF.
- 4. Reconnect all harness connectors disconnected.
- 5. Install VVEL actuator motor relay.
- Turn ignition switch ON and wait at least 5 seconds.

EC

Α

D

Г

G

Н

IMBIA155777

K

L

M

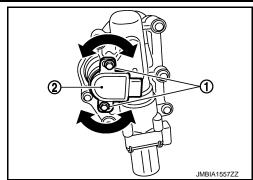
NI

0

1

< BASIC INSPECTION > [VK50VE]

- 7. Loosen the VVEL control shaft position sensor mounting bolts (1).
- 8. Turn the VVEL control shaft position sensor (2) clockwise and counterclockwise while monitoring the output voltage between the VVEL control module terminals with a tester and adjust the output voltage to be within the standard value.



		VVEL control module		
Bank	Connector	+	_	Voltage
Dalik	Connector	Terminal	Terminal	
1	E16	3	6	500 ± 48 mV
2	E 10	5	4	300 ± 46 IIIV

Tighten the VVEL control shaft position sensor mounting bolts.

7.0 N•m (0.71 kg-m, 62 in-lb)

10. Reconfirm that the output voltage of VVEL control shaft position sensor is within the standard value.

		VVEL control module		
Bank	Connector	+	_	Voltage
Dalik	Connector	Terminal	Terminal	
1	E16	3	6	500 ± 48 mV
2		5	4	500 ± 40 IIIV

NOTE:

If it varies from the standard value after the mounting bolts are tightened, perform steps 7 to 9 again.

- 11. Turn ignition switch OFF and wait at least 10 seconds.
- 12. Start engine and warm it up to normal operating temperature.
- 13. Turn ignition switch OFF and wait at least 10 seconds.
- 14. Perform Idle Air Volume Learning. Refer to <u>EC-583</u>, "IDLE AIR VOLUME LEARNING : Special Repair Requirement".

>> INSPECTION END

MIXTURE RATIO SELF-LEARNING VALUE CLEAR

MIXTURE RATIO SELF-LEARNING VALUE CLEAR: Description

This describes how to erase the mixture ratio self-learning value. For the actual procedure, follow the instructions in "Diagnosis Procedure".

MIXTURE RATIO SELF-LEARNING VALUE CLEAR: Special Repair Requirement

INFOID:0000000003958633

INFOID:0000000003958632

1.START

- (P) With CONSULT-III
- 1. Start engine and warm it up to normal operating temperature.
- Select "SELF-LEARNING CONT" in "WORK SUPPORT" mode with CONSULT-III.
- 3. Clear mixture ratio self-learning value by touching "CLEAR".
- ® With GST
- 1. Start engine and warm it up to normal operating temperature.

[VK50VE] < BASIC INSPECTION >

- Turn ignition switch OFF.
- Disconnect mass air flow sensor (bank 1) harness connector.
- 4. Restart engine and let it idle for at least 5 seconds.
- Stop engine and reconnect mass air flow sensor (bank 1) harness connector. Select Service \$03 with GST. Check DTC P0102 is detected.
- Select Service \$04 with GST to erase the DTC P0102.

>> END

EC

Α

C

D

Е

F

G

Н

J

K

L

M

Ν

0

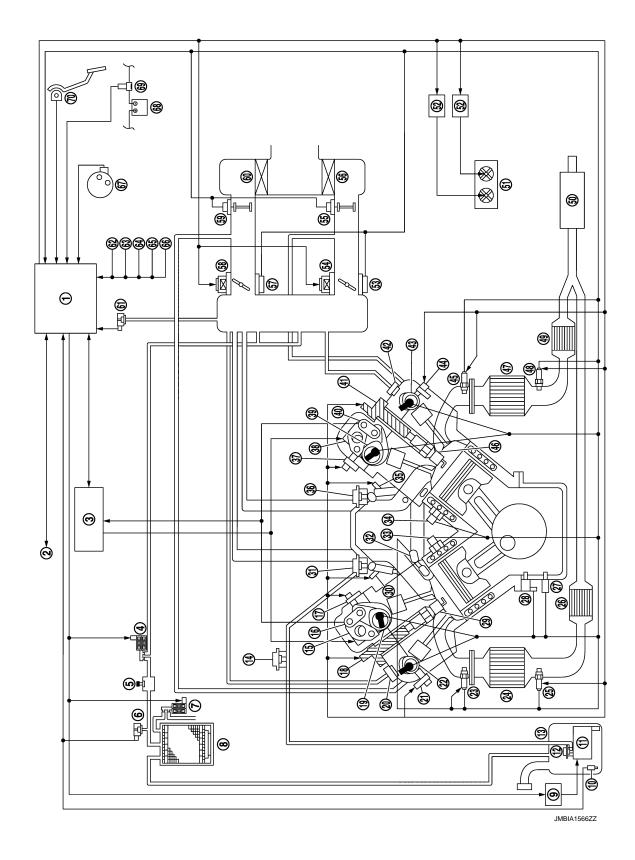
Р

EC-587 Revision: 2009 March 2009 FX35/FX50

SYSTEM DESCRIPTION

ENGINE CONTROL SYSTEM

System Diagram



ENGINE CONTROL SYSTEM

[VK50VE] < SYSTEM DESCRIPTION >

1.	ECM	2.	CAN communication	3.	VVEL control module	Α
4.	EVAP canister purge volume control solenoid valve	5.	EVAP service port	6.	EVAP control system pressure sensor	
7.	EVAP canister vent control valve	8.	EVAP canister	9.	Fuel pump control module (FPCM)	EC
10.	Fuel tank temperature sensor	11.	Fuel level sensor unit and fuel pump	12.	Fuel pressure regulator	
13.	Fuel tank	14.	Fuel damper	15.	VVEL actuator motor	
16.	VVEL control shaft position sensor	17.	Intake valve timing control solenoid valve	18.	Ignition coil (with power transistor)	С
19.	Camshaft position sensor	20.	PCV valve	21.	Exhaust valve timing control sole- noid valve	
22.	Exhaust valve timing control position sensor	23.	Air fuel ratio (A/F) sensor 1	24.	Three way catalyst (manifold)	D
25.	Heated oxygen sensor 2	26.	Three way catalyst (under floor)	27.	Engine oil temperature sensor	
28.	Crankshaft position sensor	29.	Spark plug	30.	Fuel injector	Е
31.	Fuel damper	32.	Engine coolant temperature sensor	33.	Knock sensor	
34.	Knock sensor	35.	Fuel injector	36.	Fuel damper	
37.	Intake valve timing control solenoid valve	38.	VVEL actuator motor	39.	Camshaft position sensor	F
40.	VVEL control shaft position sensor	41.	Ignition coil (with power transistor)	42.	PCV valve	
43.	Exhaust valve timing control position sensor	44.	Exhaust valve timing control sole- noid valve	45.	Air fuel ratio (A/F) sensor 1	G
46.	Spark plug	47.	Three way catalyst (manifold)	48.	Heated oxygen sensor 2	
49.	Three way catalyst (under floor)	50.	Muffler	51.	Cooling fan motor	Н
52.	Cooling fan control module	53.	Throttle position sensor	54.	Electric throttle control actuator	
55.	Mass air flow sensor (with intake air temperature sensor)	56.	Air cleaner	57.	Throttle position sensor	ı
58.	Electric throttle control actuator	59.	Mass air flow sensor	60.	Air cleaner	
61.	Manifold pressure sensor (This sensor is not for controlling the engine system, nor for the on board diagnosis.)	62.	Park/neutral position (PNP) signal	63.	Power steering pressure sensor	J
64.	Refrigerant pressure sensor	65.	Snow mode switch	66.	Stop lamp switch	
67.	Ignition switch	68.	Battery	69.	Battery current sensor	K
70.	Accelerator pedal position sensor					
Syste	em Description				INFOID:000000003958635	L
-014					en a natural	

S

ECM performs various controls such as fuel injection control and ignition timing control.

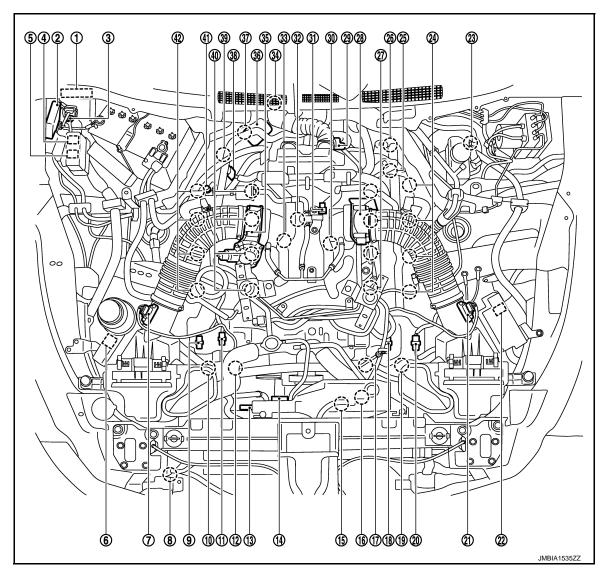
M

Ν

EC-589 Revision: 2009 March 2009 FX35/FX50

Component Parts Location

INFOID:0000000003958636



- IPDM E/R
- VVEL actuator motor relay
- Mass air flow sensor (bank 2)
- 10. Exhaust valve timing control solenoid valve (bank 2)
- 13. Cooling fan motor-1
- Cooling fan control module-2
- 19. Exhaust valve timing control solenoid valve (bank 1)
- 22. ICC brake hold relay (ICC models)
- 25. VVEL actuator motor (bank 1)
- 28. Electric throttle control actuator (bank 1)

- 2. VVEL control module
- 5. Cooling fan relay-1
- Refrigerant pressure sensor
- 11. Camshaft position sensor (bank 2)
- 14. Cooling fan control module-1
- 17. Intake valve timing control solenoid valve (bank 1)
- 20. Exhaust valve timing control position 21. Mass air flow sensor (with intake air sensor (bank 1)
- 23. Brake booster pressure sensor
- 26. VVEL control shaft position sensor (bank 1)
- 29. A/F sensor 1 (bank 1)

- Battery current sensor
- 6. Cooling fan relay-2
- Exhaust valve timing control position sensor (bank 2)
- 12. Intake valve timing control solenoid valve (bank 2)
- 15. Cooling fan motor-2
- Camshaft position sensor (bank 1)
- temperature sensor) (bank 1)
- 24. Ignition coil (with power transistor) and spark plug (bank 1)
- 27. Fuel injector (bank 1)
- 30. Knock sensor (bank 1)

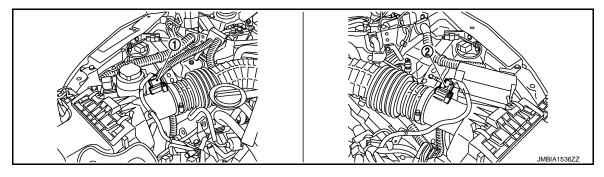
ENGINE CONTROL SYSTEM

[VK50VE] < SYSTEM DESCRIPTION >

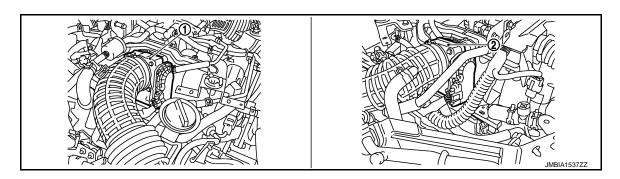
- 31. EVAP canister purge volume control solenoid valve
- 32. Manifold pressure sensor (This sensor is not for controlling the engine system, nor for the on board diagnosis.)
- 33. Knock sensor (bank 2)

- 34. Crankshaft position sensor
- 35. Electric throttle control actuator (bank2)
- 36. VVEL actuator motor (bank 2)
- 37. VVEL control shaft position sensor 38. A/F sensor 1 (bank 2) (bank 2)
- 39. Engine coolant temperature sensor

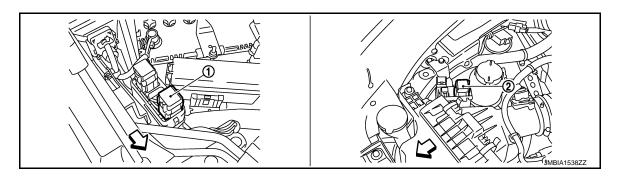
- 40. Fuel injector (bank 2)
- 41. EVAP service port
- 42. Ignition coil (with power transistor) and spark plug (bank 2)



- Mass air flow sensor (bank 2)
- 2. Mass air flow sensor (with intake air temperature sensor) (bank 1)



- Electric throttle control actuator (bank 2)
- 2. Electric throttle control actuator (bank 1)



- Cooling fan relay-1
- 2. Cooling fan relay-2

Vehicle front

EC-591 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

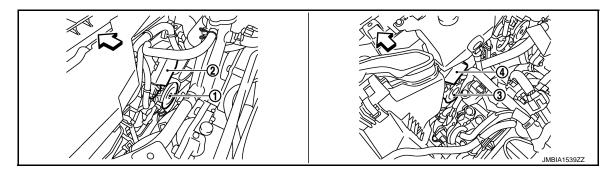
Е

Н

M

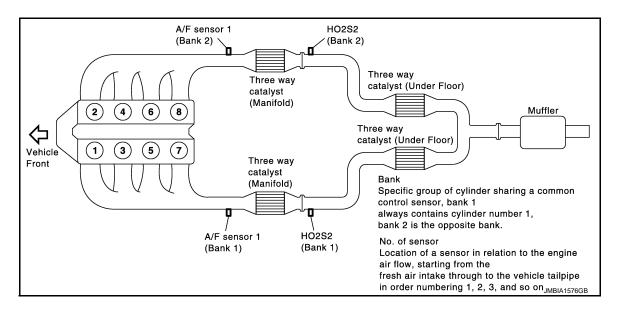
Ν

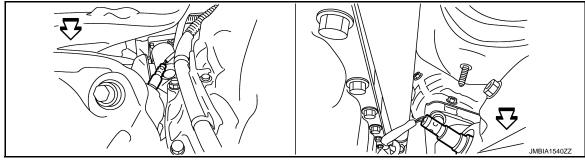
Ρ



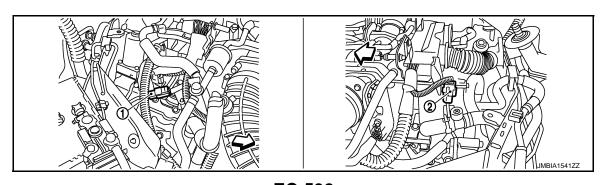
- 1. Cooling fan motor-1
- 2. Cooling fan control module-1
- 3. Cooling fan motor-2

- 4. Cooling fan control module-2
- Vehicle front





- 1. A/F sensor 1 (bank 1)
- 2. A/F sensor 1 (bank 2)



Α

EC

D

Е

F

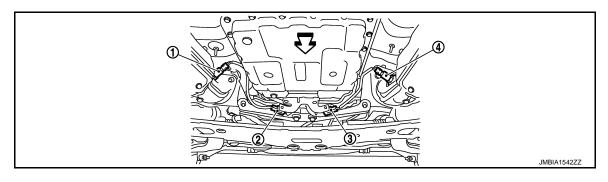
Н

Ν

Р

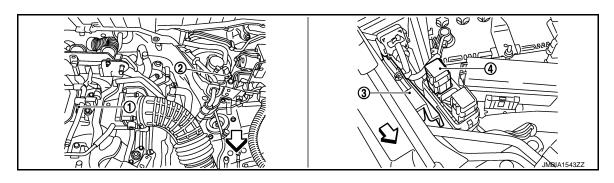
- A/F sensor 1 (bank 2) harness con- 2. nector
- 2. A/F sensor 1 (bank 1) harness connector

⟨ Vehicle front



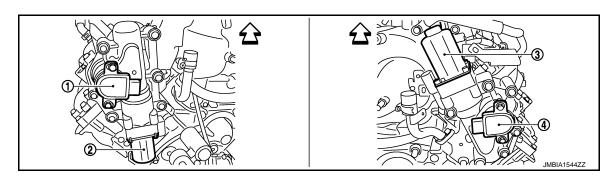
- 1. Heated oxygen sensor 2 (bank 1)
- 2. Heated oxygen sensor 2 (bank 1) harness connector
- Heated oxygen sensor 2 (bank 2) harness connector

- 4. Heated oxygen sensor 2 (bank 2)
- Vehicle front



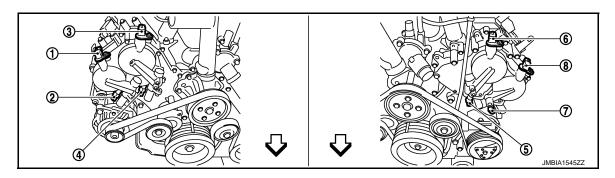
- Manifold pressure sensor (This sensor is not for controlling the engine system, nor for the on board diagnosis.)
- 2. Brake booster pressure sensor
- VVEL control module

- 4. VVEL actuator motor relay
- ∀ Vehicle front



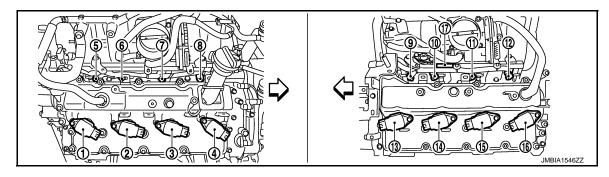
- VVEL control shaft position sensor (bank 1)
- 2. VVEL actuator motor (bank 1)
- 3. VVEL actuator motor (bank 2)

- VVEL control shaft position sensor (bank 2)
- Vehicle front



- Exhaust valve timing control position 2. sensor (bank 2)
- Intake valve timing control solenoid valve (bank 2)
- Exhaust valve timing control solenoid 8. valve (bank 1)
- ∀ Vehicle front

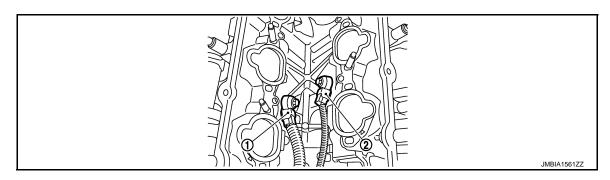
- Exhaust valve timing control solenoid 3. valve (bank 2)
- Intake valve timing control solenoid valve (bank 1)
- Exhaust valve timing control position sensor (bank 1)
- Camshaft position sensor (bank 2)
- Camshaft position sensor (bank 1)



- Ignition coil No.8 (with power transis- 2.
- Ignition coil No.2 (with power transis- 5. 4. tor)
- 7. Fuel injector No.4
- 10. Fuel injector No.3
- 13. Ignition coil No.1 (with power transis- 14. Ignition coil No.3 (with power transis- 15.
- 16. Ignition coil No.7 (with power transis- 17. Condenser tor)
- Vehicle front

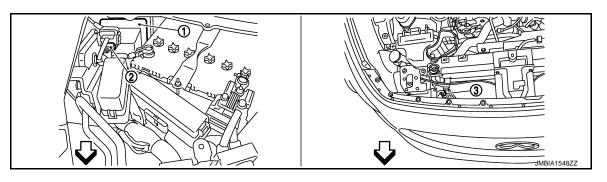
- Ignition coil No.6 (with power transis- 3. tor)
- Fuel injector No.8
- Fuel injector No.2
- 11. Fuel injector No.5

- Ignition coil No.4 (with power transistor)
- Fuel injector No.6
- Fuel injector No.1
- 12. Fuel injector No.7
- Ignition coil No.5 (with power transistor)



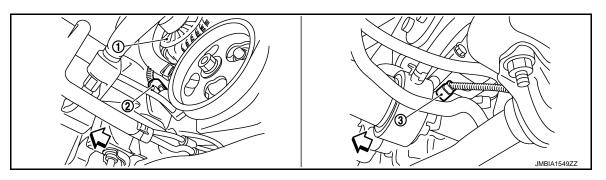
- Knock sensor (bank 2)
- Knock sensor (bank 1)

- Engine coolant temperature sensor 2. Crankshaft position sensor
- ∀ Vehicle front



- 1. IPDM E/R
 - Battery current sensor
- Refrigerant pressure sensor

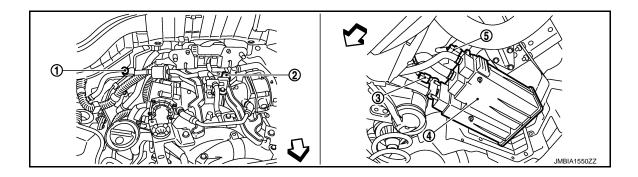
∀ Vehicle front



Alternator

- Power steering pressure sensor
- 3. Engine oil temperature sensor

∀ Vehicle front



EC-595 Revision: 2009 March 2009 FX35/FX50

EC

Α

 D

Е

F

G

Н

M

Ν

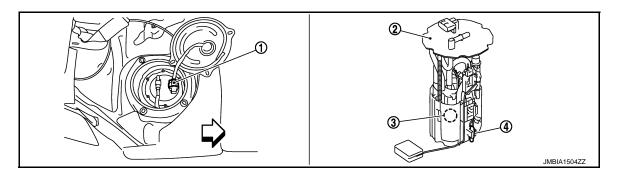
0

Р

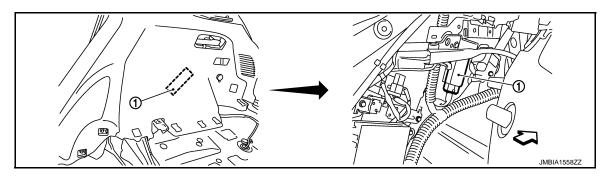
- 1. EVAP service port
- EVAP canister purge volume control 3. EVAP canister vent control valve solenoid valve

4. EVAP canister

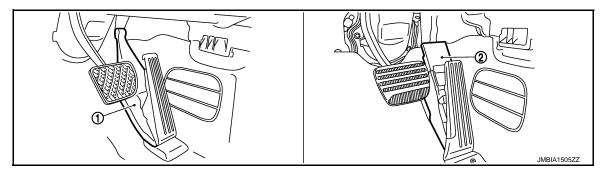
EVAP control system pressure sensor



- Fuel level sensor unit and fuel pump 2. Fuel level sensor unit and fuel pump 3. Fuel pressure regulator harness connector
- 4. Fuel tank temperature sensor
- ∀ Vehicle front



- 1. FPCM



- Accelerator pedal position sensor (without DCA system)
- 2. Accelerator pedal position sensor (with DCA system)

Α

EC

D

Е

F

G

Н

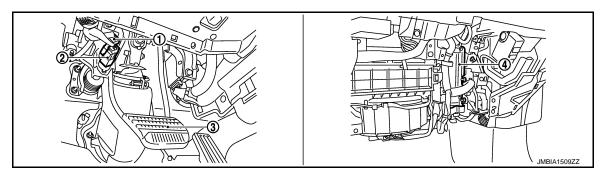
K

M

Ν

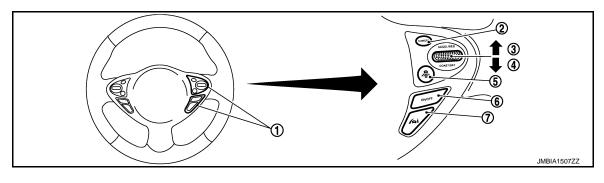
0

Р



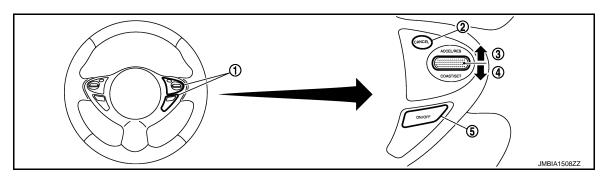
- 1. Stop lamp switch
- 2. ASCD brake switch (ASCD models) 3. ICC brake switch (ICC models)
 - Brake pedal

4. ECM



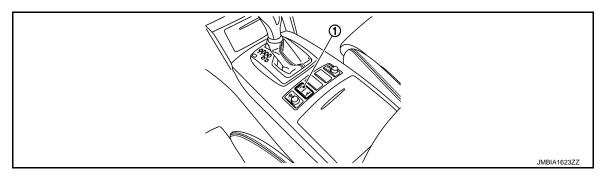
- 1. ICC steering switch
- 4. SET/COAST switch
- 7. LDP switch

- 2. CANCEL switch
- 5. DISTANCE switch
- 3. RESUME/ACCELERATE switch
- 6. MAIN switch



- 1. ASCD steering switch
- 4. SET/COAST switch
- CANCEL switch
- 5. MAIN switch

3. RESUME/ACCELERATE switch



1. Snow mode switch

[VK50VE]

Component Description

INFOID:0000000003958637

Component	Reference
A/F sensor 1	EC-799. "Description"
A/F sensor 1 heater	EC-756, "Description"
Accelerator pedal position sensor	EC-1067, "Description"
ASCD brake switch	EC-1041, "Description"
ASCD steering switch	EC-1034, "Description"
Battery current sensor	EC-1016, "Description"
Brake booster pressure sensor	BRC-91, "Description"
Camshaft position sensor	EC-871, "Description"
Crankshaft position sensor	EC-867, "Description"
Cooling fan control module	EC-1089. "Description"
Cooling fan motor	EC-1089. "Description"
Electric throttle control actuator	EC-1007, "Description"
Engine coolant temperature sensor	EC-784, "Description"
Engine oil temperature sensor	EC-848, "Description"
EVAP canister purge volume control solenoid valve	EC-893. "Description"
EVAP canister vent control valve	EC-901, "Description"
EVAP control system pressure sensor	EC-909, "Description"
Exhaust valve timing control solenoid valve	EC-765. "Description"
Exhaust valve timing control position sensor	EC-969, "Description"
Fuel injector	EC-1096, "Description"
Fuel level sensor	EC-936, "Description"
Fuel pump	EC-1099, "Description"
Fuel pump control module (FPCM)	EC-993, "Description"
Fuel tank temperature sensor	EC-842, "Description"
Heated oxygen sensor 2	EC-814, "Description"
Heated oxygen sensor 2 heater	EC-759, "Description"
ICC brake switch	EC-1046, "Description"
ICC steering switch	EC-1037, "Description"
Ignition coil with power transistor	EC-1107, "Description"
Intake air temperature sensor	EC-781, "Description"
Intake valve timing control solenoid valve	EC-762, "Description"
Knock sensor	EC-864. "Description"
Mass air flow sensor	EC-768. "Description"
PCV valve	EC-1120, "Description"
Power steering pressure sensor	EC-951, "Description"
Refrigerant pressure sensor	EC-1122, "Description"
Snow mode switch	EC-1124, "Description"
Stop lamp switch	EC-1064, "Description"
Throttle control motor	EC-1004, "Description"
Throttle control motor relay	EC-1012, "Description"
Throttle position sensor	EC-789, "Description"
VVEL actuator motor	EC-979. "Description"

ENGINE CONTROL SYSTEM

< SYSTEM DESCRIPTION >

Component	Reference
VVEL actuator motor relay	EC-983, "Description"
VVEL control module	EC-1056, "Description"
VVEL control shaft position sensor	EC-975, "Description"

Α

EC

D

Е

F

G

Н

1

Κ

L

M

Ν

0

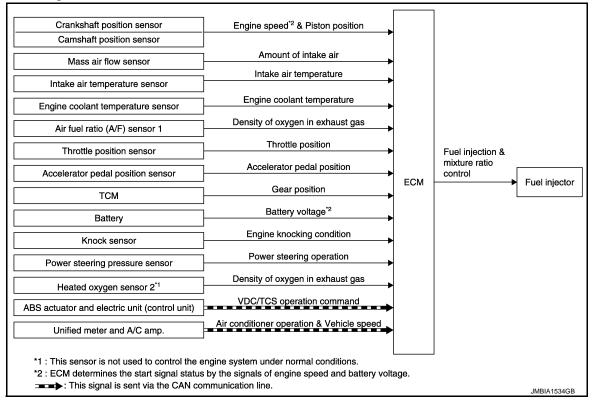
Ρ

[VK50VE]

MULTIPORT FUEL INJECTION SYSTEM

System Diagram

INFOID:0000000003958638



System Description

INFOID:0000000003958639

INPUT/OUTPUT SIGNAL CHART

Sensor	Input signal to ECM	ECM function	Actuator
Crankshaft position sensor	Engine speed*3		
Camshaft position sensor	Piston position		
Mass air flow sensor	Amount of intake air		
Intake air temperature sensor	Intake air temperature		
Engine coolant temperature sensor	Engine coolant temperature		
Air fuel ratio (A/F) sensor 1	Density of oxygen in exhaust gas		
Throttle position sensor	Throttle position		
Accelerator pedal position sensor	Accelerator pedal position	Fuel injection & mixture ratio control Fuel injector	
TCM	Gear position		Fuel injector
Battery	Battery voltage*3		
Knock sensor	Engine knocking condition		
Power steering pressure sensor	Power steering operation		
Heated oxygen sensor 2*1	Density of oxygen in exhaust gas		
ABS actuator and electric unit (control unit)	VDC/TCS operation command*2	-	
Unified meter and A/C amp.	Vehicle speed & Air conditioner operation* ²		

^{*1:} This sensor is not used to control the engine system under normal conditions.

^{*2:} This signal is sent to the ECM via the CAN communication line.

^{*3:} ECM determines the start signal status by the signals of engine speed and battery voltage.

< SYSTEM DESCRIPTION > [VK50VE]

SYSTEM DESCRIPTION

The amount of fuel injected from the fuel injector is determined by the ECM. The ECM controls the length of time the valve remains open (injection pulse duration). The amount of fuel injected is a program value in the ECM memory. The program value is preset by engine operating conditions. These conditions are determined by input signals (for engine speed and intake air) from the crankshaft position sensor, camshaft position sensor and the mass air flow sensor.

VARIOUS FUEL INJECTION INCREASE/DECREASE COMPENSATION

In addition, the amount of fuel injected is compensated to improve engine performance under various operating conditions as listed below.

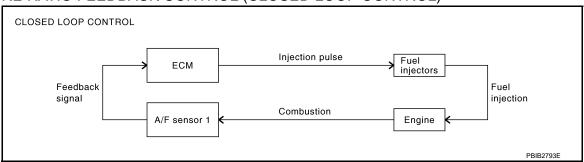
<Fuel increase>

- · During warm-up
- When starting the engine
- During acceleration
- Hot-engine operation
- When selector lever position is changed from N to D
- High-load, high-speed operation

<Fuel decrease>

- During deceleration
- During high engine speed operation

MIXTURE RATIO FEEDBACK CONTROL (CLOSED LOOP CONTROL)



The mixture ratio feedback system provides the best air-fuel mixture ratio for driveability and emission control. The three way catalyst (manifold) can better reduce CO, HC and NOx emissions. This system uses A/F sensor 1 in the exhaust manifold to monitor whether the engine operation is rich or lean. The ECM adjusts the injection pulse width according to the sensor voltage signal. For more information about A/F sensor 1, refer to EC-799, "Description". This maintains the mixture ratio within the range of stoichiometric (ideal air-fuel mixture).

This stage is referred to as the closed loop control condition.

Heated oxygen sensor 2 is located downstream of the three way catalyst (manifold). Even if the switching characteristics of A/F sensor 1 shift, the air-fuel ratio is controlled to stoichiometric by the signal from heated oxygen sensor 2.

Open Loop Control

The open loop system condition refers to when the ECM detects any of the following conditions. Feedback control stops in order to maintain stabilized fuel combustion.

- Deceleration and acceleration
- High-load, high-speed operation
- Malfunction of A/F sensor 1 or its circuit
- Insufficient activation of A/F sensor 1 at low engine coolant temperature
- High engine coolant temperature
- During warm-up
- After shifting from N to D
- When starting the engine

MIXTURE RATIO SELF-LEARNING CONTROL

The mixture ratio feedback control system monitors the mixture ratio signal transmitted from A/F sensor 1. This feedback signal is then sent to the ECM. The ECM controls the basic mixture ratio as close to the theoretical mixture ratio as possible. However, the basic mixture ratio is not necessarily controlled as originally designed. Both manufacturing differences (i.e., mass air flow sensor hot wire) and characteristic changes during operation (i.e., fuel injector clogging) directly affect mixture ratio.

EC

D

Г

. .

1 V I

N

N

0

Р

MULTIPORT FUEL INJECTION SYSTEM

< SYSTEM DESCRIPTION >

[VK50VE]

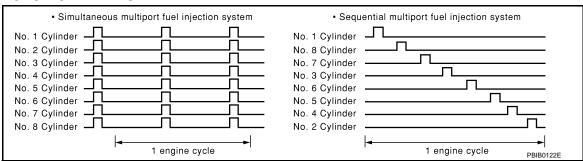
Accordingly, the difference between the basic and theoretical mixture ratios is monitored in this system. This is then computed in terms of "injection pulse duration" to automatically compensate for the difference between the two ratios.

"Fuel trim" refers to the feedback compensation value compared against the basic injection duration. Fuel trim includes "short-term fuel trim" and "long-term fuel trim".

"Short term fuel trim" is the short-term fuel compensation used to maintain the mixture ratio at its theoretical value. The signal from A/F sensor 1 indicates whether the mixture ratio is RICH or LEAN compared to the theoretical value. The signal then triggers a reduction in fuel volume if the mixture ratio is rich, and an increase in fuel volume if it is lean.

"Long-term fuel trim" is overall fuel compensation carried out over time to compensate for continual deviation of the "short-term fuel trim" from the central value. Continual deviation will occur due to individual engine differences, wear over time and changes in the usage environment.

FUEL INJECTION TIMING



Two types of systems are used.

- Sequential Multiport Fuel Injection System
- Fuel is injected into each cylinder during each engine cycle according to the ignition order. This system is used when the engine is running.
- Simultaneous Multiport Fuel Injection System
 - Fuel is injected simultaneously into all eight cylinders twice each engine cycle. In other words, pulse signals of the same width are simultaneously transmitted from the ECM.
 - The eight fuel injectors will then receive the signals 2 times for each engine cycle.
 - This system is used when the engine is being started and/or if the fail-safe system (CPU) is operating.

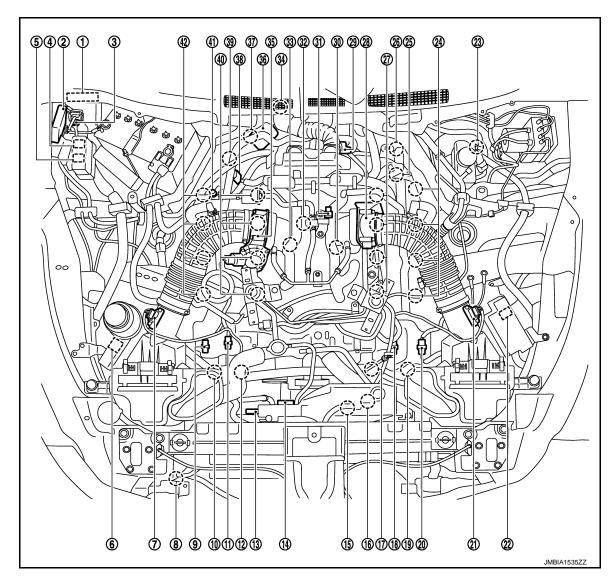
FUEL SHUT-OFF

Fuel to each cylinder is cut off during deceleration, operation of the engine at excessively high speed or operation of the vehicle at excessively high speed.

[VK50VE]

Component Parts Location

INFOID:0000000003958640



- IPDM E/R
- VVEL actuator motor relay
- 7. Mass air flow sensor (bank 2)
- 10. Exhaust valve timing control solenoid valve (bank 2)
- 13. Cooling fan motor-1
- Cooling fan control module-2
- 19. Exhaust valve timing control solenoid valve (bank 1)
- 22. ICC brake hold relay (ICC models)
- 25. VVEL actuator motor (bank 1)
- 28. Electric throttle control actuator (bank 1)

- VVEL control module
- 5. Cooling fan relay-1
- Refrigerant pressure sensor
- 11. Camshaft position sensor (bank 2)
- 14. Cooling fan control module-1
- 17. Intake valve timing control solenoid valve (bank 1)
- 20. Exhaust valve timing control position 21. Mass air flow sensor (with intake air sensor (bank 1)
- 23. Brake booster pressure sensor
- 26. VVEL control shaft position sensor (bank 1)
- 29. A/F sensor 1 (bank 1)

- Battery current sensor
- 6. Cooling fan relay-2
- Exhaust valve timing control position sensor (bank 2)
- Intake valve timing control solenoid valve (bank 2)
- Cooling fan motor-2 15.
- Camshaft position sensor (bank 1) 18.
- temperature sensor) (bank 1)
- 24. Ignition coil (with power transistor) and spark plug (bank 1)
- 27. Fuel injector (bank 1)
- 30. Knock sensor (bank 1)

EC

Α

D

Е

Н

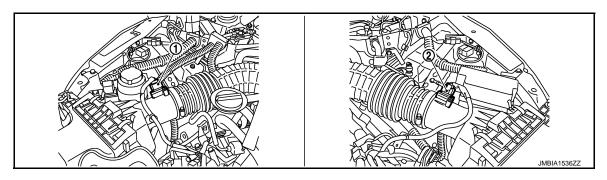
M

Ν

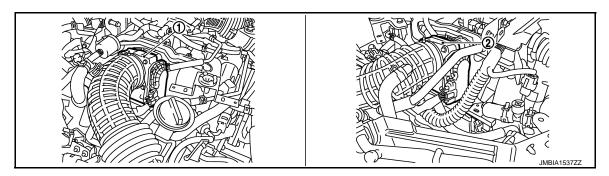
Р

EC-603 Revision: 2009 March 2009 FX35/FX50

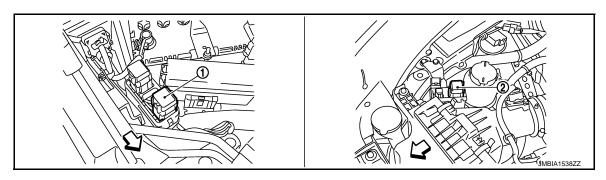
- 33. Knock sensor (bank 2) 31. EVAP canister purge volume con-32. Manifold pressure sensor (This sensor is not for controlling the trol solenoid valve engine system, nor for the on board diagnosis.) 36. VVEL actuator motor (bank 2) 34. Crankshaft position sensor
 - 35. Electric throttle control actuator
 - (bank2)
- 39. Engine coolant temperature sensor
- 37. VVEL control shaft position sensor 38. A/F sensor 1 (bank 2) (bank 2)
- 40. Fuel injector (bank 2)
- 41. EVAP service port
- 42. Ignition coil (with power transistor) and spark plug (bank 2)



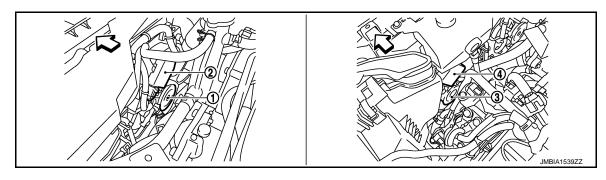
- Mass air flow sensor (bank 2)
- 2. Mass air flow sensor (with intake air temperature sensor) (bank 1)



- Electric throttle control actuator (bank 2)
- 2. Electric throttle control actuator (bank 1)

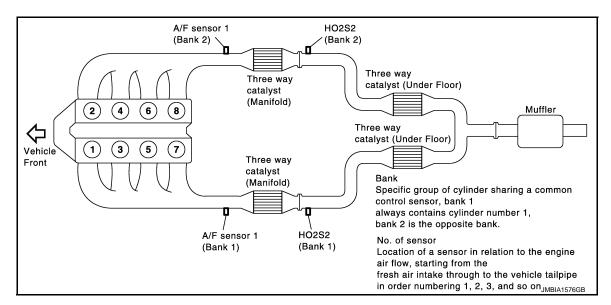


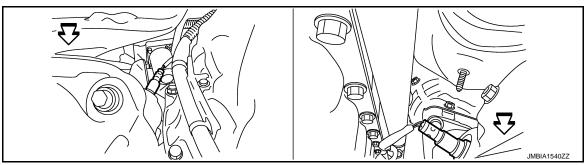
- Cooling fan relay-1
 - 2. Cooling fan relay-2
- ⟨□ Vehicle front



- 1. Cooling fan motor-1
- 2. Cooling fan control module-1
- 3. Cooling fan motor-2

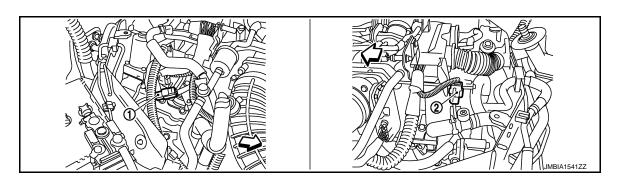
- 4. Cooling fan control module-2
- Vehicle front





- 1. A/F sensor 1 (bank 1)
- 2. A/F sensor 1 (bank 2)

Vehicle front



А

EC

D

Е

G

Н

J

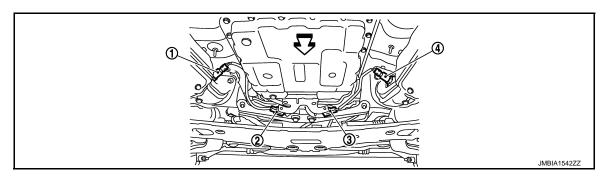
M

Ν

0

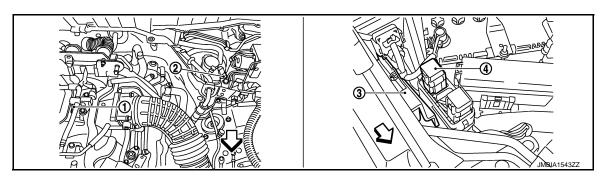
Р

- A/F sensor 1 (bank 2) harness con- 2. nector
- A/F sensor 1 (bank 1) harness connector



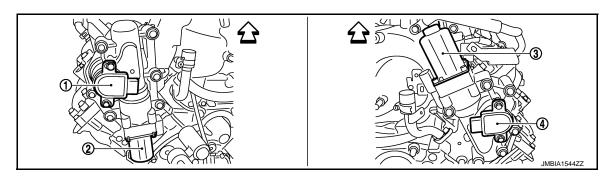
- 1. Heated oxygen sensor 2 (bank 1)
- Heated oxygen sensor 2 (bank 1) harness connector
- Heated oxygen sensor 2 (bank 2) harness connector

- 4. Heated oxygen sensor 2 (bank 2)
- ∀ Vehicle front



- Manifold pressure sensor (This sensor is not for controlling the engine system, nor for the on board diagnosis.)
- 2. Brake booster pressure sensor
- 3. VVEL control module

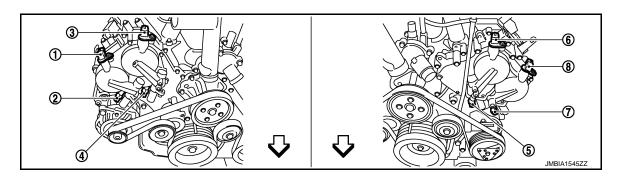
- 4. VVEL actuator motor relay
- ∀ Vehicle front



- VVEL control shaft position sensor (bank 1)
 - 2. VVEL actuator motor (bank 1)
- 3. VVEL actuator motor (bank 2)

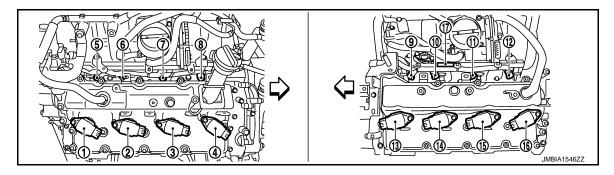
- 4. VVEL control shaft position sensor (bank 2)
- Vehicle front

[VK50VE]



- Exhaust valve timing control position 2. sensor (bank 2)
- Intake valve timing control solenoid valve (bank 2)
- Exhaust valve timing control solenoid 8. valve (bank 1)
- ∀ Vehicle front

- Exhaust valve timing control solenoid 3. valve (bank 2)
- Intake valve timing control solenoid valve (bank 1)
- Exhaust valve timing control position sensor (bank 1)
- Camshaft position sensor (bank 2)
- Camshaft position sensor (bank 1)

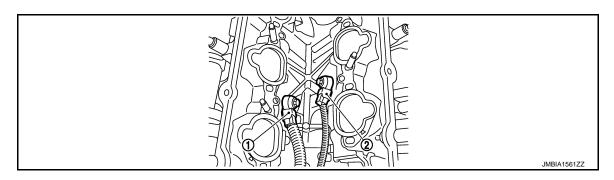


- Ignition coil No.8 (with power transis- 2.
- Ignition coil No.2 (with power transis- 5. tor)
- 7. Fuel injector No.4
- 10. Fuel injector No.3
- 13. Ignition coil No.1 (with power transis- 14.
- 16. Ignition coil No.7 (with power transis- 17. Condenser tor)

- Ignition coil No.6 (with power transis- 3.
- Fuel injector No.8
- Fuel injector No.2
- 11. Fuel injector No.5
- Ignition coil No.3 (with power transis- 15.

- Ignition coil No.4 (with power transistor)
- Fuel injector No.6
- 9. Fuel injector No.1
- 12. Fuel injector No.7
 - Ignition coil No.5 (with power transistor)

∀ Vehicle front



Knock sensor (bank 2)

Knock sensor (bank 1)

EC-607 Revision: 2009 March 2009 FX35/FX50

Α

EC

D

Е

F

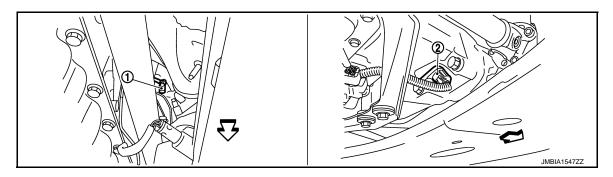
Н

K

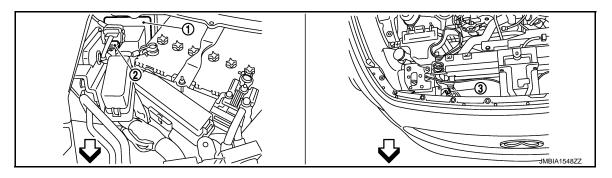
M

Ν

Р



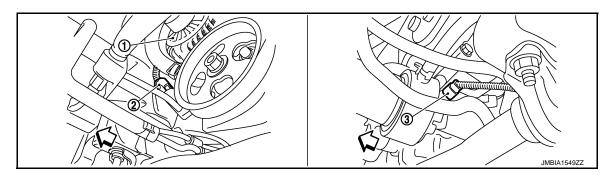
- I. Engine coolant temperature sensor 2. Crankshaft position sensor
- ∀ Vehicle front



1. IPDM E/R

- 2. Battery current sensor
- 3. Refrigerant pressure sensor

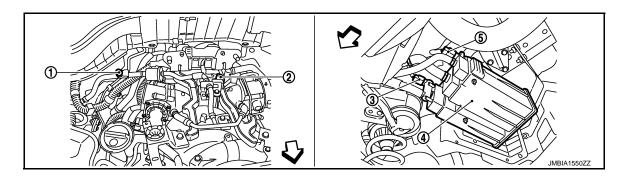
∀ Vehicle front



1. Alternator

- 2. Power steering pressure sensor
- 3. Engine oil temperature sensor





MULTIPORT FUEL INJECTION SYSTEM

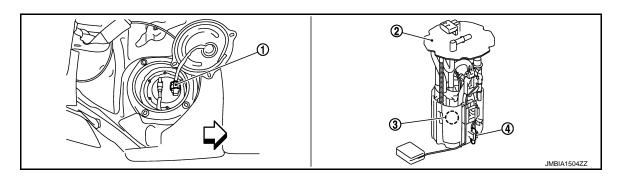
< SYSTEM DESCRIPTION > [VK50VE]

- EVAP service port
- 2. EVAP canister purge volume control 3. EVAP canister vent control valve solenoid valve

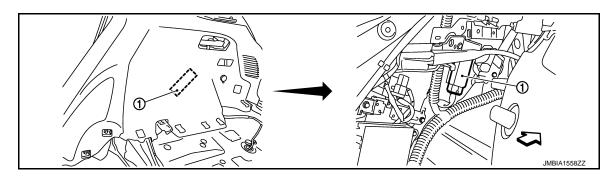
4. EVAP canister

EVAP control system pressure sensor

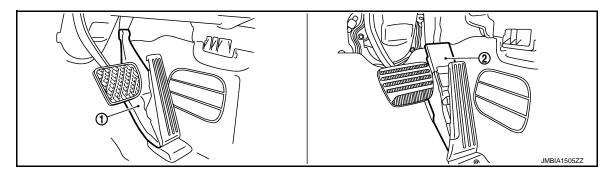
Vehicle front



- Fuel level sensor unit and fuel pump 2. Fuel level sensor unit and fuel pump 3. Fuel pressure regulator harness connector
- 4. Fuel tank temperature sensor
- ∀ Vehicle front



- 1. FPCM



- Accelerator pedal position sensor (without DCA system)
- Accelerator pedal position sensor (with DCA system)

EC

Α

D

Е

-

G

Н

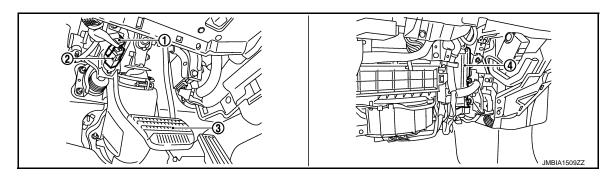
-

M

Ν

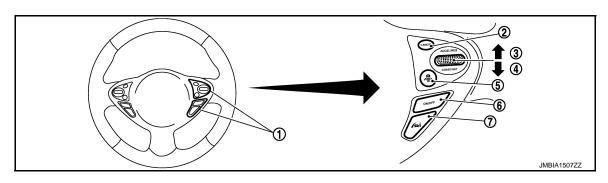
0

Р



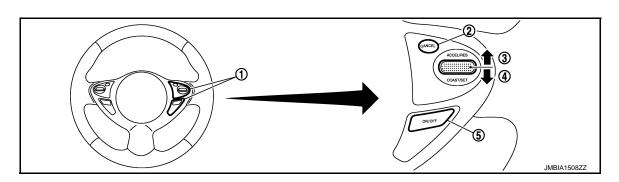
- Stop lamp switch
- 2. ASCD brake switch (ASCD models) 3. ICC brake switch (ICC models)
 - Brake pedal

4. ECM



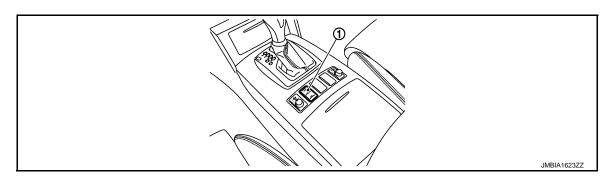
- 1. ICC steering switch
- 4. SET/COAST switch
- 7. LDP switch

- 2. CANCEL switch
- 5. DISTANCE switch
- 3. RESUME/ACCELERATE switch
- 6. MAIN switch



- ASCD steering switch
- 4. SET/COAST switch
- 2. CANCEL switch
- 5. MAIN switch

RESUME/ACCELERATE switch



1. Snow mode switch

MULTIPORT FUEL INJECTION SYSTEM

< SYSTEM DESCRIPTION >

[VK50VE]

Component Description

INFOID:0000000003958641

Α

EC

D

Е

F

Component	Reference	
A/F sensor 1	EC-799, "Description"	
Accelerator pedal position sensor	EC-1067, "Description"	
Camshaft position sensor	EC-871, "Description"	
Crankshaft position sensor	EC-867, "Description"	
Engine coolant temperature sensor	EC-784, "Description"	
Fuel injector	EC-1096, "Description"	
Heated oxygen sensor 2	EC-814, "Description"	
Intake air temperature sensor	EC-781, "Description"	
Knock sensor	EC-864, "Description"	
Mass air flow sensor	EC-768, "Description"	
Power steering pressure sensor	EC-951, "Description"	
Throttle position sensor	EC-789, "Description"	

G

Н

J

K

L

M

Ν

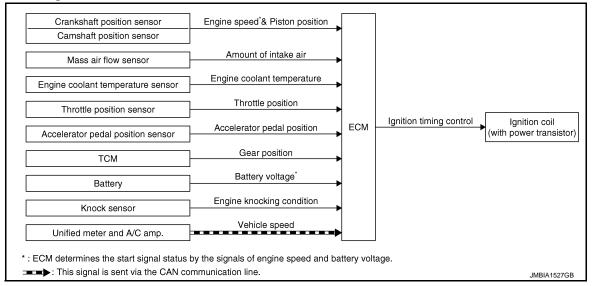
0

Ρ

ELECTRIC IGNITION SYSTEM

System Diagram

INFOID:0000000003958642



System Description

INFOID:0000000003958643

INPUT/OUTPUT SIGNAL CHART

Sensor	Input signal to ECM	ECM function	Actuator
Crankshaft position sensor	nsor Engine speed*2		
Camshaft position sensor	Piston position		Ignition coil (with power transistor)
Mass air flow sensor	Amount of intake air		
Engine coolant temperature sensor	Engine coolant temperature		
Throttle position sensor	Throttle position	Ignition timing control	
Accelerator pedal position sensor	Accelerator pedal position		
ТСМ	Gear position		
Battery	Battery voltage*2		
Knock sensor	Engine knocking		
Unified meter and A/C amp.	Vehicle speed*1		

^{*1:} This signal is sent to the ECM via the CAN communication line.

SYSTEM DESCRIPTION

Ignition order: 1 - 8 - 7 - 3 - 6 - 5 - 4 - 2

The ignition timing is controlled by the ECM to maintain the best air-fuel ratio for every running condition of the engine. The ignition timing data is stored in the ECM.

The ECM receives information such as the injection pulse width and camshaft position sensor signal. Computing this information, ignition signals are transmitted to the power transistor.

During the following conditions, the ignition timing is revised by the ECM according to the other data stored in the ECM.

- At starting
- During warm-up
- At idle
- At low battery voltage
- During acceleration

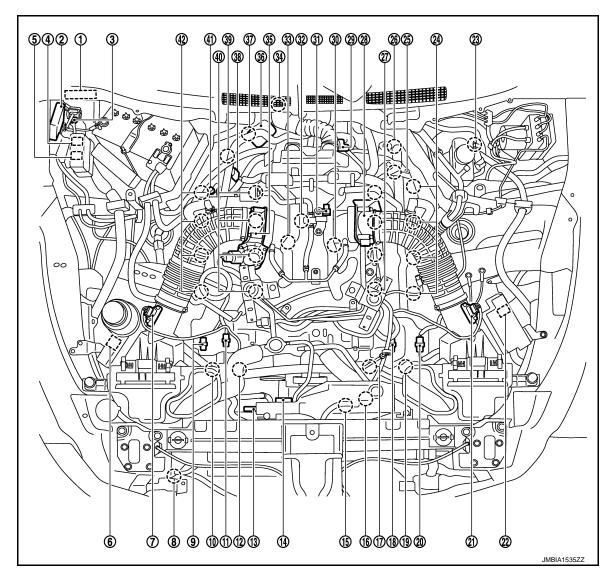
The knock sensor retard system is designed only for emergencies. The basic ignition timing is programmed within the anti-knocking zone, if recommended fuel is used under dry conditions. The retard system does not

^{*2:} ECM determines the start signal status by the signals of engine speed and battery voltage.

operate under normal driving conditions. If engine knocking occurs, the knock sensor monitors the condition. The signal is transmitted to the ECM. The ECM retards the ignition timing to eliminate the knocking condition.

Component Parts Location

INFOID:0000000003958644



- IPDM E/R 1.
- 4. VVEL actuator motor relay
- 7. Mass air flow sensor (bank 2)
- Exhaust valve timing control solenoid valve (bank 2)
- 13. Cooling fan motor-1
- Cooling fan control module-2
- 19. Exhaust valve timing control solenoid valve (bank 1)
- 22. ICC brake hold relay (ICC models)
- 25. VVEL actuator motor (bank 1)
- 28. Electric throttle control actuator (bank 1)

- 2. VVEL control module
- 5. Cooling fan relay-1
- 8. Refrigerant pressure sensor
- 11. Camshaft position sensor (bank 2)
- 14. Cooling fan control module-1
- 17. Intake valve timing control solenoid
- valve (bank 1) 20. Exhaust valve timing control position
- sensor (bank 1)
- 23. Brake booster pressure sensor
- 26. VVEL control shaft position sensor (bank 1)
- 29. A/F sensor 1 (bank 1)

- Battery current sensor 3.
- 6. Cooling fan relay-2
- Exhaust valve timing control position sensor (bank 2)
- 12. Intake valve timing control solenoid valve (bank 2)
- Cooling fan motor-2
- 18. Camshaft position sensor (bank 1)
- 21. Mass air flow sensor (with intake air temperature sensor) (bank 1)
- Ignition coil (with power transistor) 24. and spark plug (bank 1)
- 27. Fuel injector (bank 1)

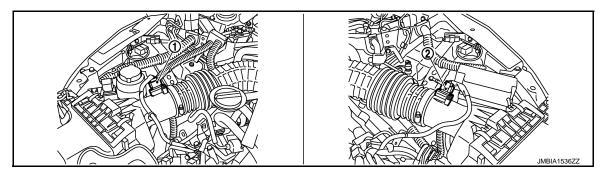
EC

Н

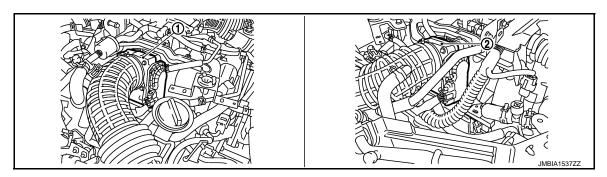
Ν

and spark plug (bank 2)

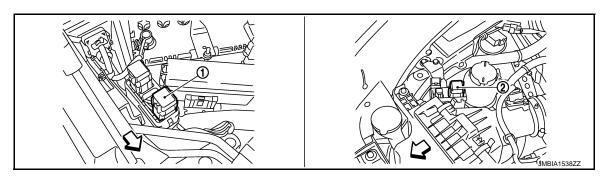
33. Knock sensor (bank 2) 31. EVAP canister purge volume con-32. Manifold pressure sensor (This sensor is not for controlling the trol solenoid valve engine system, nor for the on board diagnosis.) 35. Electric throttle control actuator 36. VVEL actuator motor (bank 2) 34. Crankshaft position sensor (bank2) 37. VVEL control shaft position sensor 38. A/F sensor 1 (bank 2) 39. Engine coolant temperature sensor (bank 2) 40. Fuel injector (bank 2) 41. EVAP service port 42. Ignition coil (with power transistor)



- 1. Mass air flow sensor (bank 2)
- 2. Mass air flow sensor (with intake air temperature sensor) (bank 1)

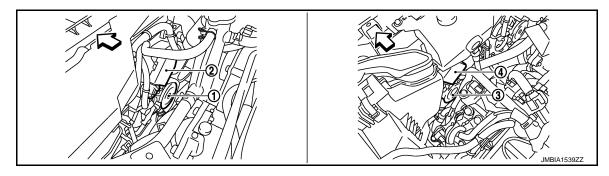


- . Electric throttle control actuator (bank 2)
- 2. Electric throttle control actuator (bank 1)



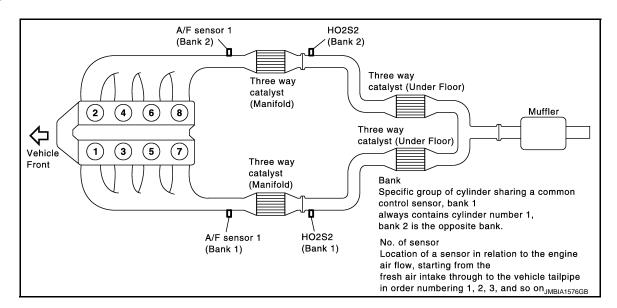
- 1. Cooling fan relay-1
- ⟨□ Vehicle front

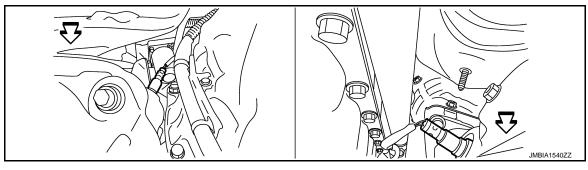
2. Cooling fan relay-2



- 1. Cooling fan motor-1
- 2. Cooling fan control module-1
- 3. Cooling fan motor-2

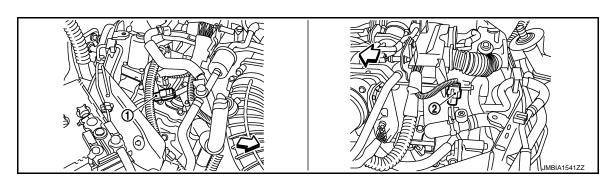
- 4. Cooling fan control module-2
- Vehicle front





- 1. A/F sensor 1 (bank 1)
- 2. A/F sensor 1 (bank 2)

Vehicle front



А

EC

D

Е

F

G

Н

J

. .

M

Ν

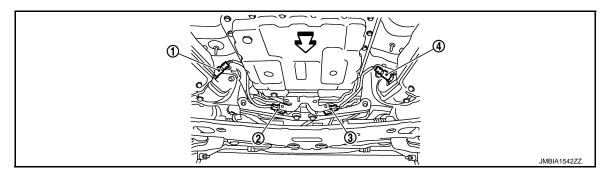
0

Р

Revision: 2009 March EC-615 2009 FX35/FX50

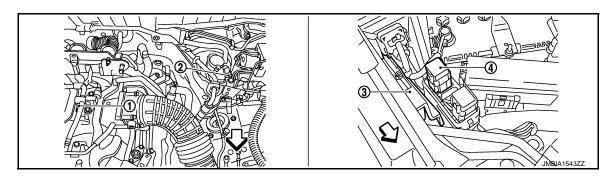
- A/F sensor 1 (bank 2) harness con- 2. nector
- ⟨
 → Vehicle front

A/F sensor 1 (bank 1) harness connector



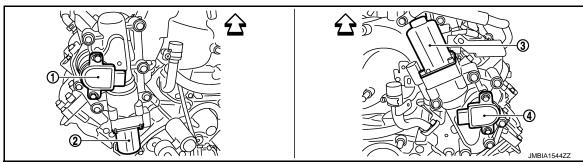
- Heated oxygen sensor 2 (bank 1)
- Heated oxygen sensor 2 (bank 1) harness connector
- Heated oxygen sensor 2 (bank 2) harness connector

- Heated oxygen sensor 2 (bank 2)
- ∀ Vehicle front



- Manifold pressure sensor (This sensor is not for controlling the engine system, nor for the on board diagnosis.)
- Brake booster pressure sensor
- VVEL control module 3.

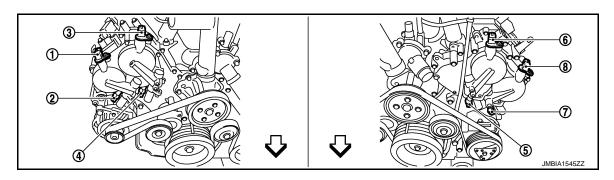
- VVEL actuator motor relay
- ∀ Vehicle front



2. VVEL actuator motor (bank 1)

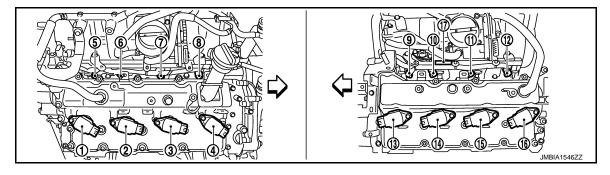
- VVEL control shaft position sensor (bank 1)
 - VVEL control shaft position sensor (bank 2)
- ∀ Vehicle front

- - VVEL actuator motor (bank 2)



- Exhaust valve timing control position 2. sensor (bank 2)
- Intake valve timing control solenoid valve (bank 2)
- Exhaust valve timing control solenoid 8. valve (bank 1)
- ∀ Vehicle front

- Exhaust valve timing control solenoid 3. valve (bank 2)
- Intake valve timing control solenoid valve (bank 1)
- Exhaust valve timing control position sensor (bank 1)
- Camshaft position sensor (bank 2)
- Camshaft position sensor (bank 1)

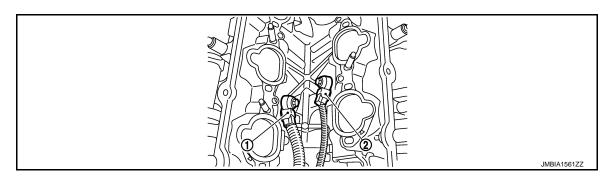


- Ignition coil No.8 (with power transis- 2.
- Ignition coil No.2 (with power transis- 5. 4. tor)
- 7. Fuel injector No.4
- 10. Fuel injector No.3
- 13. Ignition coil No.1 (with power transis- 14.
- 16. Ignition coil No.7 (with power transis- 17. Condenser tor)

- Ignition coil No.6 (with power transis- 3.
- Fuel injector No.8
- Fuel injector No.2
- 11. Fuel injector No.5
- Ignition coil No.3 (with power transis- 15.

- Ignition coil No.4 (with power transistor)
- Fuel injector No.6
- 9. Fuel injector No.1
- 12. Fuel injector No.7
 - Ignition coil No.5 (with power transistor)

∀ Vehicle front



Knock sensor (bank 2)

Knock sensor (bank 1)

EC-617 Revision: 2009 March 2009 FX35/FX50

Α

EC

D

Е

F

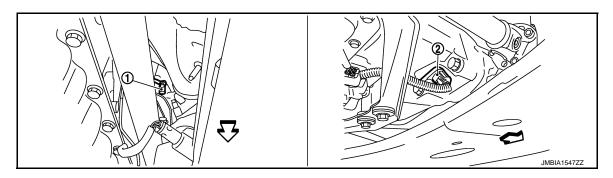
Н

K

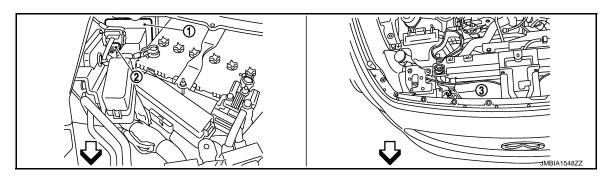
M

Ν

Ρ



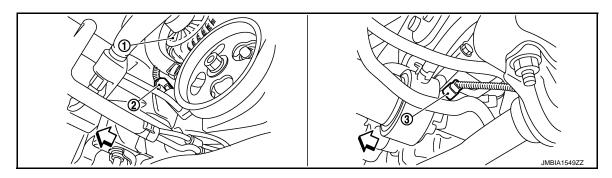
- 1. Engine coolant temperature sensor 2. Crankshaft position sensor
- ∀ Vehicle front



1. IPDM E/R

- 2. Battery current sensor
- 3. Refrigerant pressure sensor

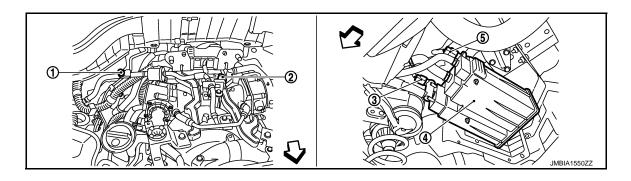
∀ Vehicle front



1. Alternator

- 2. Power steering pressure sensor
- 3. Engine oil temperature sensor





ELECTRIC IGNITION SYSTEM

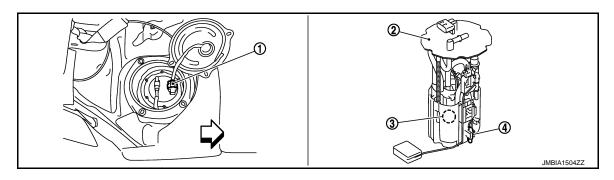
< SYSTEM DESCRIPTION > [VK50VE]

- 1. EVAP service port
- EVAP canister purge volume control 3. EVAP canister vent control valve solenoid valve

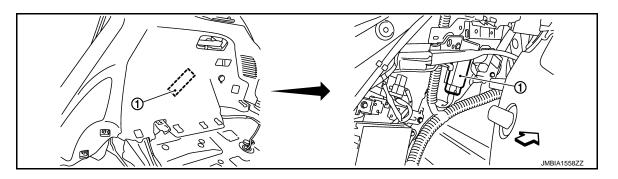
4. EVAP canister

5. EVAP control system pressure sensor

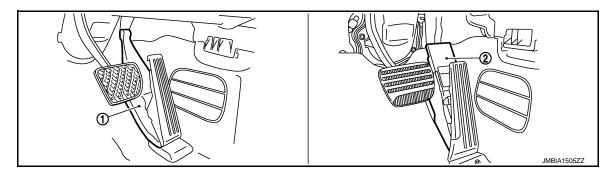
Vehicle front



- Fuel level sensor unit and fuel pump 2. Fuel level sensor unit and fuel pump 3. Fuel pressure regulator harness connector
- 4. Fuel tank temperature sensor
- ∀ Vehicle front



- 1. FPCM



- Accelerator pedal position sensor (without DCA system)
- Accelerator pedal position sensor (with DCA system)

EC

Α

D

Е

F

G

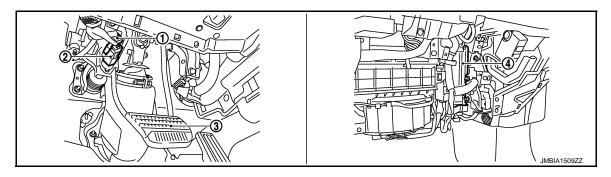
Н

J

M

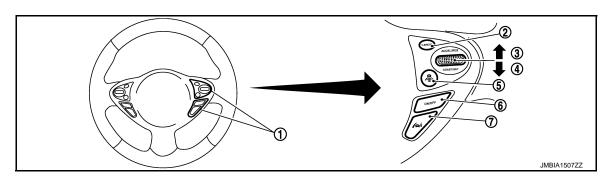
Ν

0



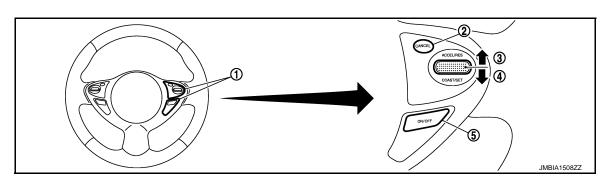
- Stop lamp switch
- 2. ASCD brake switch (ASCD models) 3. ICC brake switch (ICC models)
 - Brake pedal

4. ECM



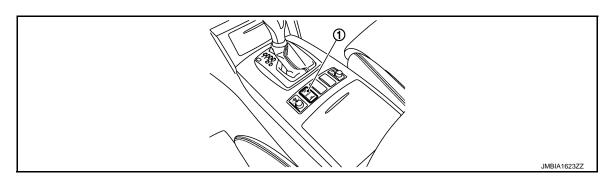
- 1. ICC steering switch
- 4. SET/COAST switch
- 7. LDP switch

- 2. CANCEL switch
- 5. DISTANCE switch
- 3. RESUME/ACCELERATE switch
- 6. MAIN switch



- 1. ASCD steering switch
- 4. SET/COAST switch
- 2. CANCEL switch
- 5. MAIN switch

3. RESUME/ACCELERATE switch



1. Snow mode switch

ELECTRIC IGNITION SYSTEM

< SYSTEM DESCRIPTION >

[VK50VE]

Component Description

INFOID:0000000003958645

Component	Reference	
Accelerator pedal position sensor	EC-1067, "Description"	EC
Camshaft position sensor	EC-871, "Description"	
Crankshaft position sensor	EC-867, "Description"	
Engine coolant temperature sensor	EC-784, "Description"	
Knock sensor	EC-864, "Description"	
Mass air flow sensor	EC-768, "Description"	D
Throttle position sensor	EC-789, "Description"	

Е

Α

F

G

Н

Κ

L

M

Ν

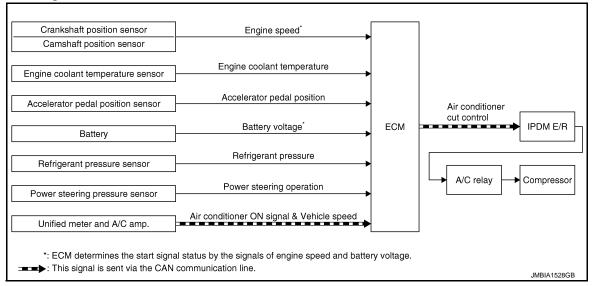
0

Ρ

AIR CONDITIONING CUT CONTROL

System Diagram

INFOID:0000000003958646



System Description

INFOID:0000000003958647

INPUT/OUTPUT SIGNAL CHART

Sensor	Input signal to ECM	ECM function	Actuator
Crankshaft position sensor Camshaft position sensor	Engine speed*2		IPDM E/R ↓ A/C relay ↓ Compressor
Engine coolant temperature sensor	Engine coolant temperature		
Accelerator pedal position sensor	Accelerator pedal position		
Battery	Battery voltage*2	Air conditioner	
Refrigerant pressure sensor	Refrigerant pressure	cut control	
Power steering pressure sensor	Power steering operation		
Unified meter and A/C amp.	Air conditioner ON signal*1		
	Vehicle speed*1		

^{*1:} This signal is sent to the ECM via the CAN communication line.

SYSTEM DESCRIPTION

This system improves engine operation when the air conditioner is used.

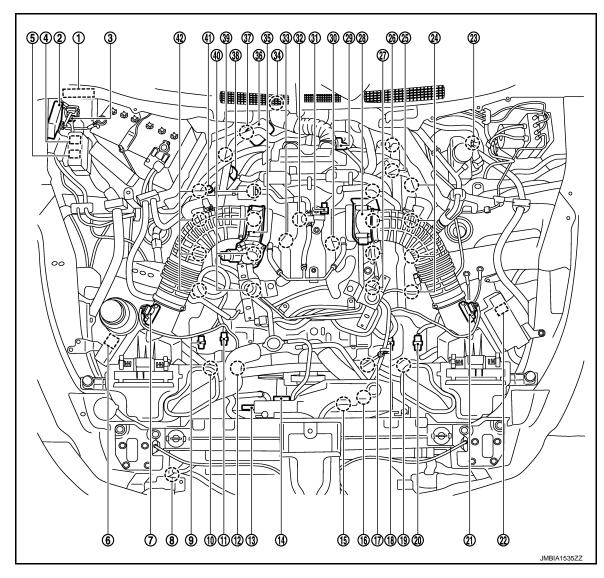
Under the following conditions, the air conditioner is turned off.

- When the accelerator pedal is fully depressed.
- When cranking the engine.
- At high engine speeds.
- When the engine coolant temperature becomes excessively high.
- When operating power steering during low engine speed or low vehicle speed.
- When engine speed is excessively low.
- When refrigerant pressure is excessively low or high.

^{*2:} ECM determines the start signal status by the signals of engine speed and battery voltage.

Component Parts Location

INFOID:0000000003958648



- IPDM E/R
- VVEL actuator motor relay
- 7. Mass air flow sensor (bank 2)
- 10. Exhaust valve timing control solenoid valve (bank 2)
- 13. Cooling fan motor-1
- Cooling fan control module-2
- 19. Exhaust valve timing control solenoid valve (bank 1)
- 22. ICC brake hold relay (ICC models)
- 25. VVEL actuator motor (bank 1)
- 28. Electric throttle control actuator (bank 1)

- VVEL control module
- 5. Cooling fan relay-1
- Refrigerant pressure sensor
- 11. Camshaft position sensor (bank 2)
- 14. Cooling fan control module-1
- 17. Intake valve timing control solenoid valve (bank 1)
- sensor (bank 1)
- 23. Brake booster pressure sensor
- 26. VVEL control shaft position sensor (bank 1)
- 29. A/F sensor 1 (bank 1)

- Battery current sensor
- 6. Cooling fan relay-2
- Exhaust valve timing control position sensor (bank 2)
- Intake valve timing control solenoid valve (bank 2)
- Cooling fan motor-2 15.
- Camshaft position sensor (bank 1) 18.
- 20. Exhaust valve timing control position 21. Mass air flow sensor (with intake air temperature sensor) (bank 1)
 - 24. Ignition coil (with power transistor) and spark plug (bank 1)
 - 27. Fuel injector (bank 1)
 - 30. Knock sensor (bank 1)

EC

Α

D

Е

Н

M

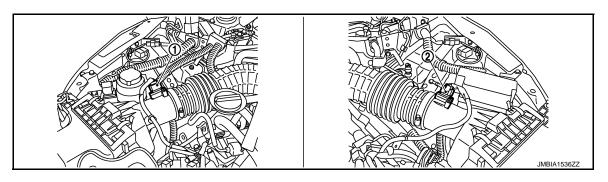
Ν

42. Ignition coil (with power transistor) and spark plug (bank 2)

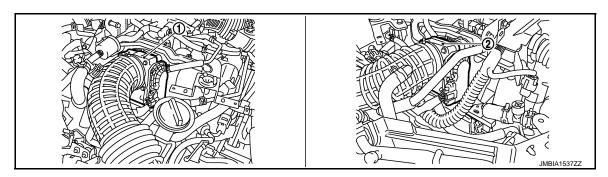
40. Fuel injector (bank 2)

EVAP canister purge volume control solenoid valve
 (This sensor is not for controlling the engine system, nor for the on board diagnosis.)
 Crankshaft position sensor
 Electric throttle control actuator (bank 2)
 VVEL control shaft position sensor (bank 2)
 A/F sensor 1 (bank 2)
 Engine coolant temperature sensor (bank 2)

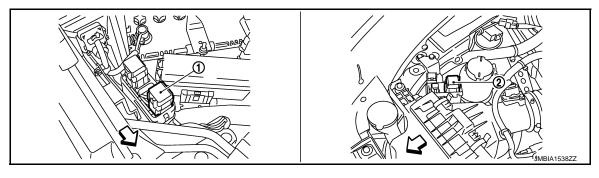
41. EVAP service port



- 1. Mass air flow sensor (bank 2)
- 2. Mass air flow sensor (with intake air temperature sensor) (bank 1)

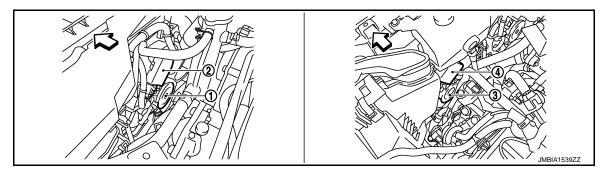


- . Electric throttle control actuator (bank 2)
- 2. Electric throttle control actuator (bank 1)



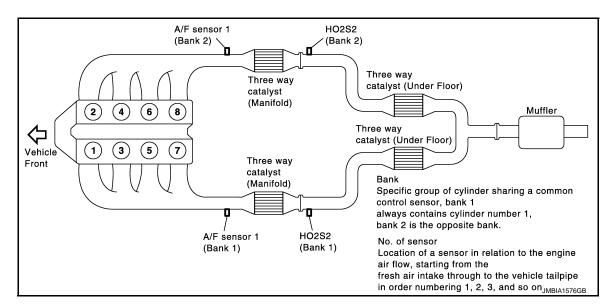
- 1. Cooling fan relay-1
- ⟨□ Vehicle front

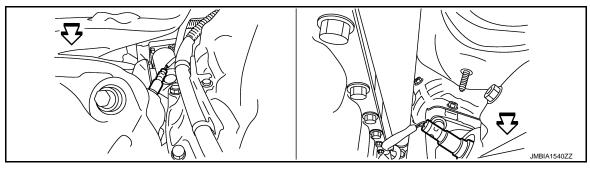
2. Cooling fan relay-2



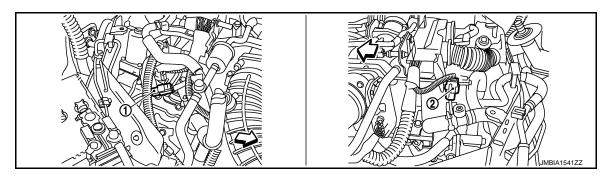
- 1. Cooling fan motor-1
- 2. Cooling fan control module-1
- 3. Cooling fan motor-2

- 4. Cooling fan control module-2
- Vehicle front





- 1. A/F sensor 1 (bank 1)
- 2. A/F sensor 1 (bank 2)



Revision: 2009 March EC-625 2009 FX35/FX50

EC

Α

D

Е

F

G

Н

J

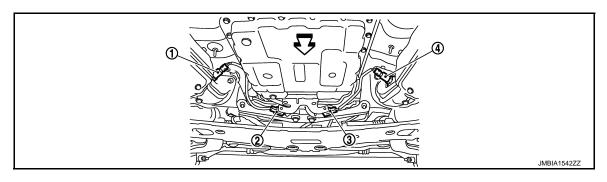
M

Ν

0

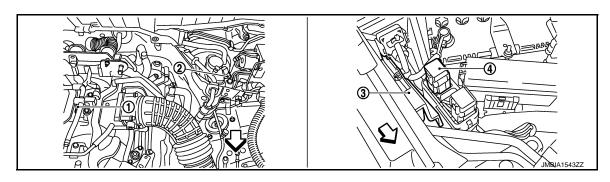
- A/F sensor 1 (bank 2) harness con- 2. nector
- A/F sensor 1 (bank 1) harness connector

⟨
→ Vehicle front



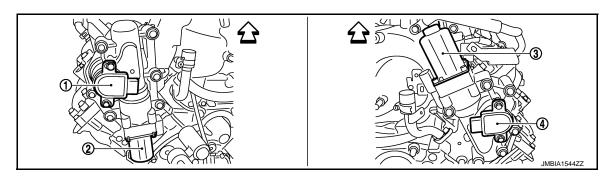
- 1. Heated oxygen sensor 2 (bank 1)
- Heated oxygen sensor 2 (bank 1) harness connector
- Heated oxygen sensor 2 (bank 2) harness connector

- 4. Heated oxygen sensor 2 (bank 2)
- ∀ Vehicle front



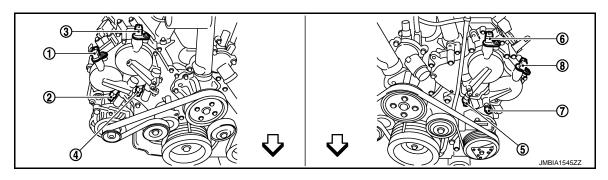
- Manifold pressure sensor (This sensor is not for controlling the engine system, nor for the on board diagnosis.)
- Brake booster pressure sensor
- 3. VVEL control module

- 4. VVEL actuator motor relay
- ∀ Vehicle front



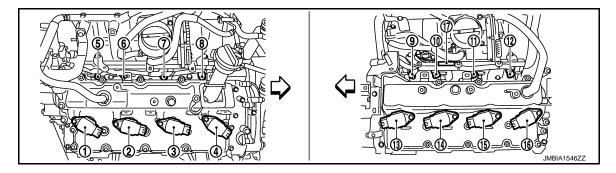
- VVEL control shaft position sensor (bank 1)
 - or 2. VVEL actuator motor (bank 1)
- 3. VVEL actuator motor (bank 2)

- 4. VVEL control shaft position sensor (bank 2)
- Vehicle front



- Exhaust valve timing control position 2. sensor (bank 2)
- Intake valve timing control solenoid valve (bank 2)
- Exhaust valve timing control solenoid 8. valve (bank 1)
- ∀ Vehicle front

- Exhaust valve timing control solenoid 3. valve (bank 2)
- Intake valve timing control solenoid valve (bank 1)
- Exhaust valve timing control position sensor (bank 1)
- Camshaft position sensor (bank 2)
- Camshaft position sensor (bank 1)

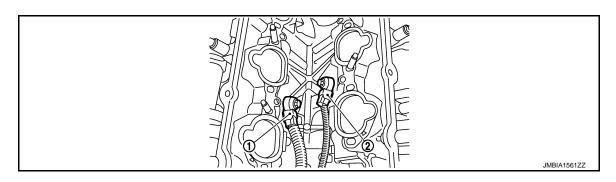


- Ignition coil No.8 (with power transis- 2.
- Ignition coil No.2 (with power transis- 5. tor)
- 7. Fuel injector No.4
- 10. Fuel injector No.3
- 13. Ignition coil No.1 (with power transis- 14.
- 16. Ignition coil No.7 (with power transis- 17. Condenser
- tor)

- Ignition coil No.6 (with power transis- 3.
- Fuel injector No.8
- Fuel injector No.2
- 11. Fuel injector No.5
- Ignition coil No.3 (with power transis- 15.

- Ignition coil No.4 (with power transistor)
- Fuel injector No.6
- 9. Fuel injector No.1
- 12. Fuel injector No.7
 - Ignition coil No.5 (with power transistor)

∀ Vehicle front



Knock sensor (bank 2)

Knock sensor (bank 1)

EC-627 Revision: 2009 March 2009 FX35/FX50

Α

EC

D

Е

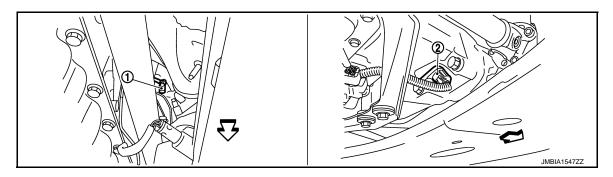
F

Н

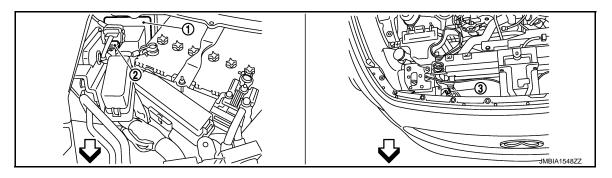
K

M

Ν



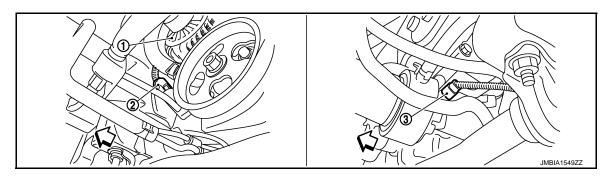
- 1. Engine coolant temperature sensor 2. Crankshaft position sensor
- ∀ Vehicle front



1. IPDM E/R

- 2. Battery current sensor
- 3. Refrigerant pressure sensor

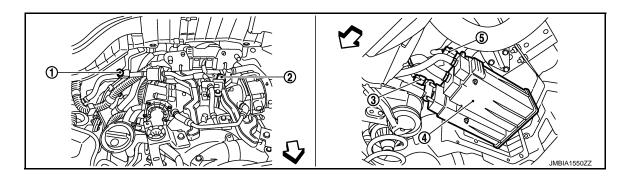
∀ Vehicle front



1. Alternator

- 2. Power steering pressure sensor
- 3. Engine oil temperature sensor

∀ Vehicle front



AIR CONDITIONING CUT CONTROL

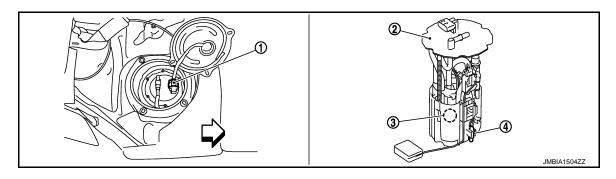
< SYSTEM DESCRIPTION > [VK50VE]

- EVAP service port
- EVAP canister purge volume control 3. EVAP canister vent control valve solenoid valve

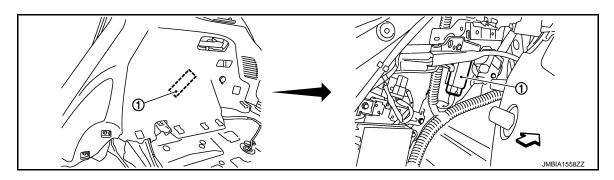
4. EVAP canister

5. EVAP control system pressure sensor

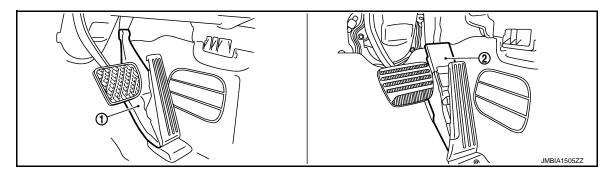
Vehicle front



- Fuel level sensor unit and fuel pump 2. Fuel level sensor unit and fuel pump 3. Fuel pressure regulator harness connector
- 4. Fuel tank temperature sensor
- ∀ Vehicle front



- 1. FPCM



- Accelerator pedal position sensor (without DCA system)
- Accelerator pedal position sensor (with DCA system)

EC

Α

D

Е

F

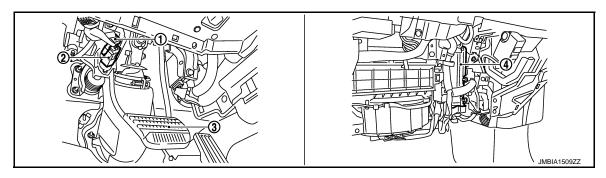
G

Н

M

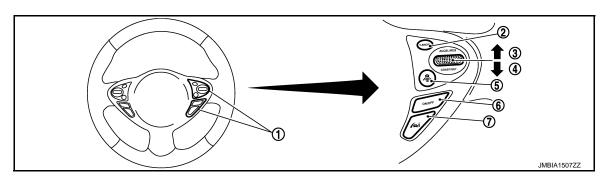
Ν

0



- Stop lamp switch
- 2. ASCD brake switch (ASCD models) 3. ICC brake switch (ICC models)

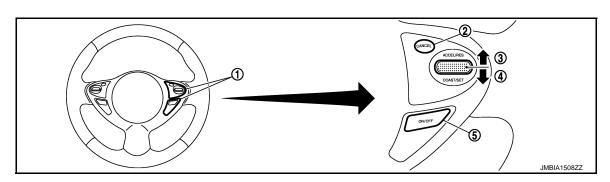
4. ECM



- 1. ICC steering switch
- 4. SET/COAST switch
- 7. LDP switch

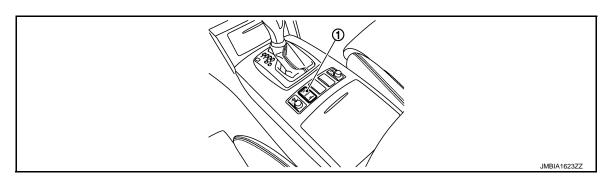
- 2. CANCEL switch
- 5. DISTANCE switch
- 3. RESUME/ACCELERATE switch
- 6. MAIN switch

Brake pedal



- ASCD steering switch
 SET/COAST switch
- CANCEL switch
- 5. MAIN switch

3. RESUME/ACCELERATE switch



1. Snow mode switch

AIR CONDITIONING CUT CONTROL

< SYSTEM DESCRIPTION >

[VK50VE]

Component Description

INFOID:0000000003958649

Component	Reference
Accelerator pedal position sensor	EC-1067, "Description"
Camshaft position sensor	EC-871, "Description"
Crankshaft position sensor	EC-867, "Description"
Engine coolant temperature sensor	EC-784, "Description"
Power steering pressure sensor	EC-951, "Description"
Refrigerant pressure sensor	EC-1122, "Description"

D

С

Α

EC

Е

F

G

Н

1

K

L

M

Ν

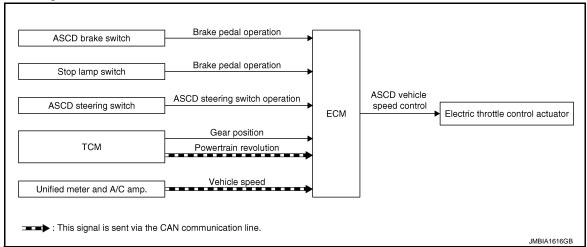
0

Ρ

AUTOMATIC SPEED CONTROL DEVICE (ASCD)

System Diagram

INFOID:0000000003958650



System Description

INFOID:0000000003958651

INPUT/OUTPUT SIGNAL CHART

Sensor	Input signal to ECM	ECM function	Actuator
ASCD brake switch	Brake pedal operation	ASCD vehicle speed control	Electric throttle control actuator
Stop lamp switch	Brake pedal operation		
ASCD steering switch	ASCD steering switch operation		
TCM	Gear position Powertrain revolution*	The second secon	
Unified meter and A/C amp.	Vehicle speed*		

^{*:} This signal is sent to the ECM via the CAN communication line

BASIC ASCD SYSTEM

Refer to Owner's Manual for ASCD operating instructions.

Automatic Speed Control Device (ASCD) allows a driver to keep vehicle at predetermined constant speed without depressing accelerator pedal. Driver can set vehicle speed in advance between approximately 40 km/h (25 MPH) and 144 km/h (89 MPH).

ECM controls throttle angle of electric throttle control actuator to regulate engine speed.

Operation status of ASCD is indicated by CRUISE indicator and SET indicator in combination meter. If any malfunction occurs in the ASCD system, CRUISE lamp blinks and ASCD control is deactivated.

NOTE:

Always drive vehicle in a safe manner according to traffic conditions and obey all traffic laws.

SET OPERATION

Press MAIN switch. (The CRUISE indicator in combination meter is displayed.)

When vehicle speed reaches a desired speed between approximately 40 km/h (25 MPH) and 144 km/h (89 MPH), press SET/COAST switch. (Then SET indicator in combination meter is displayed.)

ACCELERATE OPERATION

If the RESUME/ACCELERATE switch is pressed during cruise control driving, increase the vehicle speed until the switch is released or vehicle speed reaches maximum speed controlled by the system. And then ASCD will maintain the new set speed.

CANCEL OPERATION

When any of following conditions exist, cruise operation will be canceled.

- CANCEL switch is pressed
- More than 2 switches on ASCD steering switch are pressed at the same time (Set speed will be cleared)
- · Brake pedal is depressed

AUTOMATIC SPEED CONTROL DEVICE (ASCD)

< SYSTEM DESCRIPTION > [VK50VE]

- Selector lever position is changed to N, P or R
- Vehicle speed decreased to 13 km/h (8 MPH) lower than the set speed
- TCS system is operated

When the ECM detects any of the following conditions, the ECM will cancel the cruise operation and inform the driver by blinking CRUISE lamp.

- Engine coolant temperature is slightly higher than the normal operating temperature, CRUISE lamp may blink slowly.
- When the engine coolant temperature decreases to the normal operating temperature, CRUISE lamp will stop blinking and the cruise operation will be able to work by pressing SET/COAST switch or RESUME/ACCELERATE switch.
- Malfunction for some self-diagnoses regarding ASCD control: SET indicator will blink quickly.

If MAIN switch is turned to OFF while ASCD is activated, all of ASCD operations will be canceled and vehicle speed memory will be erased.

COAST OPERATION

When the SET/COAST switch is pressed during cruise control driving, decrease vehicle set speed until the switch is released. And then ASCD will maintain the new set speed.

RESUME OPERATION

When the RESUME/ACCELERATE switch is pressed after canceling operation other than pressing the MAIN switch, vehicle speed will return to last set speed. To resume vehicle set speed, vehicle condition must meet following conditions.

- · Brake pedal is released
- A/T selector lever position is other than P and N
- Vehicle speed is greater than 40 km/h (25 MPH) and less than 144 km/h (89 MPH)

EC

Α

D

Н

ī

K

L

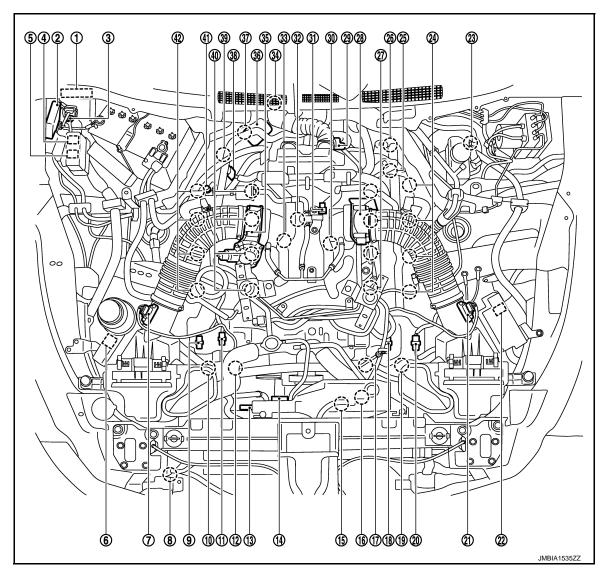
M

Ν

0

Component Parts Location

INFOID:0000000003958652



- IPDM E/R
- VVEL actuator motor relay
- Mass air flow sensor (bank 2)
- Exhaust valve timing control solenoid valve (bank 2)
- 13. Cooling fan motor-1
- Cooling fan control module-2
- 19. Exhaust valve timing control solenoid valve (bank 1)
- 22. ICC brake hold relay (ICC models)
- 25. VVEL actuator motor (bank 1)
- 28. Electric throttle control actuator (bank 1)

- 2. VVEL control module
- 5. Cooling fan relay-1
- Refrigerant pressure sensor
- 11. Camshaft position sensor (bank 2)
- 14. Cooling fan control module-1
- 17. Intake valve timing control solenoid valve (bank 1)
- 20. Exhaust valve timing control position 21. Mass air flow sensor (with intake air sensor (bank 1)
- 23. Brake booster pressure sensor
- 26. VVEL control shaft position sensor (bank 1)
- 29. A/F sensor 1 (bank 1)

- Battery current sensor
- 6. Cooling fan relay-2
- Exhaust valve timing control position sensor (bank 2)
- 12. Intake valve timing control solenoid valve (bank 2)
- 15. Cooling fan motor-2
- Camshaft position sensor (bank 1)
- temperature sensor) (bank 1)
- 24. Ignition coil (with power transistor) and spark plug (bank 1)
- 27. Fuel injector (bank 1)
- 30. Knock sensor (bank 1)

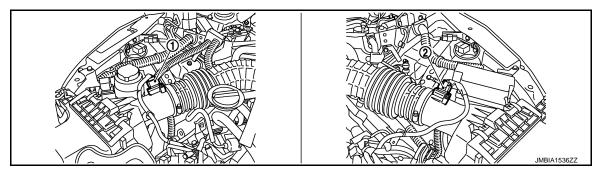
AUTOMATIC SPEED CONTROL DEVICE (ASCD)

[VK50VE] < SYSTEM DESCRIPTION >

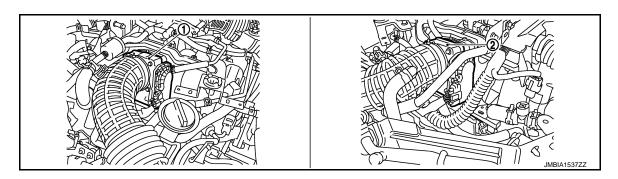
- 31. EVAP canister purge volume control solenoid valve
- 32. Manifold pressure sensor (This sensor is not for controlling the engine system, nor for the on board diagnosis.)
- 33. Knock sensor (bank 2)

- 34. Crankshaft position sensor
- 35. Electric throttle control actuator (bank2)
- 36. VVEL actuator motor (bank 2)
- 37. VVEL control shaft position sensor 38. A/F sensor 1 (bank 2) (bank 2)
- 39. Engine coolant temperature sensor

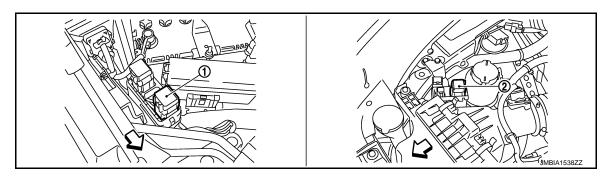
- 40. Fuel injector (bank 2)
- 41. EVAP service port
- 42. Ignition coil (with power transistor) and spark plug (bank 2)



- Mass air flow sensor (bank 2)
- Mass air flow sensor (with intake air 2. temperature sensor) (bank 1)



- Electric throttle control actuator (bank 2)
- 2. Electric throttle control actuator (bank 1)



- Cooling fan relay-1
- 2. Cooling fan relay-2

Vehicle front

EC-635 Revision: 2009 March 2009 FX35/FX50

EC

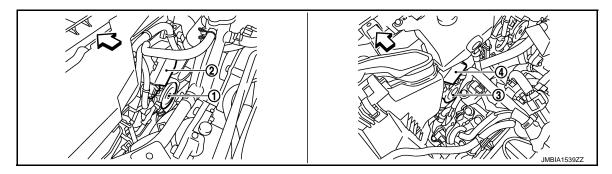
Α

D

Е

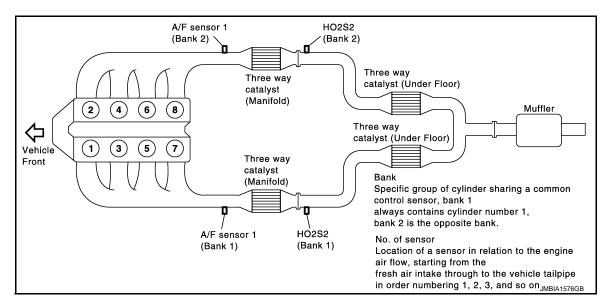
Ν

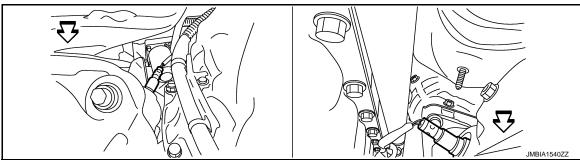
Ρ



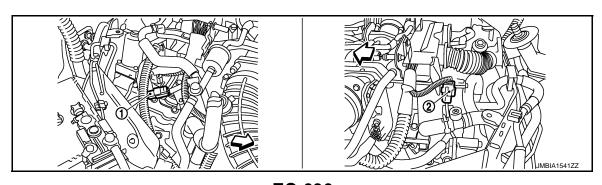
- 1. Cooling fan motor-1
- 2. Cooling fan control module-1
- 3. Cooling fan motor-2

- 4. Cooling fan control module-2
- Vehicle front



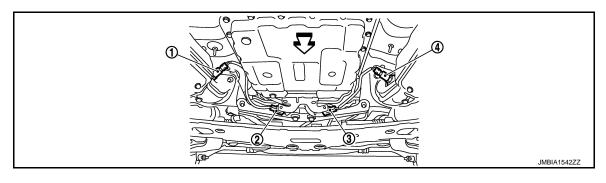


- 1. A/F sensor 1 (bank 1)
- 2. A/F sensor 1 (bank 2)



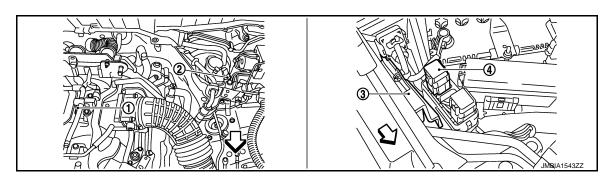
- A/F sensor 1 (bank 2) harness con- 2. nector
- A/F sensor 1 (bank 1) harness connector

⟨ Vehicle front



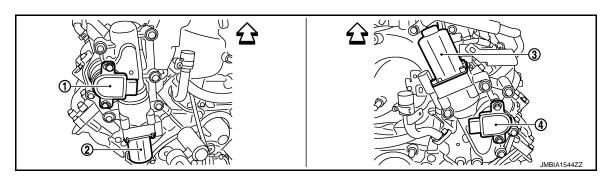
- Heated oxygen sensor 2 (bank 1) 1.
- Heated oxygen sensor 2 (bank 1) harness connector
- Heated oxygen sensor 2 (bank 2) harness connector

- Heated oxygen sensor 2 (bank 2)
- Vehicle front



- Manifold pressure sensor (This sensor is not for controlling the engine system, nor for the on board diagnosis.)
- Brake booster pressure sensor
- VVEL control module

- VVEL actuator motor relay
- ∀ Vehicle front



- VVEL control shaft position sensor (bank 1)
- 2. VVEL actuator motor (bank 1)
- VVEL actuator motor (bank 2)

- VVEL control shaft position sensor (bank 2)
- Vehicle front

EC-637 Revision: 2009 March 2009 FX35/FX50

EC

Α

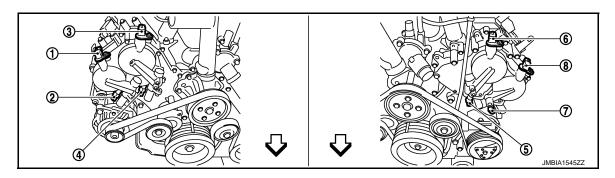
D

Е

F

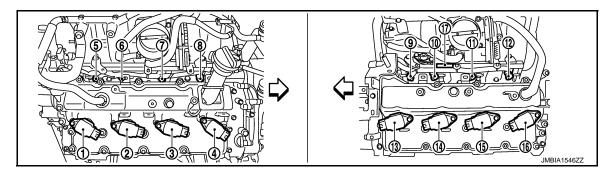
Н

Ν



- Exhaust valve timing control position 2. sensor (bank 2)
- Intake valve timing control solenoid valve (bank 2)
- Exhaust valve timing control solenoid 8. valve (bank 1)
- ∀ Vehicle front

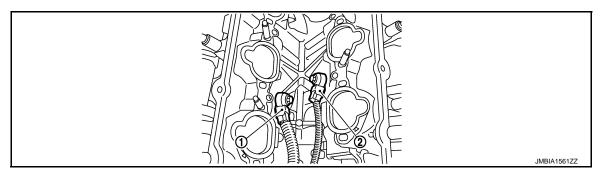
- Exhaust valve timing control solenoid 3. valve (bank 2)
- Intake valve timing control solenoid valve (bank 1)
- Exhaust valve timing control position sensor (bank 1)
- Camshaft position sensor (bank 2)
- Camshaft position sensor (bank 1)



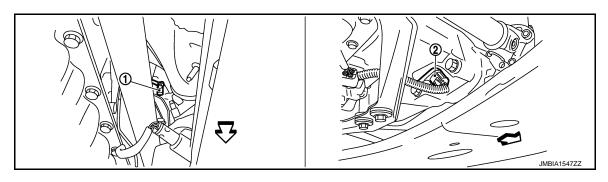
- Ignition coil No.8 (with power transis- 2.
- Ignition coil No.2 (with power transis- 5. 4.
- Fuel injector No.4
- 10. Fuel injector No.3
- 13. Ignition coil No.1 (with power transis- 14. Ignition coil No.3 (with power transis- 15.
- 16. Ignition coil No.7 (with power transis- 17. Condenser
- tor)
- Vehicle front

- Ignition coil No.6 (with power transis- 3. tor)
- Fuel injector No.8
- Fuel injector No.2
- 11. Fuel injector No.5

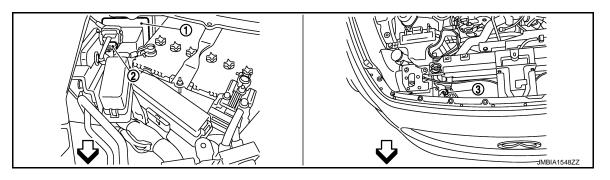
- Ignition coil No.4 (with power transistor)
- Fuel injector No.6
- Fuel injector No.1
- 12. Fuel injector No.7
- Ignition coil No.5 (with power transistor)



- Knock sensor (bank 2)
- Knock sensor (bank 1)

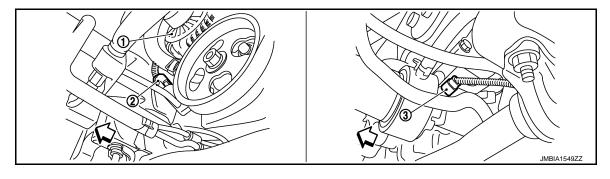


- Engine coolant temperature sensor 2. Crankshaft position sensor
- ∀ Vehicle front



- 1. IPDM E/R
 - Battery current sensor
- Refrigerant pressure sensor

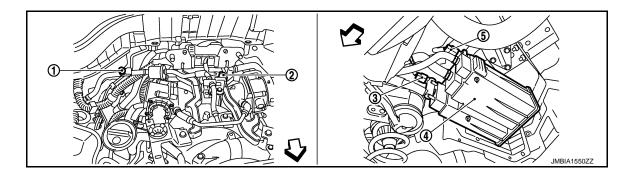
∀ Vehicle front



Alternator

- Power steering pressure sensor
- 3. Engine oil temperature sensor

∀ Vehicle front



EC-639 Revision: 2009 March 2009 FX35/FX50

EC

Α

 D

Е

F

G

Н

M

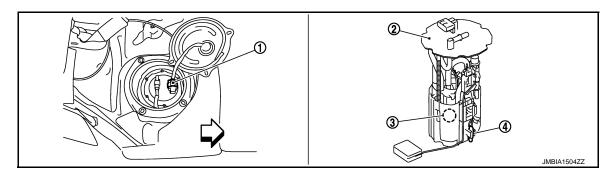
Ν

0

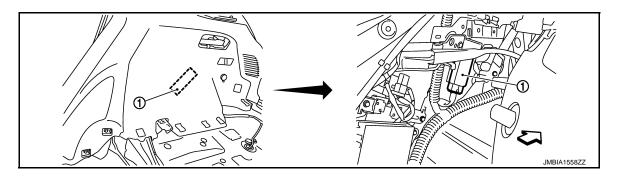
- 1. EVAP service port
- EVAP canister purge volume control 3. EVAP canister vent control valve solenoid valve

4. EVAP canister

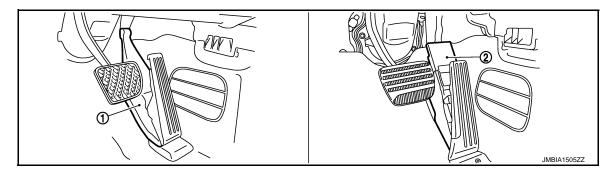
EVAP control system pressure sensor



- Fuel level sensor unit and fuel pump 2. Fuel level sensor unit and fuel pump 3. Fuel pressure regulator harness connector
- 4. Fuel tank temperature sensor
- ∀ Vehicle front



- 1. FPCM



- Accelerator pedal position sensor (without DCA system)
- 2. Accelerator pedal position sensor (with DCA system)

Α

EC

D

Е

F

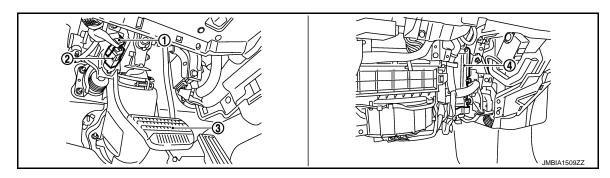
Н

M

Ν

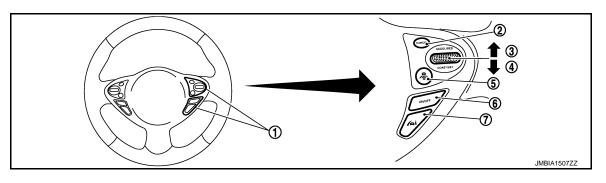
0

Р



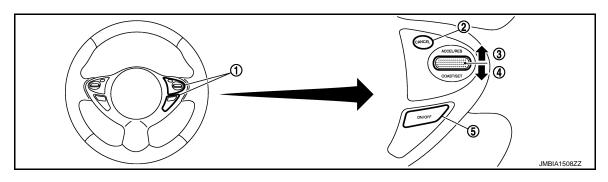
- 1. Stop lamp switch
- 2. ASCD brake switch (ASCD models) 3. ICC brake switch (ICC models)
 - B. Brake pedal

4. ECM



- 1. ICC steering switch
- 4. SET/COAST switch
- 7. LDP switch

- 2. CANCEL switch
- 5. DISTANCE switch
- 3. RESUME/ACCELERATE switch
- 6. MAIN switch



- 1. ASCD steering switch
- CANCEL switch
- 3. RESUME/ACCELERATE switch

- 4. SET/COAST switch
- 5. MAIN switch
- JMBIA1623ZZ

Snow mode switch

AUTOMATIC SPEED CONTROL DEVICE (ASCD)

< SYSTEM DESCRIPTION >

[VK50VE]

Component Description

INFOID:0000000003958653

Component	Reference
ASCD steering switch	EC-1034, "Description"
ASCD brake switch	EC-1041, "Description"
Stop lamp switch	EC-1041, "Description"
Electric throttle control actuator	EC-1012, "Description"
ASCD indicator	EC-1088, "Description"

CAN COMMUNICATION

< SYSTEM DESCRIPTION >

[VK50VE]

CAN COMMUNICATION

System Description

INFOID:0000000003958654

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

Refer to LAN-32, "CAN Communication Signal Chart", about CAN communication for detail.

EC

Α

C

D

Е

F

Н

K

L

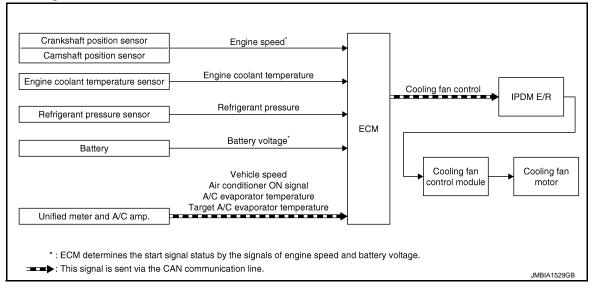
M

Ν

COOLING FAN CONTROL

System Diagram

INFOID:0000000003958655



System Description

INFOID:0000000003958656

INPUT/OUTPUT SIGNAL CHART

Sensor	Input signal to ECM	ECM function	Actuator
Crankshaft position sensor Camshaft position sensor	Engine speed*1	Cooling fan control	IPDM E/R ↓ Cooling fan control module ↓ Cooling fan motor
Engine coolant temperature sensor	Engine coolant temperature		
Refrigerant pressure sensor	Refrigerant pressure		
Battery	Battery voltage*1		
Unified meter and A/C amp.	Vehicle speed*2		
	Air conditioner ON signal*2		
	A/C evaporator temperature*2		
	Target A/C evaporator temperature*2		

^{*1:} The ECM determines the start signal status by the signals of engine speed and battery voltage.

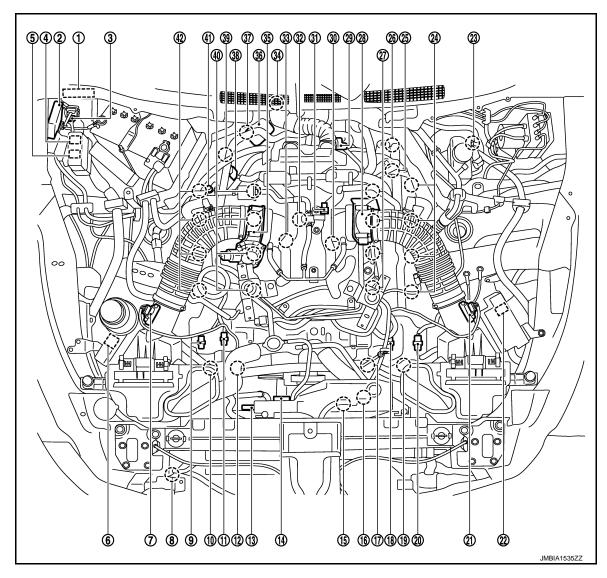
SYSTEM DESCRIPTION

ECM controls cooling fan speed corresponding to vehicle speed, engine coolant temperature, air conditioner ON signal, refrigerant pressure, target A/C evaporator temperature and A/C evaporator temperature. Cooling fan control signal is sent to IPDM E/R from ECM via the CAN communication line. Then, IPDM E/R sends ON/OFF pulse duty signal to cooling fan control module. Corresponding to this ON/OFF pulse duty signal, cooling fan control module gives cooling fan motor operating voltage to cooling fan motors. Cooling fan speed is controlled by duty cycle of cooling fan motor operating voltage sent from cooling fan control module.

^{*2:} This signal is sent to ECM via the CAN communication line.

Component Parts Location

INFOID:0000000003958657



- IPDM E/R
- VVEL actuator motor relay
- 7. Mass air flow sensor (bank 2)
- 10. Exhaust valve timing control solenoid valve (bank 2)
- 13. Cooling fan motor-1
- Cooling fan control module-2
- 19. Exhaust valve timing control solenoid valve (bank 1)
- 22. ICC brake hold relay (ICC models)
- 25. VVEL actuator motor (bank 1)
- 28. Electric throttle control actuator (bank 1)

- VVEL control module
- 5. Cooling fan relay-1
- Refrigerant pressure sensor
- 11. Camshaft position sensor (bank 2)
- 14. Cooling fan control module-1
- 17. Intake valve timing control solenoid valve (bank 1)
- sensor (bank 1)
- 23. Brake booster pressure sensor
- 26. VVEL control shaft position sensor (bank 1)
- 29. A/F sensor 1 (bank 1)

- Battery current sensor
- 6. Cooling fan relay-2
- Exhaust valve timing control position sensor (bank 2)
- Intake valve timing control solenoid valve (bank 2)
- Cooling fan motor-2
- Camshaft position sensor (bank 1) 18.
- 20. Exhaust valve timing control position 21. Mass air flow sensor (with intake air temperature sensor) (bank 1)
 - 24. Ignition coil (with power transistor) and spark plug (bank 1)
 - 27. Fuel injector (bank 1)
 - 30. Knock sensor (bank 1)

EC

Α

D

Е

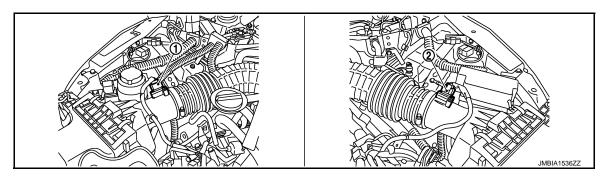
Н

M

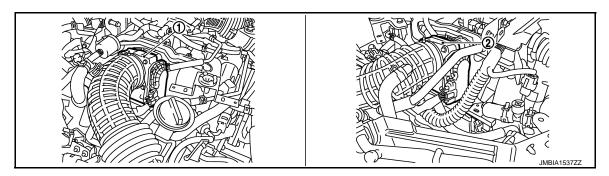
Ν

and spark plug (bank 2)

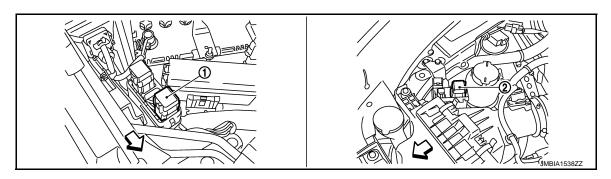
33. Knock sensor (bank 2) 31. EVAP canister purge volume con-32. Manifold pressure sensor (This sensor is not for controlling the trol solenoid valve engine system, nor for the on board diagnosis.) 35. Electric throttle control actuator 36. VVEL actuator motor (bank 2) 34. Crankshaft position sensor (bank2) 37. VVEL control shaft position sensor 38. A/F sensor 1 (bank 2) 39. Engine coolant temperature sensor (bank 2) 40. Fuel injector (bank 2) 41. EVAP service port 42. Ignition coil (with power transistor)



- 1. Mass air flow sensor (bank 2)
- 2. Mass air flow sensor (with intake air temperature sensor) (bank 1)

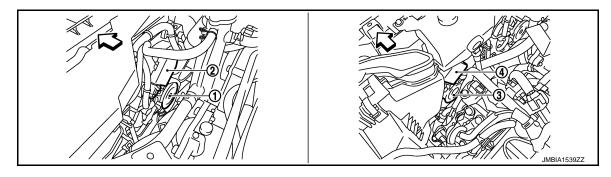


- . Electric throttle control actuator (bank 2)
- 2. Electric throttle control actuator (bank 1)



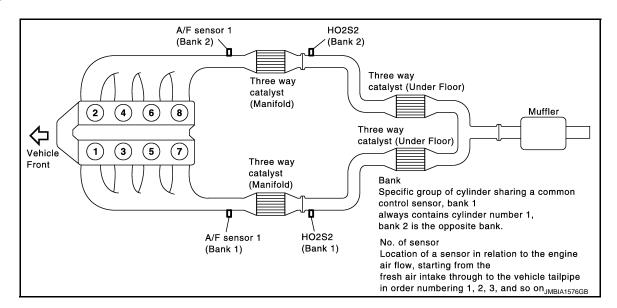
- 1. Cooling fan relay-1

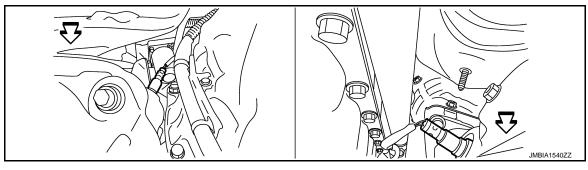
2. Cooling fan relay-2



- 1. Cooling fan motor-1
- 2. Cooling fan control module-1
- 3. Cooling fan motor-2

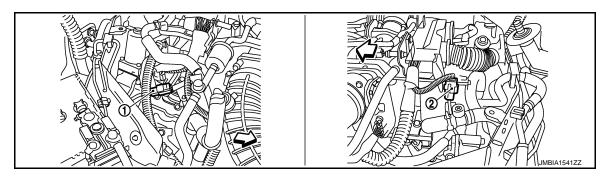
- 4. Cooling fan control module-2
- Vehicle front





- 1. A/F sensor 1 (bank 1)
- 2. A/F sensor 1 (bank 2)

Vehicle front



А

EC

D

Е

Н

M

Ν

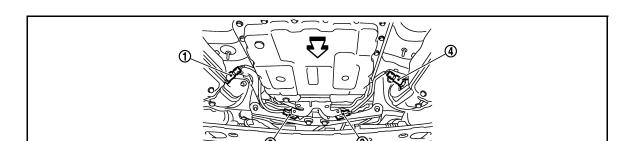
0

Р

Revision: 2009 March EC-647 2009 FX35/FX50

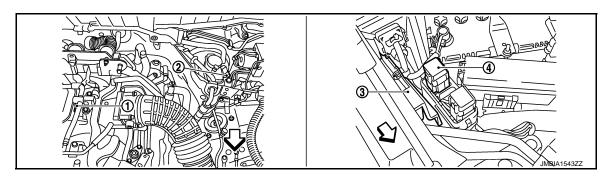
- A/F sensor 1 (bank 2) harness con- 2. nector

A/F sensor 1 (bank 1) harness connector



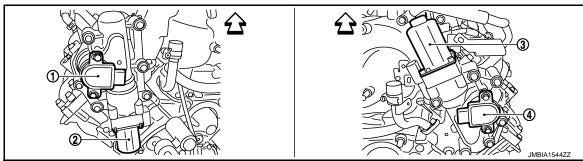
- Heated oxygen sensor 2 (bank 1)
- Heated oxygen sensor 2 (bank 1) harness connector
- Heated oxygen sensor 2 (bank 2) harness connector

- Heated oxygen sensor 2 (bank 2)
- ∀ Vehicle front



- Manifold pressure sensor (This sensor is not for controlling the engine system, nor for the on board diagnosis.)
- Brake booster pressure sensor
- VVEL control module 3.

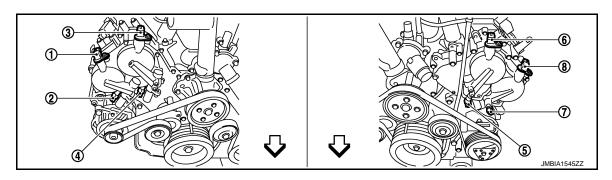
- VVEL actuator motor relay
- ∀ Vehicle front



2. VVEL actuator motor (bank 1)

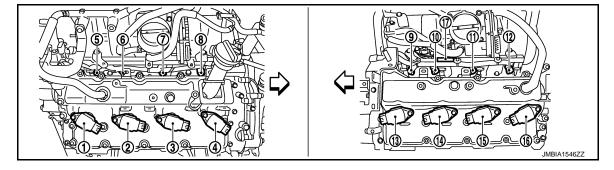
- VVEL control shaft position sensor (bank 1)
- VVEL control shaft position sensor (bank 2)
- ∀ Vehicle front

- - VVEL actuator motor (bank 2)



- Exhaust valve timing control position 2. sensor (bank 2)
- Intake valve timing control solenoid valve (bank 2)
- Exhaust valve timing control solenoid 8. valve (bank 1)
- ∀ Vehicle front

- Exhaust valve timing control solenoid 3. valve (bank 2)
- Intake valve timing control solenoid valve (bank 1)
- Exhaust valve timing control position sensor (bank 1)
- Camshaft position sensor (bank 2)
- Camshaft position sensor (bank 1)

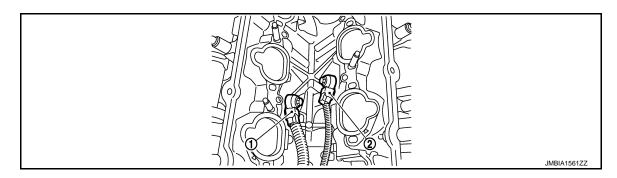


- Ignition coil No.8 (with power transis- 2.
- Ignition coil No.2 (with power transis- 5. 4. tor)
- 7. Fuel injector No.4
- 10. Fuel injector No.3
- 13. Ignition coil No.1 (with power transis- 14.
- 16. Ignition coil No.7 (with power transis- 17. Condenser tor)

- Ignition coil No.6 (with power transis- 3.
- Fuel injector No.8
- Fuel injector No.2
- 11. Fuel injector No.5
- Ignition coil No.3 (with power transis- 15.

- Ignition coil No.4 (with power transistor)
- Fuel injector No.6
- 9. Fuel injector No.1
- 12. Fuel injector No.7
- Ignition coil No.5 (with power transistor)

∀ Vehicle front



Knock sensor (bank 2)

Knock sensor (bank 1)

EC-649 Revision: 2009 March 2009 FX35/FX50

Α

EC

D

Е

F

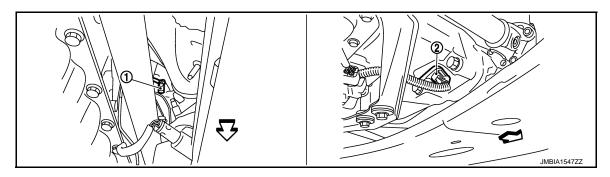
Н

K

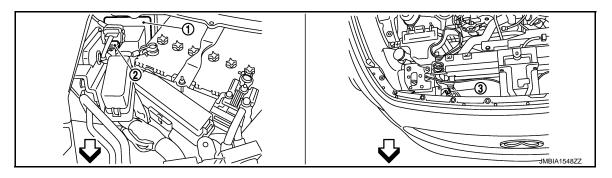
M

Ν

Ρ



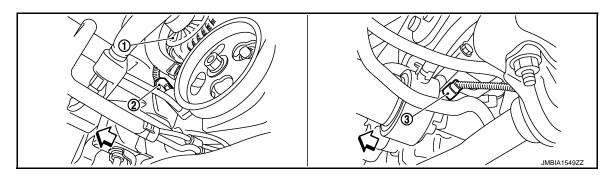
- . Engine coolant temperature sensor 2. Crankshaft position sensor
- ∀ Vehicle front



1. IPDM E/R

- 2. Battery current sensor
- 3. Refrigerant pressure sensor

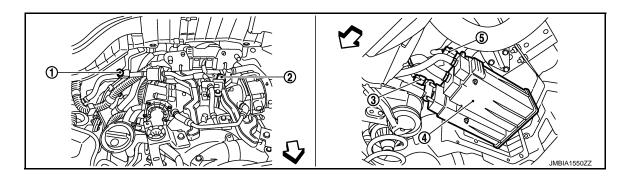
∀ Vehicle front



1. Alternator

- 2. Power steering pressure sensor
- 3. Engine oil temperature sensor



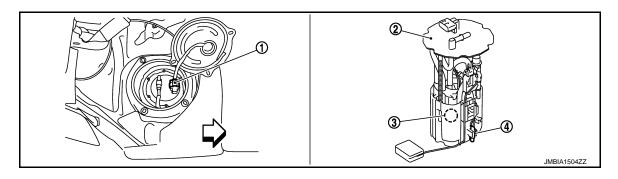


- EVAP service port
- EVAP canister purge volume control 3. EVAP canister vent control valve solenoid valve

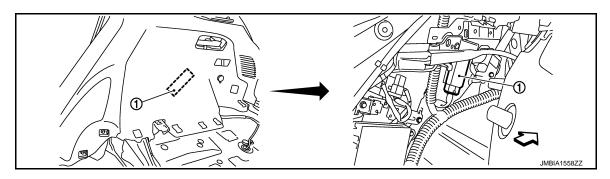
4. EVAP canister

5. EVAP control system pressure sensor

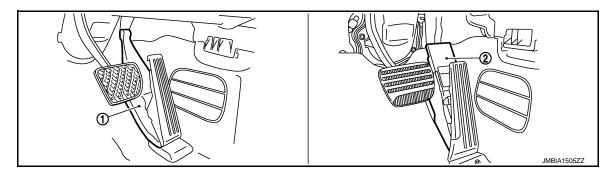
Vehicle front



- Fuel level sensor unit and fuel pump 2. Fuel level sensor unit and fuel pump 3. Fuel pressure regulator harness connector
- 4. Fuel tank temperature sensor
- ∀ Vehicle front



- 1. FPCM



- Accelerator pedal position sensor (without DCA system)
- Accelerator pedal position sensor (with DCA system)

EC

Α

D

Е

F

G

Н

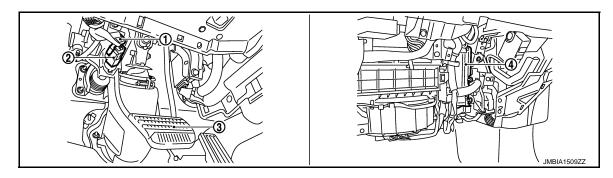
J

 \mathbb{N}

Ν

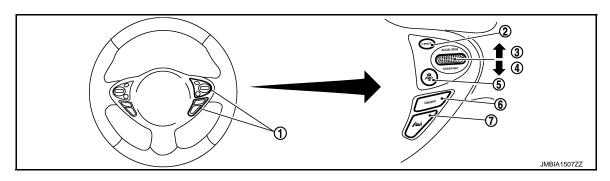
0

Revision: 2009 March **EC-651** 2009 FX35/FX50



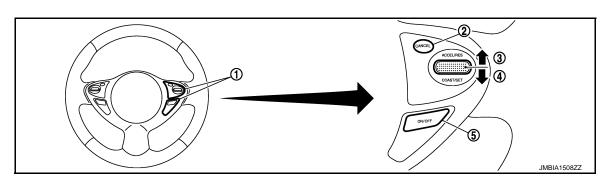
- Stop lamp switch
- 2. ASCD brake switch (ASCD models) 3. ICC brake switch (ICC models)
 - Brake pedal

4. ECM



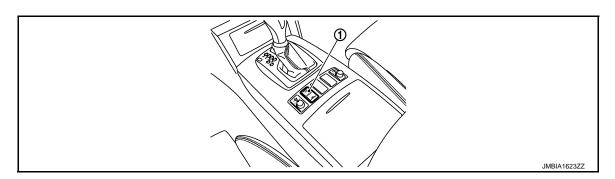
- 1. ICC steering switch
- 4. SET/COAST switch
- 7. LDP switch

- 2. CANCEL switch
- 5. DISTANCE switch
- 3. RESUME/ACCELERATE switch
- 6. MAIN switch



- ASCD steering switch
 SET/COAST switch
- 2. CANCEL switch
- 5. MAIN switch

RESUME/ACCELERATE switch



1. Snow mode switch

COOLING FAN CONTROL

< SYSTEM DESCRIPTION >

[VK50VE]

Component Description

INFOID:0000000003958658

Component	Reference
Camshaft position sensor	EC-871, "Description"
Crankshaft position sensor	EC-867, "Description"
Cooling fan control module	EC-1089. "Description"
Cooling fan motor	EC-1089. "Description"
Engine coolant temperature sensor	EC-784, "Description"
Refrigerant pressure sensor	EC-1122, "Description"

EC

Α

D

Е

F

G

Н

1

K

 $oxedsymbol{oxed}$

 \mathbb{N}

Ν

0

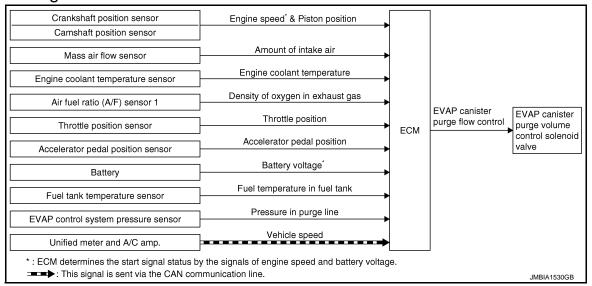
Ρ

[VK50VE]

EVAPORATIVE EMISSION SYSTEM

System Diagram

INFOID:0000000003958659



System Description

INFOID:0000000003958660

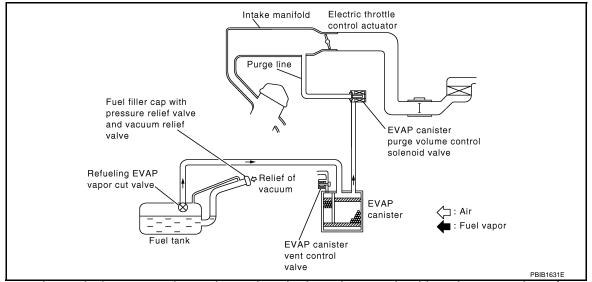
INPUT/OUTPUT SIGNAL CHART

Sensor	Input signal to ECM	ECM function	Actuator
Crankshaft position sensor Camshaft position sensor	Engine speed*1		EVAP canister purge volume
Mass air flow sensor	Amount of intake air		
Engine coolant temperature sensor	Engine coolant temperature		
Battery	Battery voltage*1		
Throttle position sensor	Throttle position		
Accelerator pedal position sensor	Accelerator pedal position		control solenoid valve
Air fuel ratio (A/F) sensor 1	Density of oxygen in exhaust gas (Mixture ratio feedback signal)		
Fuel tank temperature sensor	Fuel temperature in fuel tank		
EVAP control system pressure sensor	Pressure in purge line		
Unified meter and A/C amp.	Vehicle speed*2		

^{*1:} ECM determines the start signal status by the signals of engine speed and battery voltage.

^{*2:} This signal is sent to the ECM via the CAN communication line.

SYSTEM DESCRIPTION



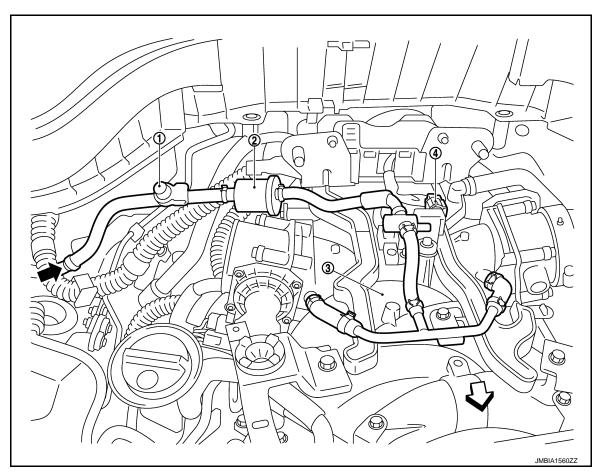
The evaporative emission system is used to reduce hydrocarbons emitted into the atmosphere from the fuel system. This reduction of hydrocarbons is accomplished by activated charcoals in the EVAP canister.

The fuel vapor in the sealed fuel tank is led into the EVAP canister which contains activated carbon and the vapor is stored there when the engine is not operating or when refueling to the fuel tank.

The vapor in the EVAP canister is purged by the air through the purge line to the intake manifold when the engine is operating. EVAP canister purge volume control solenoid valve is controlled by ECM. When the engine operates, the flow rate of vapor controlled by EVAP canister purge volume control solenoid valve is proportionally regulated as the air flow increases.

EVAP canister purge volume control solenoid valve also shuts off the vapor purge line during decelerating and idling.

EVAPORATIVE EMISSION LINE DRAWING



EC-655 Revision: 2009 March 2009 FX35/FX50

EC

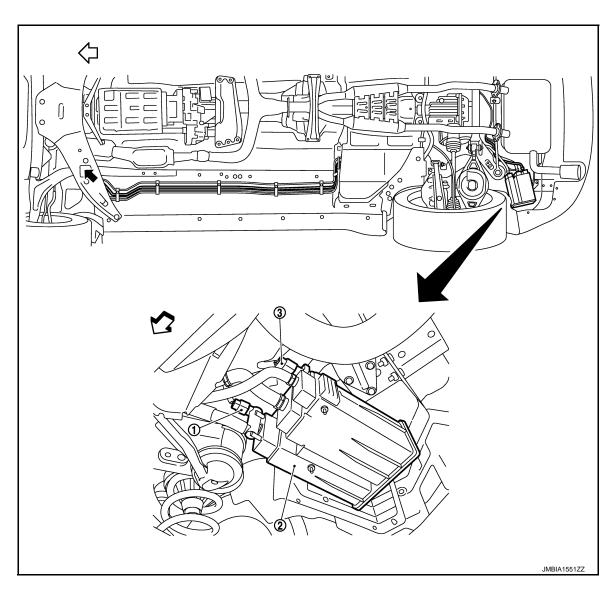
Α

D

Ν

- 1. EVAP service port
- 2. EVAP purge resonator
- 3. Intake manifold collector

- 4. EVAP canister purge volume control solenoid valve
- ∵ : Vehicle front
- =: From next figure



- 1. EVAP canister vent control valve
- 2. EVAP canister

3. EVAP control system pressure sensor

- : Vehicle front
- = : To previous figure

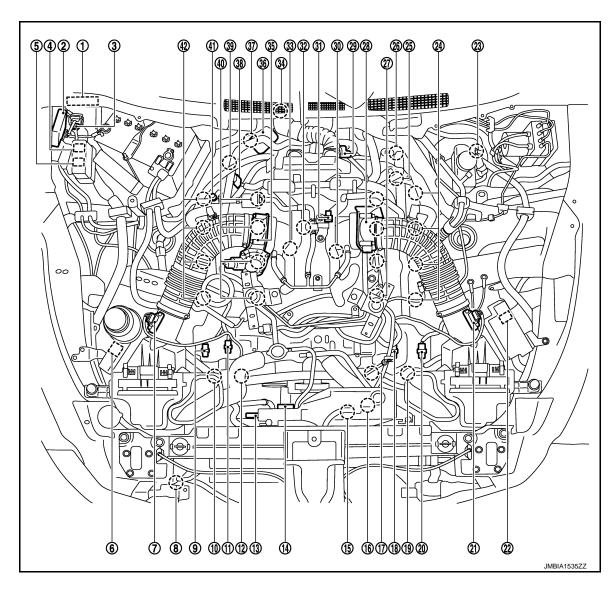
NOTE:

Do not use soapy water or any type of solvent while installing vacuum hose or purge hoses.

[VK50VE]

Component Parts Location

INFOID:0000000003958661



- IPDM E/R
- VVEL actuator motor relay
- 7. Mass air flow sensor (bank 2)
- 10. Exhaust valve timing control solenoid valve (bank 2)
- 13. Cooling fan motor-1
- Cooling fan control module-2
- 19. Exhaust valve timing control solenoid valve (bank 1)
- 22. ICC brake hold relay (ICC models)
- 25. VVEL actuator motor (bank 1)
- 28. Electric throttle control actuator (bank 1)

- VVEL control module
- 5. Cooling fan relay-1
- Refrigerant pressure sensor
- 11. Camshaft position sensor (bank 2)
- 14. Cooling fan control module-1
- 17. Intake valve timing control solenoid valve (bank 1)
- 20. Exhaust valve timing control position 21. sensor (bank 1)
- 23. Brake booster pressure sensor
- 26. VVEL control shaft position sensor (bank 1)
- 29. A/F sensor 1 (bank 1)

- Battery current sensor
- 6. Cooling fan relay-2
- Exhaust valve timing control position sensor (bank 2)
- Intake valve timing control solenoid valve (bank 2)
- Cooling fan motor-2 15.
- Camshaft position sensor (bank 1) 18.
- Mass air flow sensor (with intake air temperature sensor) (bank 1)
- 24. Ignition coil (with power transistor) and spark plug (bank 1)
- 27. Fuel injector (bank 1)
- 30. Knock sensor (bank 1)

EC

Α

D

Е

Н

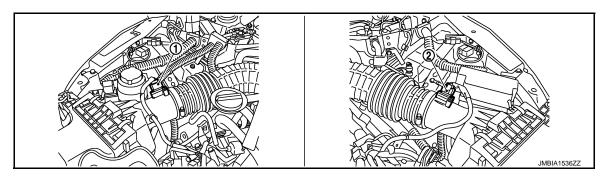
M

Ν

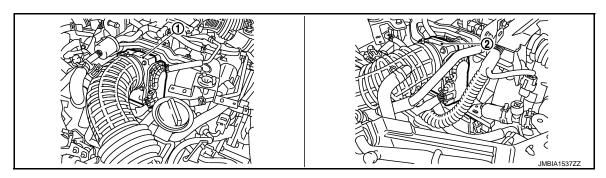
Ρ

and spark plug (bank 2)

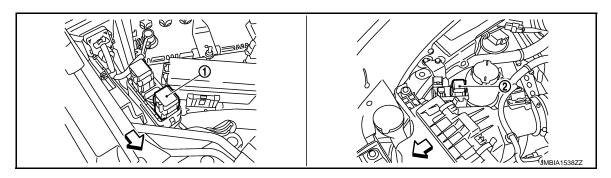
33. Knock sensor (bank 2) 31. EVAP canister purge volume con-32. Manifold pressure sensor (This sensor is not for controlling the trol solenoid valve engine system, nor for the on board diagnosis.) 35. Electric throttle control actuator 36. VVEL actuator motor (bank 2) 34. Crankshaft position sensor (bank2) 37. VVEL control shaft position sensor 38. A/F sensor 1 (bank 2) 39. Engine coolant temperature sensor (bank 2) 40. Fuel injector (bank 2) 41. EVAP service port 42. Ignition coil (with power transistor)



- 1. Mass air flow sensor (bank 2)
- 2. Mass air flow sensor (with intake air temperature sensor) (bank 1)

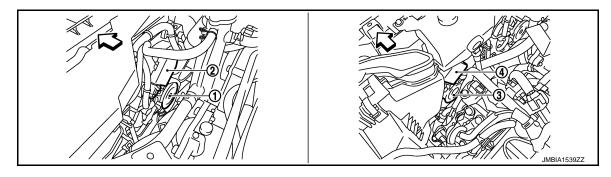


- . Electric throttle control actuator (bank 2)
- 2. Electric throttle control actuator (bank 1)



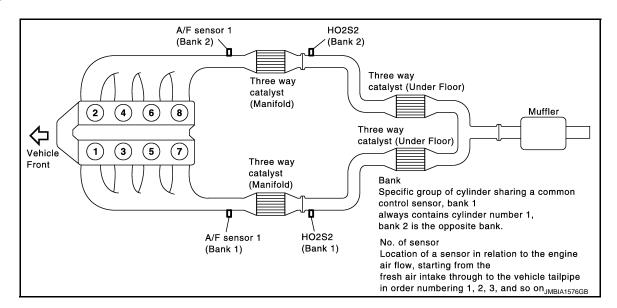
- 1. Cooling fan relay-1
- ⟨□ Vehicle front

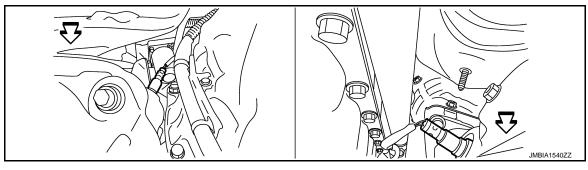
2. Cooling fan relay-2



- 1. Cooling fan motor-1
- 2. Cooling fan control module-1
- 3. Cooling fan motor-2

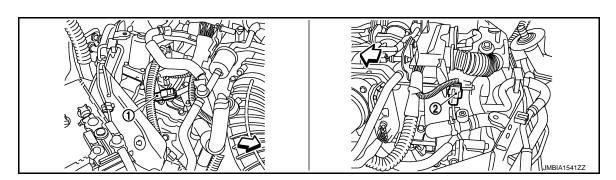
- 4. Cooling fan control module-2
- Vehicle front





- 1. A/F sensor 1 (bank 1)
- 2. A/F sensor 1 (bank 2)

Vehicle front



EC

Α

D

Е

F

G

Н

J

r\

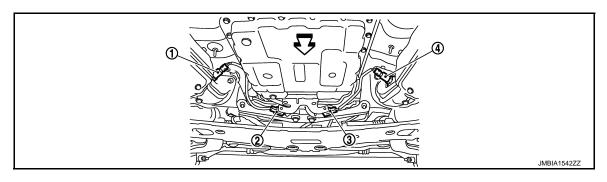
M

Ν

 \cap

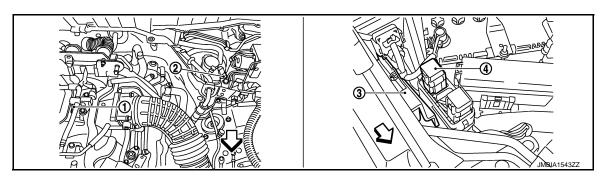
- A/F sensor 1 (bank 2) harness con- 2. nector
- 2. A/F sensor 1 (bank 1) harness connector

⟨
→ Vehicle front



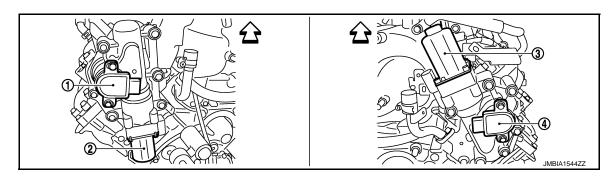
- 1. Heated oxygen sensor 2 (bank 1)
- Heated oxygen sensor 2 (bank 1) harness connector
- Heated oxygen sensor 2 (bank 2) harness connector

- 4. Heated oxygen sensor 2 (bank 2)
- Vehicle front



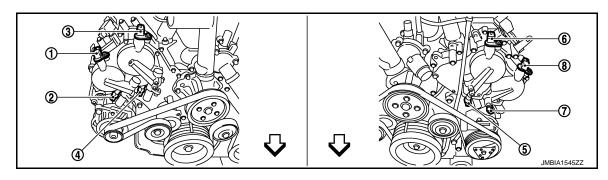
- Manifold pressure sensor (This sensor is not for controlling the engine system, nor for the on board diagnosis.)
- 2. Brake booster pressure sensor
- 3. VVEL control module

- 4. VVEL actuator motor relay
- ∀ Vehicle front



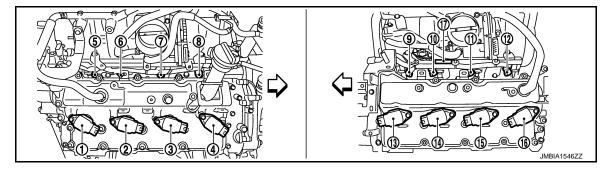
- VVEL control shaft position sensor (bank 1)
- 2. VVEL actuator motor (bank 1)
- 3. VVEL actuator motor (bank 2)

- 4. VVEL control shaft position sensor (bank 2)
- Vehicle front



- Exhaust valve timing control position 2. sensor (bank 2)
- Intake valve timing control solenoid valve (bank 2)
- Exhaust valve timing control solenoid 8. valve (bank 1)
- ∀ Vehicle front

- Exhaust valve timing control solenoid 3. valve (bank 2)
- Intake valve timing control solenoid valve (bank 1)
- Exhaust valve timing control position sensor (bank 1)
- Camshaft position sensor (bank 2)
- Camshaft position sensor (bank 1)



- Ignition coil No.8 (with power transis- 2.
- Ignition coil No.2 (with power transis- 5. tor)
- 7. Fuel injector No.4
- 10. Fuel injector No.3
- 13. Ignition coil No.1 (with power transis- 14.
- 16. Ignition coil No.7 (with power transis- 17. Condenser
- tor)

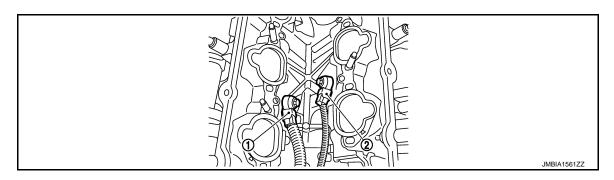
Fuel injector No.8

Fuel injector No.2

11. Fuel injector No.5

- Ignition coil No.3 (with power transis- 15.
- Ignition coil No.6 (with power transis- 3. Ignition coil No.4 (with power transistor)
 - Fuel injector No.6
 - 9. Fuel injector No.1
 - 12. Fuel injector No.7
 - Ignition coil No.5 (with power transistor)

∀ Vehicle front



Knock sensor (bank 2)

Knock sensor (bank 1)

EC-661 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

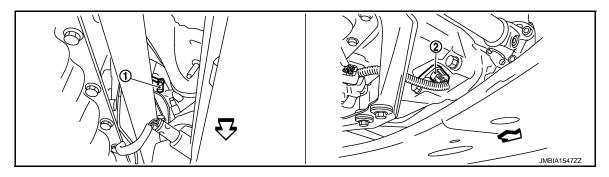
F

Н

K

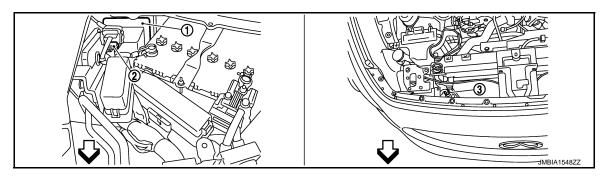
M

Ν



- Engine coolant temperature sensor 2. Crankshaft position sensor

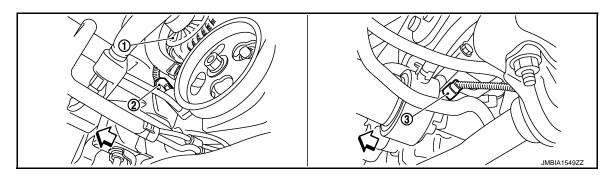
∀ Vehicle front



IPDM E/R

- Battery current sensor
- Refrigerant pressure sensor

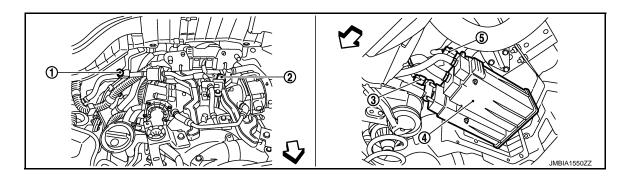
∀ Vehicle front



Alternator

- Power steering pressure sensor
- 3. Engine oil temperature sensor

∀ Vehicle front



EVAPORATIVE EMISSION SYSTEM

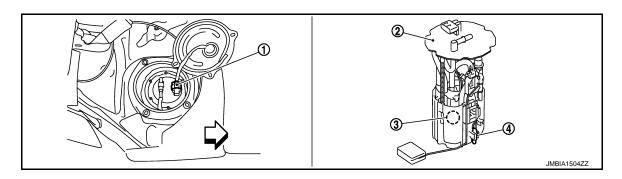
< SYSTEM DESCRIPTION > [VK50VE]

- EVAP service port
- EVAP canister purge volume control 3. EVAP canister vent control valve solenoid valve

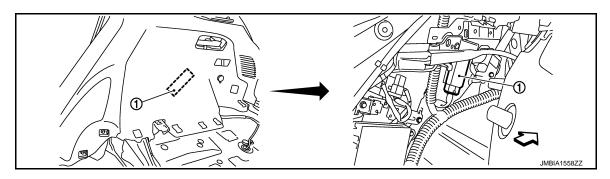
4. EVAP canister

EVAP control system pressure sensor

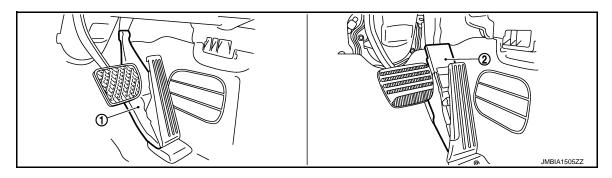
Vehicle front



- Fuel level sensor unit and fuel pump 2. Fuel level sensor unit and fuel pump 3. Fuel pressure regulator harness connector
- 4. Fuel tank temperature sensor
- ∀ Vehicle front



- 1. FPCM



- Accelerator pedal position sensor (without DCA system)
- Accelerator pedal position sensor (with DCA system)

EC

Α

D

Е

F

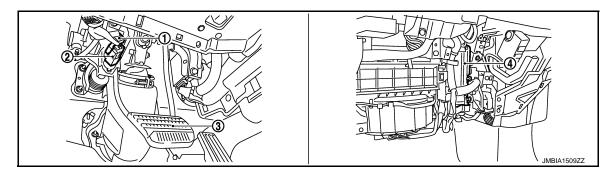
G

Н

M

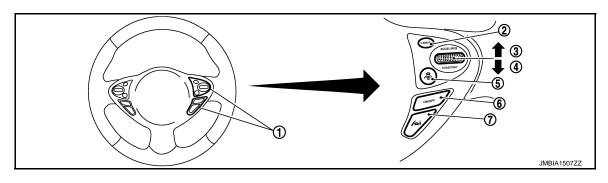
Ν

0



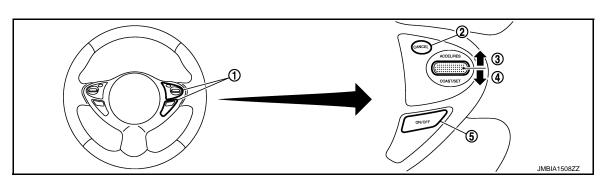
- Stop lamp switch
- 2. ASCD brake switch (ASCD models) 3. ICC brake switch (ICC models)
 - Brake pedal

4. ECM



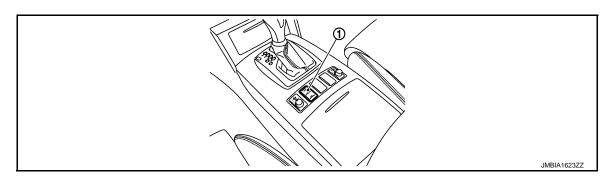
- 1. ICC steering switch
- 4. SET/COAST switch
- 7. LDP switch

- 2. CANCEL switch
- 5. DISTANCE switch
- 3. RESUME/ACCELERATE switch
- 6. MAIN switch



- 1. ASCD steering switch
- . SET/COAST switch
- 2. CANCEL switch
- 5. MAIN switch

RESUME/ACCELERATE switch



1. Snow mode switch

EVAPORATIVE EMISSION SYSTEM

< SYSTEM DESCRIPTION >

[VK50VE]

Component Description

INFOID:0000000003958662

Component	Reference
A/F sensor 1	EC-799, "Description"
Accelerator pedal position sensor	EC-1067, "Description"
Camshaft position sensor	EC-871, "Description"
Crankshaft position sensor	EC-867, "Description"
Engine coolant temperature sensor	EC-784, "Description"
EVAP canister purge volume control solenoid valve	EC-893, "Description"
EVAP control system pressure sensor	EC-909, "Description"
Fuel tank temperature sensor	EC-842, "Description"
Mass air flow sensor	EC-768, "Description"
Throttle position sensor	EC-789, "Description"

F

D

Е

Α

EC

G

Н

-

Κ

L

M

Ν

0

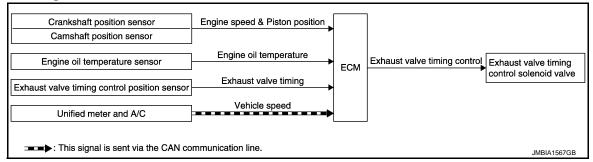
Ρ

[VK50VE]

EXHAUST VALVE TIMING CONTROL

System Diagram

INFOID:0000000003958663



System Description

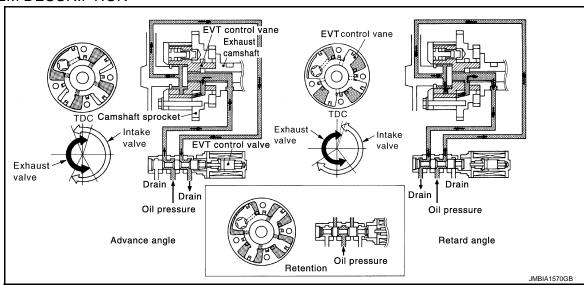
INFOID:0000000003958664

INPUT/OUTPUT SIGNAL CHART

Sensor	Input signal to ECM	ECM function	Actuator
Crankshaft position sensor	Engine speed and piston position		
Camshaft position sensor	- Lingine speed and piston position		
Engine oil temperature sensor	Engine oil temperature Exhaust valve timing control	Exhaust valve timing control solenoid valve	
Exhaust valve timing control position sensor	Exhaust valve timing signal		
Unified meter and A/C amp.	Vehicle speed*		

^{*:} This signal is sent to the ECM via the CAN Communication line

SYSTEM DESCRIPTION

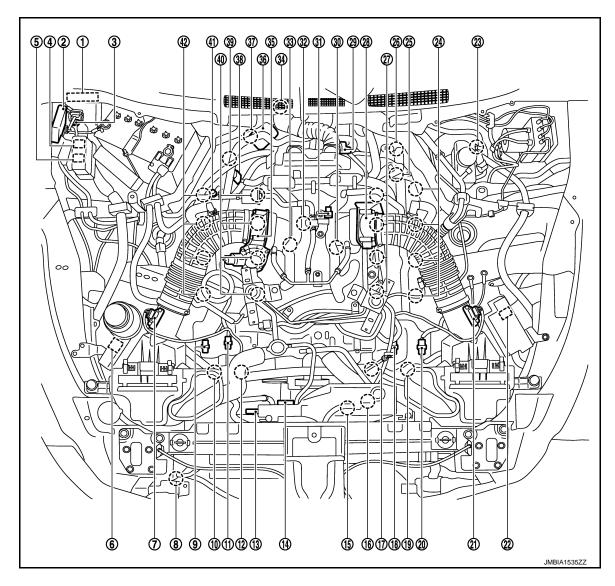


This mechanism hydraulically controls cam phases continuously with the fixed operating angle of the exhaust valve.

The ECM receives signals such as crankshaft position, camshaft position, engine speed, and engine oil temperature. Then, the ECM sends ON/OFF pulse duty signals to the exhaust valve timing control solenoid valve depending on driving status. This makes it possible to control the shut/open timing of the exhaust valve to increase engine torque and output in a range of high engine speed.

Component Parts Location

INFOID:0000000003958665



- IPDM E/R
- VVEL actuator motor relay
- 7. Mass air flow sensor (bank 2)
- 10. Exhaust valve timing control solenoid valve (bank 2)
- 13. Cooling fan motor-1
- Cooling fan control module-2
- 19. Exhaust valve timing control solenoid valve (bank 1)
- 22. ICC brake hold relay (ICC models)
- 25. VVEL actuator motor (bank 1)
- 28. Electric throttle control actuator (bank 1)

- VVEL control module
- 5. Cooling fan relay-1
- Refrigerant pressure sensor
- 11. Camshaft position sensor (bank 2)
- 14. Cooling fan control module-1
- 17. Intake valve timing control solenoid valve (bank 1)
- sensor (bank 1)
- 23. Brake booster pressure sensor
- 26. VVEL control shaft position sensor (bank 1)
- 29. A/F sensor 1 (bank 1)

- Battery current sensor
- 6. Cooling fan relay-2
- Exhaust valve timing control position sensor (bank 2)
- Intake valve timing control solenoid valve (bank 2)
- Cooling fan motor-2 15.
- Camshaft position sensor (bank 1) 18.
- 20. Exhaust valve timing control position 21. Mass air flow sensor (with intake air temperature sensor) (bank 1)
 - 24. Ignition coil (with power transistor) and spark plug (bank 1)
 - 27. Fuel injector (bank 1)
 - 30. Knock sensor (bank 1)

EC

Α

D

Е

Н

M

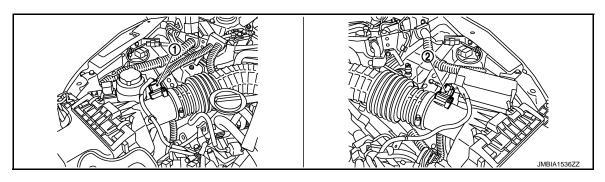
Ν

< SYSTEM DESCRIPTION >

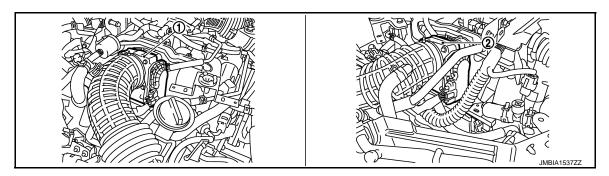
- 31. EVAP canister purge volume control solenoid valve
- 32. Manifold pressure sensor (This sensor is not for controlling the engine system, nor for the on board diagnosis.)
- 33. Knock sensor (bank 2)

- 34. Crankshaft position sensor
- 35. Electric throttle control actuator (bank2)
- 36. VVEL actuator motor (bank 2)
- 37. VVEL control shaft position sensor 38. A/F sensor 1 (bank 2)
 - (bank 2)
- 40. Fuel injector (bank 2) 41. EVAP service port
- 42. Ignition coil (with power transistor) and spark plug (bank 2)

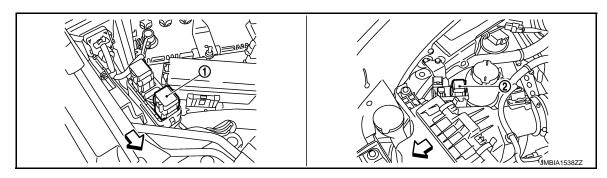
39. Engine coolant temperature sensor



- Mass air flow sensor (bank 2)
- 2. Mass air flow sensor (with intake air temperature sensor) (bank 1)

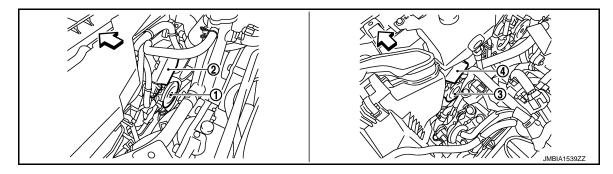


- Electric throttle control actuator (bank 2)
- Electric throttle control actuator (bank 1)



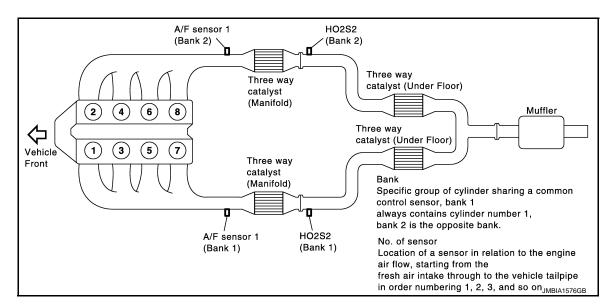
- Cooling fan relay-1
- ⟨□ Vehicle front

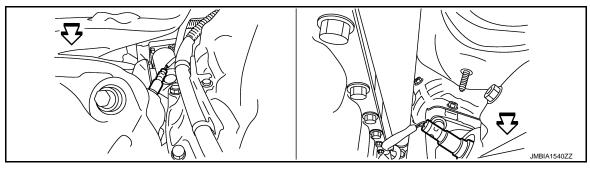
2. Cooling fan relay-2



- 1. Cooling fan motor-1
- 2. Cooling fan control module-1
- 3. Cooling fan motor-2

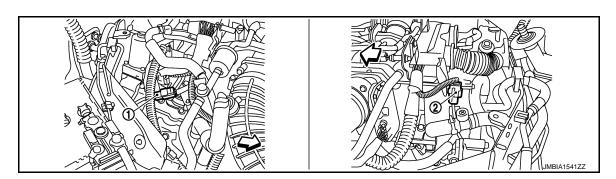
- 4. Cooling fan control module-2
- Vehicle front





- 1. A/F sensor 1 (bank 1)
- 2. A/F sensor 1 (bank 2)

Vehicle front



Α

EC

D

Е

F

G

Н

J

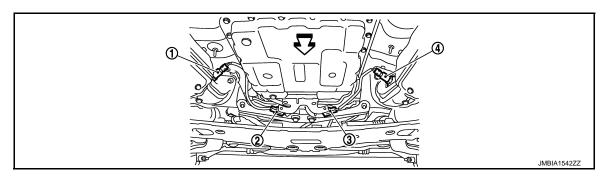
n

Ν

0

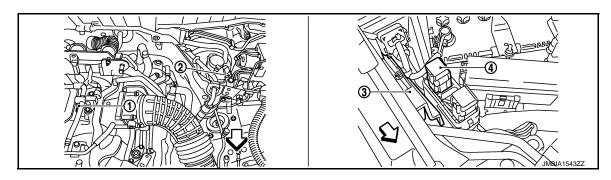
- A/F sensor 1 (bank 2) harness con- 2. nector
- A/F sensor 1 (bank 1) harness connector

⟨
→ Vehicle front



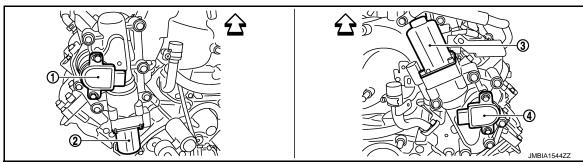
- Heated oxygen sensor 2 (bank 1)
- Heated oxygen sensor 2 (bank 1) harness connector
- Heated oxygen sensor 2 (bank 2) harness connector

- Heated oxygen sensor 2 (bank 2)
- Vehicle front



- Manifold pressure sensor (This sensor is not for controlling the engine system, nor for the on board diagnosis.)
- Brake booster pressure sensor
- VVEL control module

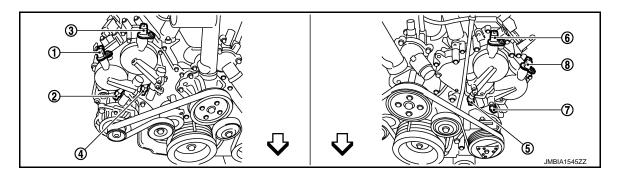
- VVEL actuator motor relay
- ∀ Vehicle front



2. VVEL actuator motor (bank 1)

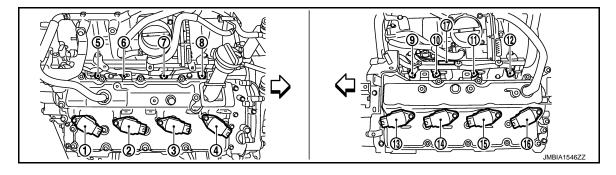
- VVEL control shaft position sensor (bank 1)
- VVEL control shaft position sensor (bank 2)
- ∀ Vehicle front

- - VVEL actuator motor (bank 2)



- Exhaust valve timing control position 2. sensor (bank 2)
- Intake valve timing control solenoid valve (bank 2)
- Exhaust valve timing control solenoid 8. valve (bank 1)
- ∀ Vehicle front

- Exhaust valve timing control solenoid 3. valve (bank 2)
 - Intake valve timing control solenoid valve (bank 1)
- Exhaust valve timing control position sensor (bank 1)
- Camshaft position sensor (bank 2)
- Camshaft position sensor (bank 1)

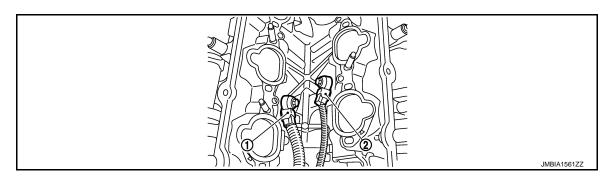


- Ignition coil No.8 (with power transis- 2.
- Ignition coil No.2 (with power transis- 5. tor)
- 7. Fuel injector No.4
- 10. Fuel injector No.3
- 13. Ignition coil No.1 (with power transis- 14. Ignition coil No.3 (with power transis- 15.
- 16. Ignition coil No.7 (with power transis- 17. Condenser tor)

- Ignition coil No.6 (with power transis- 3.
- Fuel injector No.8
- Fuel injector No.2
- 11. Fuel injector No.5

- Ignition coil No.4 (with power transistor)
- Fuel injector No.6
- 9. Fuel injector No.1
- 12. Fuel injector No.7
 - Ignition coil No.5 (with power transistor)

∀ Vehicle front



- Knock sensor (bank 2)
- Knock sensor (bank 1)

EC-671 Revision: 2009 March 2009 FX35/FX50

Α

EC

D

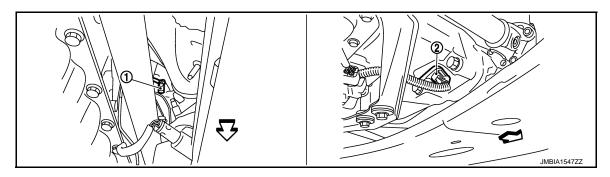
Е

F

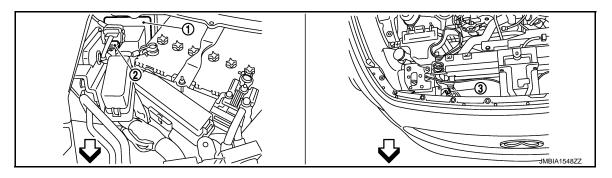
K

M

Ν



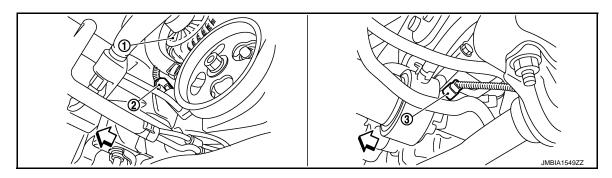
- 1. Engine coolant temperature sensor 2. Crankshaft position sensor
- ∀ Vehicle front



1. IPDM E/R

- 2. Battery current sensor
- 3. Refrigerant pressure sensor

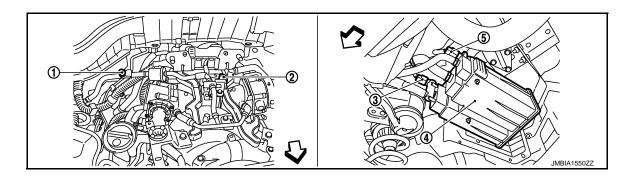
∀ Vehicle front



1. Alternator

- 2. Power steering pressure sensor
- 3. Engine oil temperature sensor

∀ Vehicle front



EXHAUST VALVE TIMING CONTROL

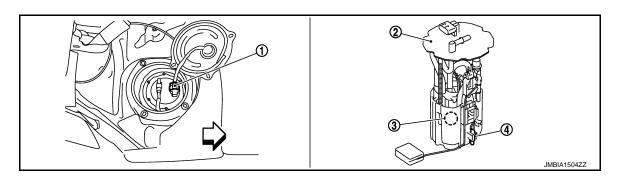
< SYSTEM DESCRIPTION > [VK50VE]

- EVAP service port
- EVAP canister purge volume control 3. EVAP canister vent control valve solenoid valve

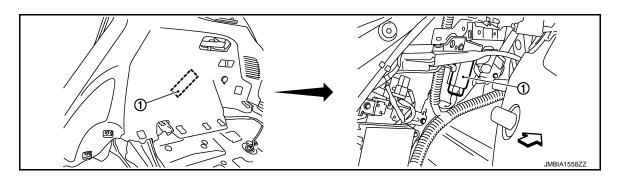
4. EVAP canister

5. EVAP control system pressure sensor

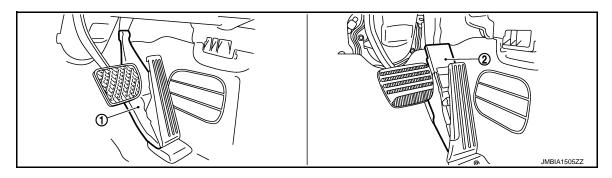
Vehicle front



- Fuel level sensor unit and fuel pump 2. Fuel level sensor unit and fuel pump 3. Fuel pressure regulator harness connector
- 4. Fuel tank temperature sensor
- ∀ Vehicle front



- 1. FPCM



- Accelerator pedal position sensor (without DCA system)
- Accelerator pedal position sensor (with DCA system)

EC

Α

D

Е

-

G

Н

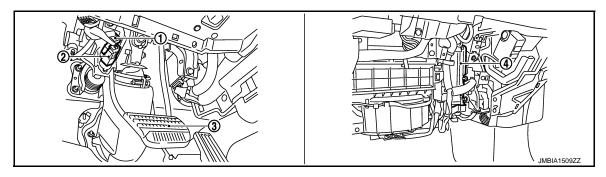
.

ı

M

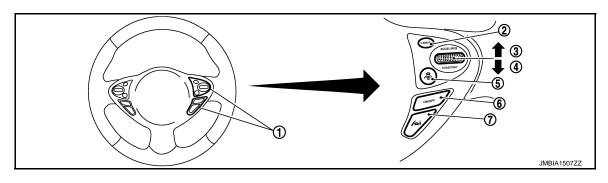
Ν

0



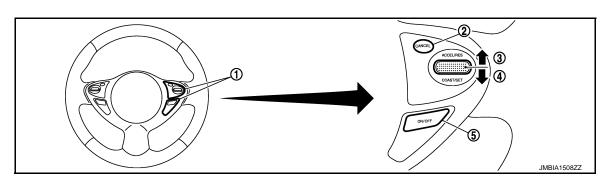
- Stop lamp switch
- 2. ASCD brake switch (ASCD models) 3. ICC brake switch (ICC models)
 - Brake pedal

4. ECM



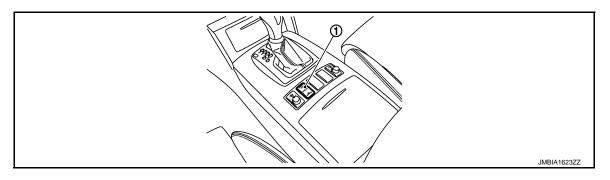
- 1. ICC steering switch
- 4. SET/COAST switch
- 7. LDP switch

- 2. CANCEL switch
- 5. DISTANCE switch
- 3. RESUME/ACCELERATE switch
- 6. MAIN switch



- ASCD steering switch
- 4. SET/COAST switch
- 2. CANCEL switch
- 5. MAIN switch

3. RESUME/ACCELERATE switch



1. Snow mode switch

EXHAUST VALVE TIMING CONTROL

< SYSTEM DESCRIPTION >

[VK50VE]

Component Description

INFOID:0000000003958666

Component	Reference	
Camshaft position sensor	EC-871, "Description"	
Crankshaft position sensor	EC-867, "Description"	
Engine oil temperature sensor	EC-848, "Description"	
Exhaust valve timing control position sensor	EC-969, "Description"	
Exhaust valve timing control solenoid valve	EC-765, "Description"	

EC

Α

D

Е

F

G

Н

1

K

M

L

Ν

0

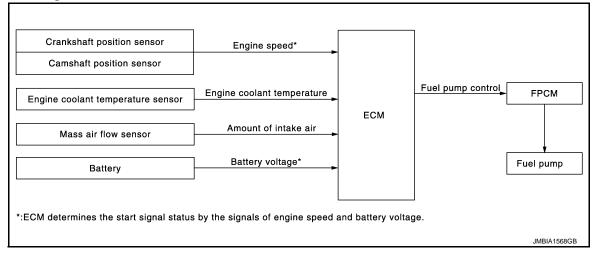
Ρ

[VK50VE]

FUEL PUMP CONTROL MODULE

System Diagram

INFOID:0000000003977710



System Description

INFOID:0000000003977711

INPUT/OUTPUT SIGNAL CHART

Sensor	Input signal to ECM	ECM function	Actuator
Crankshaft position sensor Camshaft position sensor	Engine speed*		FPCM
Engine coolant temperature sensor	Engine coolant temperature	Fuel pump control	↓ ↓
Mass air flow sensor	Amount of intake air		Fuel pump
Battery	Battery voltage*		

^{*:} ECM determines the start signal status by the signals of engine speed and battery voltage.

SYSTEM DESCRIPTION

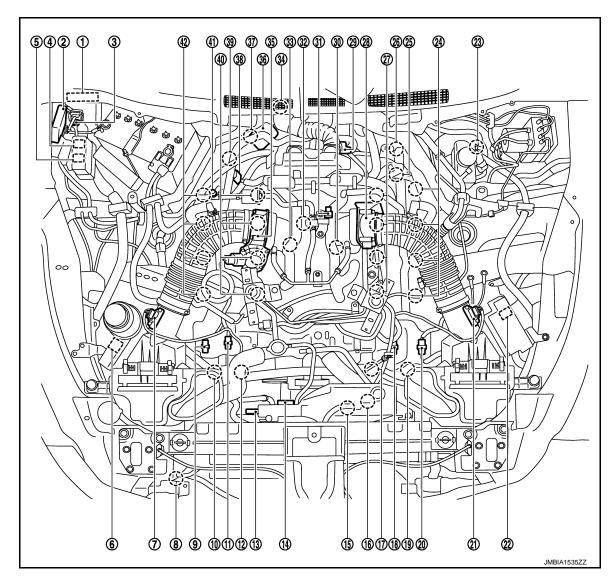
The fuel pump control module (FPCM) controls the discharging volume of the fuel pump by the FPCM control signals (Low/Mid/High) depending on driving conditions.

Conditions	Amount of fuel flow	Supplied voltage
 For 1 second after turning ignition switch ON Engine is running under low load and low speed conditions 	Low	Approximately 8.5 V
 Engine cranking Engine coolant temperature is below 10°C (50°F) Engine is running under high load and high speed conditions 	High	Battery voltage (11 - 14 V)
Except the above	Mid	Approximately 10 V

[VK50VE]

Component Parts Location

INFOID:0000000004020126



- IPDM E/R
- VVEL actuator motor relay
- 7. Mass air flow sensor (bank 2)
- 10. Exhaust valve timing control solenoid valve (bank 2)
- 13. Cooling fan motor-1
- Cooling fan control module-2
- 19. Exhaust valve timing control solenoid valve (bank 1)
- 22. ICC brake hold relay (ICC models)
- 25. VVEL actuator motor (bank 1)
- 28. Electric throttle control actuator (bank 1)

- VVEL control module
- 5. Cooling fan relay-1
- Refrigerant pressure sensor
- 11. Camshaft position sensor (bank 2)
- 14. Cooling fan control module-1
- 17. Intake valve timing control solenoid valve (bank 1)
- 20. Exhaust valve timing control position 21. Mass air flow sensor (with intake air sensor (bank 1)
- 23. Brake booster pressure sensor
- 26. VVEL control shaft position sensor (bank 1)
- 29. A/F sensor 1 (bank 1)

- Battery current sensor
- 6. Cooling fan relay-2
- Exhaust valve timing control position sensor (bank 2)
- Intake valve timing control solenoid valve (bank 2)
- Cooling fan motor-2 15.
- Camshaft position sensor (bank 1) 18.
- temperature sensor) (bank 1)
- 24. Ignition coil (with power transistor) and spark plug (bank 1)
- 27. Fuel injector (bank 1)
- 30. Knock sensor (bank 1)

EC

Α

D

Е

Н

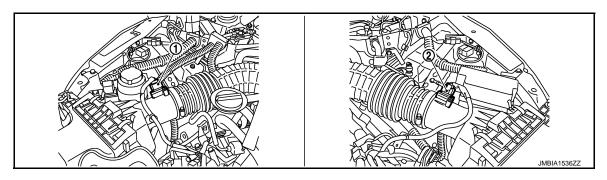
M

Ν

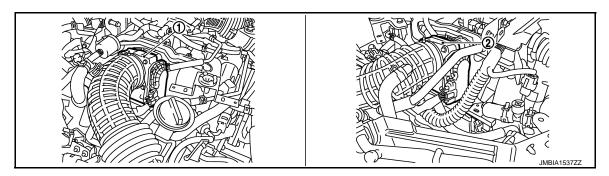
- 31. EVAP canister purge volume control solenoid valve
- 32. Manifold pressure sensor (This sensor is not for controlling the engine system, nor for the on board diagnosis.)
- 33. Knock sensor (bank 2)

- 34. Crankshaft position sensor
- 35. Electric throttle control actuator (bank2)
- 36. VVEL actuator motor (bank 2)
- 37. VVEL control shaft position sensor 38. A/F sensor 1 (bank 2)
 - (bank 2)
- 39. Engine coolant temperature sensor

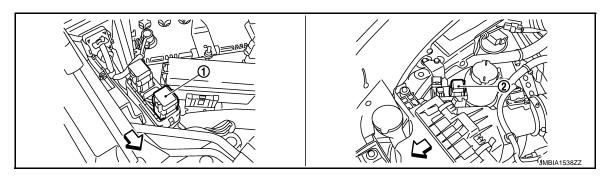
- 40. Fuel injector (bank 2)
- 41. EVAP service port
- 42. Ignition coil (with power transistor) and spark plug (bank 2)



- Mass air flow sensor (bank 2)
- 2. Mass air flow sensor (with intake air temperature sensor) (bank 1)

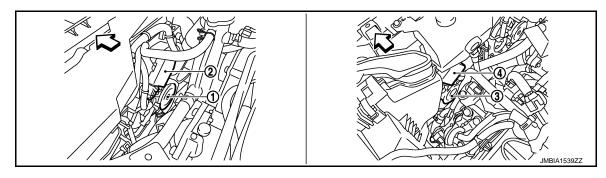


- Electric throttle control actuator (bank 2)
- 2. Electric throttle control actuator (bank 1)



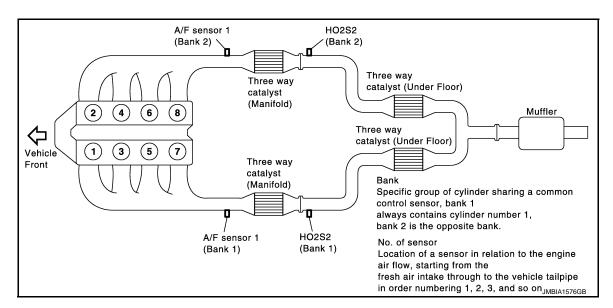
- Cooling fan relay-1
- 2. Cooling fan relay-2

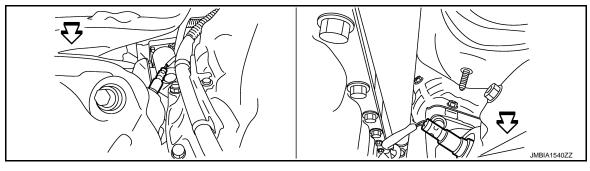
⟨□ Vehicle front



- 1. Cooling fan motor-1
- 2. Cooling fan control module-1
- 3. Cooling fan motor-2

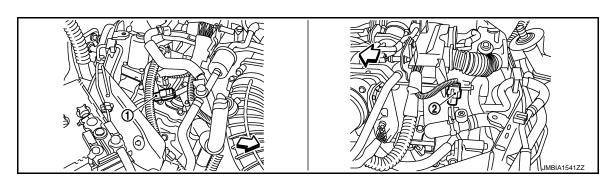
- 4. Cooling fan control module-2
- Vehicle front





- 1. A/F sensor 1 (bank 1)
- 2. A/F sensor 1 (bank 2)

Vehicle front



EC

Α

C

D

Е

=

G

Н

J

M

Ν

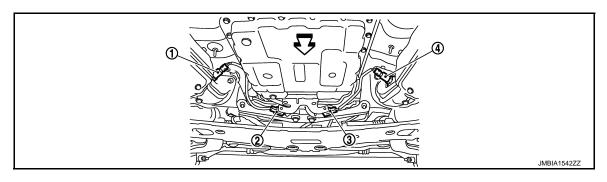
 \cap

Р

Revision: 2009 March EC-679 2009 FX35/FX50

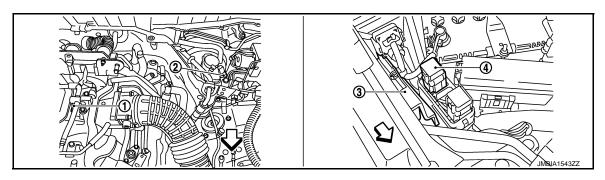
- A/F sensor 1 (bank 2) harness con- 2.
- nector
- A/F sensor 1 (bank 1) harness connector

⟨
→ Vehicle front



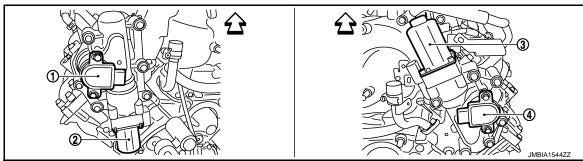
- Heated oxygen sensor 2 (bank 1)
- Heated oxygen sensor 2 (bank 1) harness connector
- Heated oxygen sensor 2 (bank 2) harness connector

- Heated oxygen sensor 2 (bank 2)
- Vehicle front



- Manifold pressure sensor (This sensor is not for controlling the engine system, nor for the on board diagnosis.)
- Brake booster pressure sensor
- VVEL control module 3.

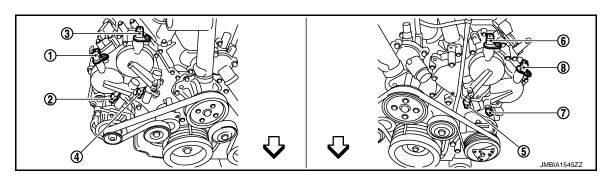
- VVEL actuator motor relay
- ∀ Vehicle front



2. VVEL actuator motor (bank 1)

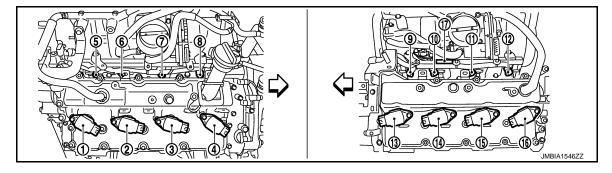
- VVEL control shaft position sensor (bank 1)
- VVEL control shaft position sensor (bank 2)
- ∀ Vehicle front

- - VVEL actuator motor (bank 2)



- Exhaust valve timing control position 2. sensor (bank 2)
- Intake valve timing control solenoid valve (bank 2)
- Exhaust valve timing control solenoid 8. valve (bank 1)
- ∀ Vehicle front

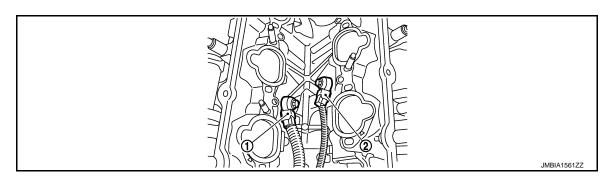
- Exhaust valve timing control solenoid 3. valve (bank 2)
- Intake valve timing control solenoid valve (bank 1)
- Exhaust valve timing control position sensor (bank 1)
- Camshaft position sensor (bank 2)
- Camshaft position sensor (bank 1)



- Ignition coil No.8 (with power transis- 2.
- Ignition coil No.2 (with power transis- 5. tor)
- 7. Fuel injector No.4
- 10. Fuel injector No.3
- 13. Ignition coil No.1 (with power transis- 14.
- 16. Ignition coil No.7 (with power transis- 17. Condenser
- tor)
- Fuel injector No.8
- Fuel injector No.2
- 11. Fuel injector No.5
- Ignition coil No.3 (with power transis- 15.

- Ignition coil No.6 (with power transis- 3. Ignition coil No.4 (with power transistor)
 - Fuel injector No.6
 - 9. Fuel injector No.1
 - 12. Fuel injector No.7
 - Ignition coil No.5 (with power transistor)

∀ Vehicle front



Knock sensor (bank 2)

Knock sensor (bank 1)

EC-681 Revision: 2009 March 2009 FX35/FX50

Α

EC

D

Е

F

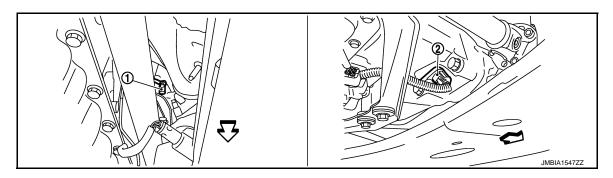
Н

K

M

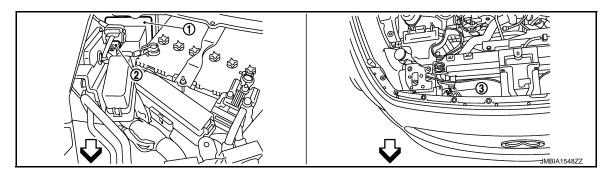
Ν

Ρ



- Engine coolant temperature sensor 2. Crankshaft position sensor

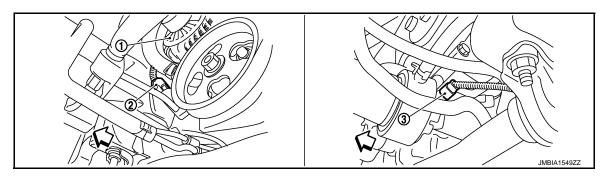
∀ Vehicle front



IPDM E/R

- Battery current sensor
- Refrigerant pressure sensor

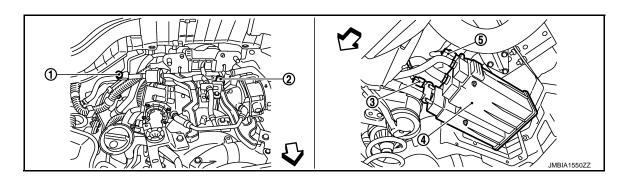
∀ Vehicle front



Alternator

- Power steering pressure sensor
- 3. Engine oil temperature sensor

∀ Vehicle front



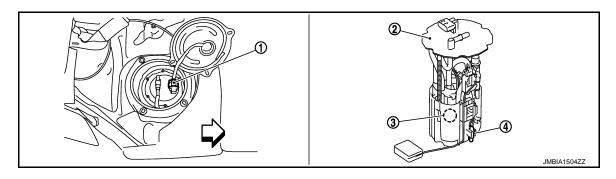
FUEL PUMP CONTROL MODULE

< SYSTEM DESCRIPTION > [VK50VE]

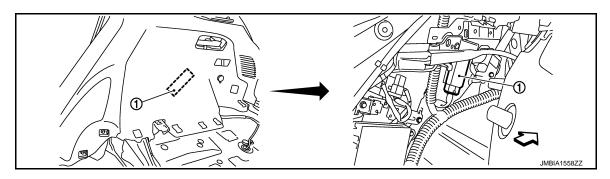
- EVAP service port
- EVAP canister purge volume control 3. EVAP canister vent control valve solenoid valve

4. EVAP canister

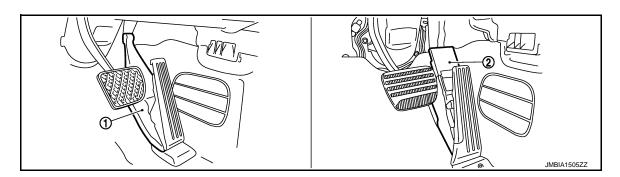
5. EVAP control system pressure sensor



- Fuel level sensor unit and fuel pump 2. Fuel level sensor unit and fuel pump 3. Fuel pressure regulator harness connector
- 4. Fuel tank temperature sensor
- ∀ Vehicle front



- 1. FPCM



- Accelerator pedal position sensor (without DCA system)
- Accelerator pedal position sensor (with DCA system)

EC

Α

D

Е

F

G

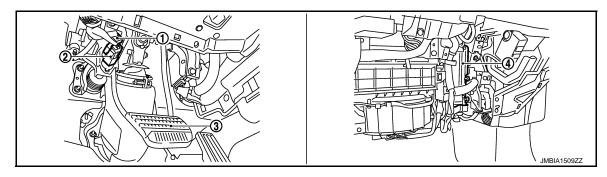
Н

-

M

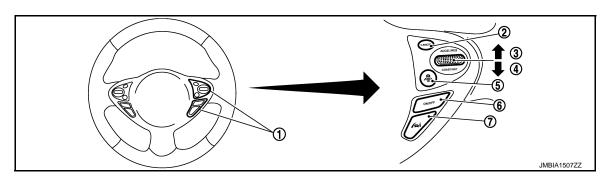
Ν

0



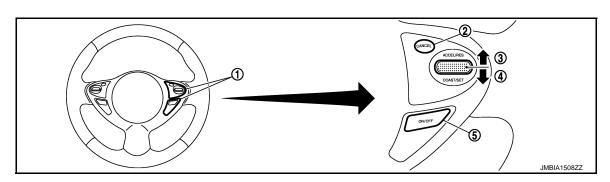
- Stop lamp switch
- 2. ASCD brake switch (ASCD models) 3. ICC brake switch (ICC models)
 - Brake pedal

4. ECM



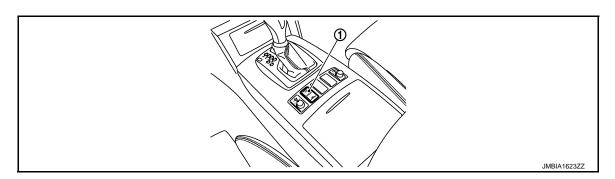
- 1. ICC steering switch
- 4. SET/COAST switch
- 7. LDP switch

- 2. CANCEL switch
- 5. DISTANCE switch
- 3. RESUME/ACCELERATE switch
- 6. MAIN switch



- ASCD steering switch
 SET/COAST switch
- CANCEL switch
- 5. MAIN switch

RESUME/ACCELERATE switch



1. Snow mode switch

FUEL PUMP CONTROL MODULE

< SYSTEM DESCRIPTION >

[VK50VE]

Component Description

INFOID:0000000003977713

Component	Reference
Camshaft position sensor	EC-871, "Description"
Crankshaft position sensor	EC-867, "Description"
Engine coolant temperature sensor	EC-784, "Description"
Fuel pump control module (FPCM)	EC-993, "Description"
Mass air flow sensor	EC-775, "Description"

EC

Α

D

Е

F

G

Н

ı

K

L

M

Ν

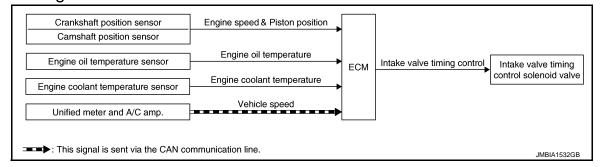
0

Ρ

INTAKE VALVE TIMING CONTROL

System Diagram

INFOID:0000000003958667



System Description

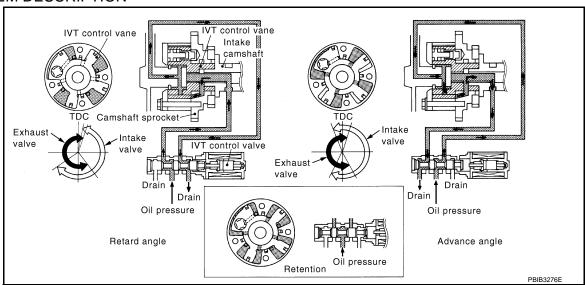
INFOID:0000000003958668

INPUT/OUTPUT SIGNAL CHART

Sensor	Input signal to ECM	ECM function	Actuator		
Crankshaft position sensor	Engine speed and piston position				
Camshaft position sensor	Engine speed and piston position		Intake valve timing control solenoid valve		
Engine oil temperature sensor	Engine oil temperature	Intake valve timing control			
Engine coolant temperature sensor	Engine coolant temperature				
Unified meter and A/C amp.	Vehicle speed*				

^{*:} This signal is sent to the ECM via the CAN communication line.

SYSTEM DESCRIPTION

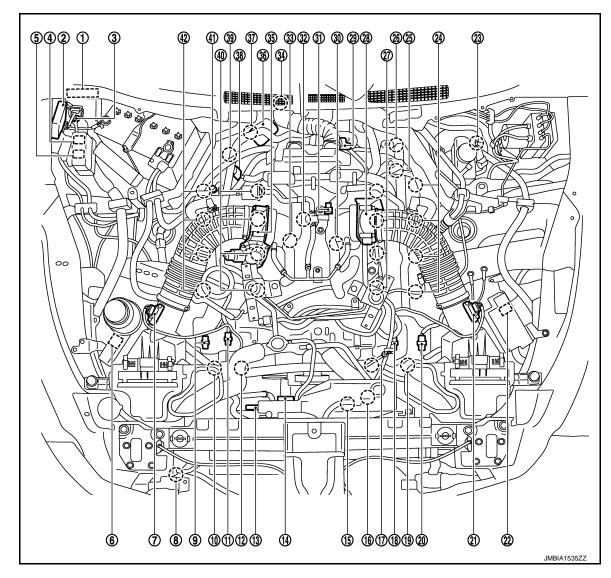


This mechanism hydraulically controls cam phases continuously with the fixed operating angle of the intake valve.

The ECM receives signals such as crankshaft position, camshaft position, engine speed, and engine coolant temperature. Then, the ECM sends ON/OFF pulse duty signals to the intake valve timing control solenoid valve depending on driving status. This makes it possible to control the shut/open timing of the intake valve to increase engine torque in low/mid speed range and output in high speed range.

Component Parts Location

INFOID:0000000003958669



- IPDM E/R
- VVEL actuator motor relay
- 7. Mass air flow sensor (bank 2)
- 10. Exhaust valve timing control solenoid valve (bank 2)
- 13. Cooling fan motor-1
- Cooling fan control module-2
- 19. Exhaust valve timing control solenoid valve (bank 1)
- 22. ICC brake hold relay (ICC models)
- 25. VVEL actuator motor (bank 1)
- 28. Electric throttle control actuator (bank 1)

- VVEL control module
- 5. Cooling fan relay-1
- Refrigerant pressure sensor
- 11. Camshaft position sensor (bank 2)
- 14. Cooling fan control module-1
- 17. Intake valve timing control solenoid valve (bank 1)
- sensor (bank 1)
- 23. Brake booster pressure sensor
- 26. VVEL control shaft position sensor (bank 1)
- 29. A/F sensor 1 (bank 1)

- Battery current sensor
- 6. Cooling fan relay-2
- Exhaust valve timing control position sensor (bank 2)
- Intake valve timing control solenoid valve (bank 2)
- Cooling fan motor-2
- Camshaft position sensor (bank 1) 18.
- 20. Exhaust valve timing control position 21. Mass air flow sensor (with intake air temperature sensor) (bank 1)
 - 24. Ignition coil (with power transistor) and spark plug (bank 1)
 - 27. Fuel injector (bank 1)
 - 30. Knock sensor (bank 1)

EC

Α

D

Е

Н

M

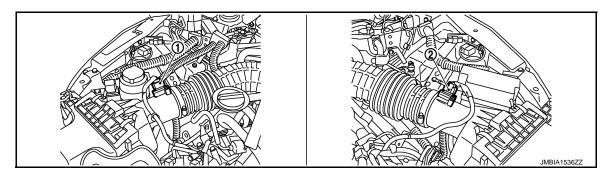
Ν

Р

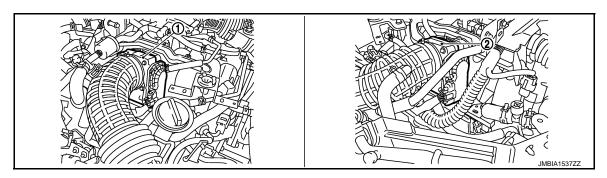
EC-687 Revision: 2009 March 2009 FX35/FX50

and spark plug (bank 2)

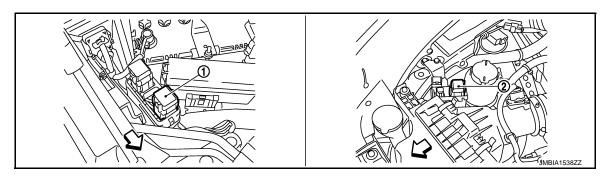
33. Knock sensor (bank 2) 31. EVAP canister purge volume con-32. Manifold pressure sensor (This sensor is not for controlling the trol solenoid valve engine system, nor for the on board diagnosis.) 35. Electric throttle control actuator 36. VVEL actuator motor (bank 2) 34. Crankshaft position sensor (bank2) 37. VVEL control shaft position sensor 38. A/F sensor 1 (bank 2) 39. Engine coolant temperature sensor (bank 2) 40. Fuel injector (bank 2) 41. EVAP service port 42. Ignition coil (with power transistor)



- 1. Mass air flow sensor (bank 2)
- 2. Mass air flow sensor (with intake air temperature sensor) (bank 1)

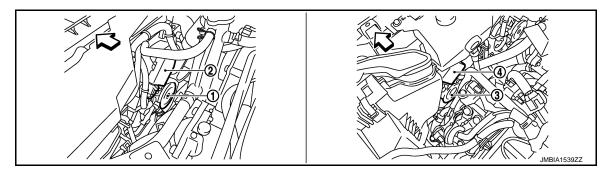


- . Electric throttle control actuator (bank 2)
- 2. Electric throttle control actuator (bank 1)



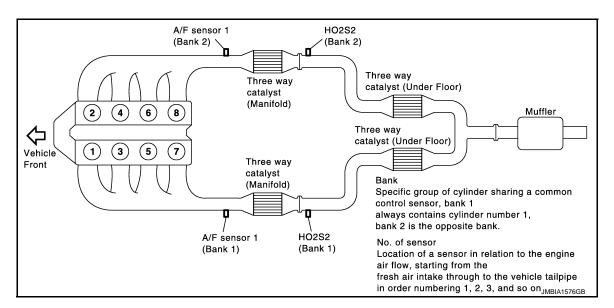
- 1. Cooling fan relay-1
- ⟨□ Vehicle front

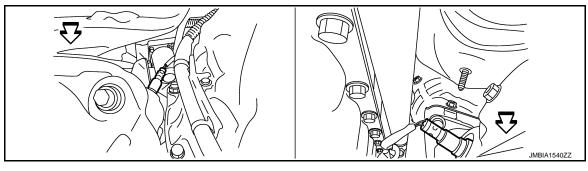
2. Cooling fan relay-2



- 1. Cooling fan motor-1
- 2. Cooling fan control module-1
- 3. Cooling fan motor-2

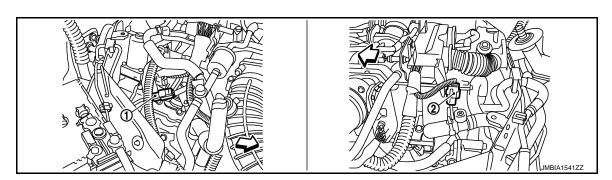
- 4. Cooling fan control module-2
- Vehicle front





- 1. A/F sensor 1 (bank 1)
- 2. A/F sensor 1 (bank 2)

Vehicle front



Revision: 2009 March **EC-689** 2009 FX35/FX50

EC

Α

D

Е

_

G

Н

J

1 \

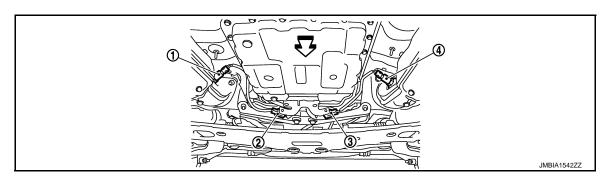
...

Ν

0

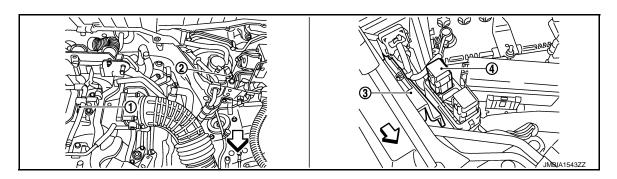
- A/F sensor 1 (bank 2) harness con- 2. nector
- 2. A/F sensor 1 (bank 1) harness connector

⟨□ Vehicle front



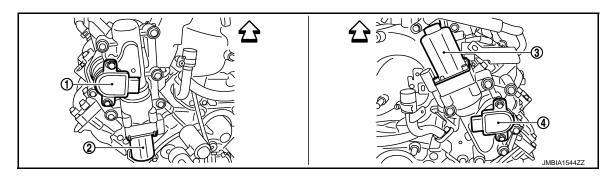
- 1. Heated oxygen sensor 2 (bank 1)
- Heated oxygen sensor 2 (bank 1) harness connector
- Heated oxygen sensor 2 (bank 2) harness connector

- 4. Heated oxygen sensor 2 (bank 2)
- ∀ Vehicle front



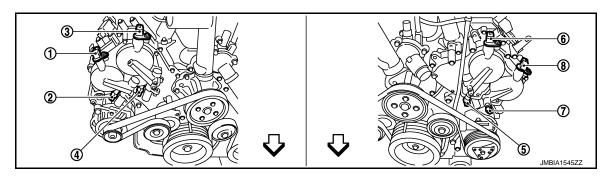
- Manifold pressure sensor (This sensor is not for controlling the engine system, nor for the on board diagnosis.)
- 2. Brake booster pressure sensor
- 3. VVEL control module

- 4. VVEL actuator motor relay
- ∀ Vehicle front



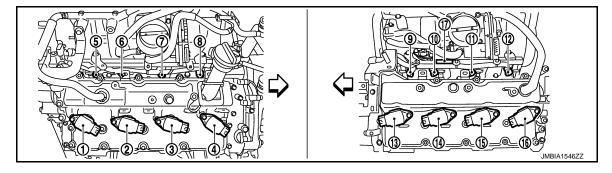
- VVEL control shaft position sensor (bank 1)
- 2. VVEL actuator motor (bank 1)
- 3. VVEL actuator motor (bank 2)

- 4. VVEL control shaft position sensor (bank 2)
- Vehicle front



- Exhaust valve timing control position 2. sensor (bank 2)
- Intake valve timing control solenoid valve (bank 2)
- Exhaust valve timing control solenoid 8. valve (bank 1)
- ∀ Vehicle front

- Exhaust valve timing control solenoid 3. valve (bank 2)
- Intake valve timing control solenoid valve (bank 1)
- Exhaust valve timing control position sensor (bank 1)
- Camshaft position sensor (bank 2)
- Camshaft position sensor (bank 1)

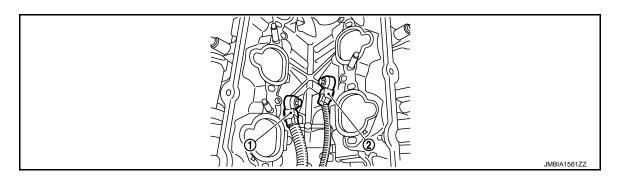


- Ignition coil No.8 (with power transis- 2.
- Ignition coil No.2 (with power transis- 5. tor)
- 7. Fuel injector No.4
- 10. Fuel injector No.3
- 13. Ignition coil No.1 (with power transis- 14.
- 16. Ignition coil No.7 (with power transis- 17. Condenser tor)

- Ignition coil No.6 (with power transis- 3.
- Fuel injector No.8
- Fuel injector No.2
- 11. Fuel injector No.5
- Ignition coil No.3 (with power transis- 15.

- Ignition coil No.4 (with power transistor)
- Fuel injector No.6
- 9. Fuel injector No.1
- 12. Fuel injector No.7
 - Ignition coil No.5 (with power transistor)

∀ Vehicle front



Knock sensor (bank 2)

Knock sensor (bank 1)

EC-691 Revision: 2009 March 2009 FX35/FX50

Α

EC

D

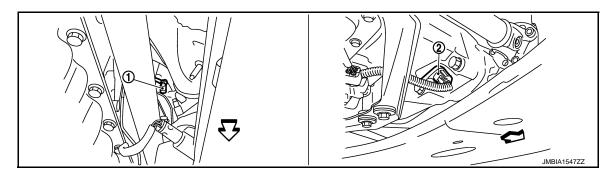
Е

F

K

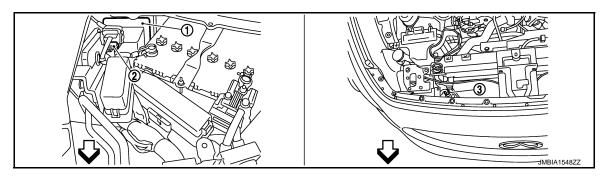
M

Ν



- Engine coolant temperature sensor 2. Crankshaft position sensor

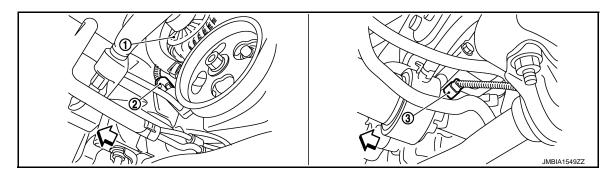
∀ Vehicle front



IPDM E/R

- Battery current sensor
- Refrigerant pressure sensor

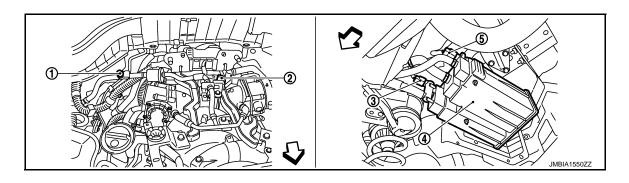
∀ Vehicle front



Alternator

- Power steering pressure sensor
- 3. Engine oil temperature sensor

∀ Vehicle front



INTAKE VALVE TIMING CONTROL

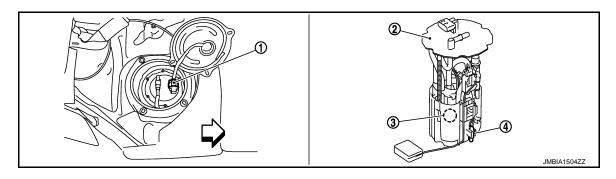
< SYSTEM DESCRIPTION > [VK50VE]

- EVAP service port
- EVAP canister purge volume control 3. EVAP canister vent control valve solenoid valve

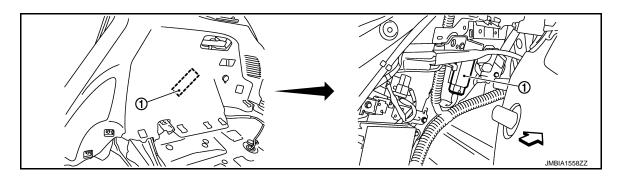
4. EVAP canister

5. EVAP control system pressure sensor

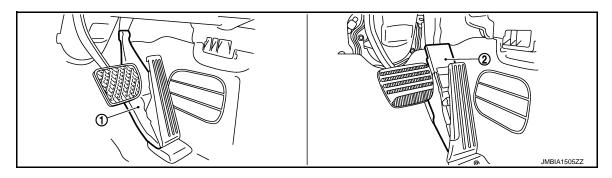
Vehicle front



- Fuel level sensor unit and fuel pump 2. Fuel level sensor unit and fuel pump 3. Fuel pressure regulator harness connector
- 4. Fuel tank temperature sensor
- ∀ Vehicle front



- 1. FPCM
- ∀ Vehicle front



- Accelerator pedal position sensor (without DCA system)
- Accelerator pedal position sensor (with DCA system)

EC

Α

D

Е

F

G

Н

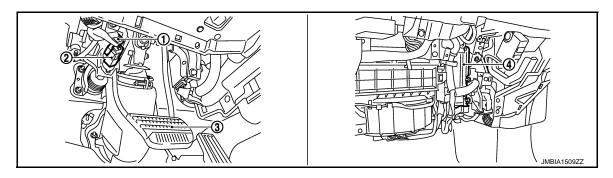
J

-

M

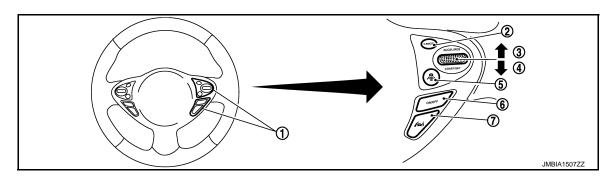
Ν

0



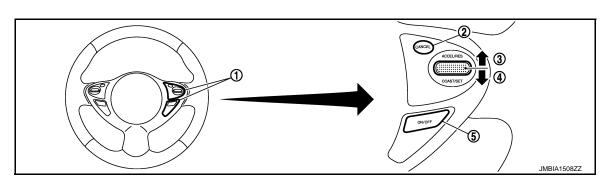
- Stop lamp switch
- 2. ASCD brake switch (ASCD models) 3. ICC brake switch (ICC models)
 - Brake pedal

4. ECM



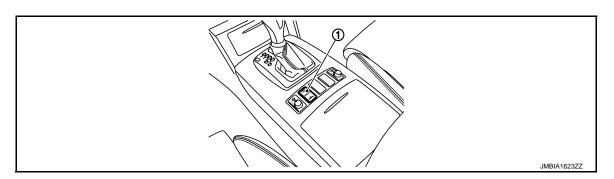
- 1. ICC steering switch
- 4. SET/COAST switch
- 7. LDP switch

- 2. CANCEL switch
- 5. DISTANCE switch
- 3. RESUME/ACCELERATE switch
- 6. MAIN switch



- ASCD steering switch
 SET/COAST switch
- 2. CANCEL switch
- 5. MAIN switch

RESUME/ACCELERATE switch



1. Snow mode switch

INTAKE VALVE TIMING CONTROL

< SYSTEM DESCRIPTION >

[VK50VE]

Component Description

INFOID:0000000003958670

Component	Reference
Camshaft position sensor	EC-871, "Description"
Crankshaft position sensor	EC-867, "Description"
Engine coolant temperature sensor	EC-784, "Description"
Intake valve timing control solenoid valve	EC-762, "Description"

EC

Α

D

Е

F

G

Н

1

K

L

M

Ν

0

Ρ

VVEL SYSTEM

System Diagram

Crankshaft position sensor
Camshaft position sensor

Accelerator pedal position

Accelerator pedal position

Control shaft actual angle

VVEL control

WVEL control

WVEL control

WVEL control

WVEL actuator

sub assembly

System Description

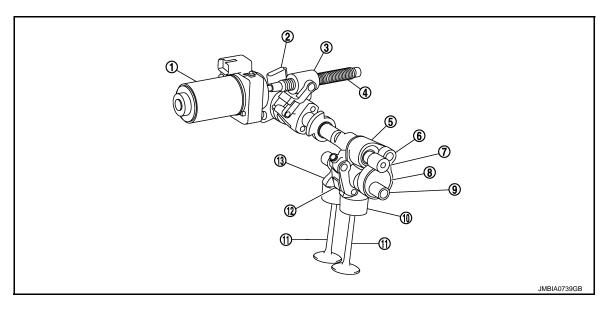
INFOID:0000000003959717

INPUT/OUTPUT SIGNAL CHART

Sensor	Input signal to ECM	ECM function	Actuator	
Camshaft position sensor Crankshaft position sensor	Engine speed and piston position		VVEL control module	
Accelerator pedal position sensor	Accelerator pedal position	VVEL control	↓ VVEL actuator sub assembly	
VVEL control shaft position sensor	Control shaft actual angle*		VVEL actuator sub assembly	

^{*:} This signal is sent to the ECM via the CAN communication line

SYSTEM DESCRIPTION



- VVEL actuator motor
- 4. Ball screw shaft
- 7. Control shaft
- 10. Valve lifter
- 13. Output cam

- 2. VVEL control shaft position sensor
- 5. Rocker arm
- 8. Eccentric cam
- 11. Intake valve

- Ball screw nut
- 6. Link A
- 9. Drive shaft
- 12. Link B

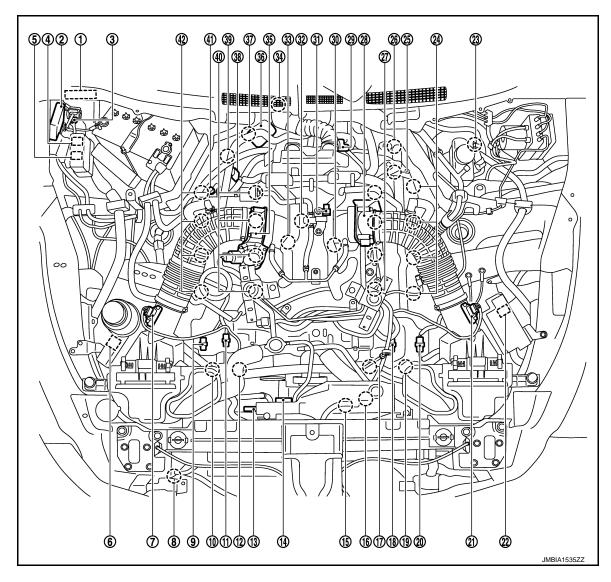
VVEL (Variable Valve Event & Lift) is a system that controls valve event and valve lift continuously. Rotational movement of the drive shaft equipped with eccentric cam is transmitted to output cam via the rocker arm and two kinds of links to depress the intake valve. ECM decides the target valve lift according to the driving condition and sends the command signal to the VVEL control module. The VVEL control module controls the rotation of the control shaft using the VVEL actuator motor and changes the movement of the output cam by

[VK50VE]

shifting the link supporting point. As a result, valve lift changes continuously to improve engine output and response.

Component Parts Location

INFOID:0000000004020131



- IPDM E/R 1.
- 4. VVEL actuator motor relay
- Mass air flow sensor (bank 2)
- Exhaust valve timing control solenoid valve (bank 2)
- 13. Cooling fan motor-1
- Cooling fan control module-2
- 19. Exhaust valve timing control solenoid valve (bank 1)
- 22. ICC brake hold relay (ICC models)
- 25. VVEL actuator motor (bank 1)
- 28. Electric throttle control actuator (bank 1)

- 2. VVEL control module
- 5. Cooling fan relay-1
- 8. Refrigerant pressure sensor
- 11. Camshaft position sensor (bank 2)
- 14. Cooling fan control module-1
- 17. Intake valve timing control solenoid valve (bank 1)
- 20. Exhaust valve timing control position 21. sensor (bank 1)
- 23. Brake booster pressure sensor
- 26. VVEL control shaft position sensor (bank 1)
- 29. A/F sensor 1 (bank 1)

- Battery current sensor 3.
- Cooling fan relay-2
- Exhaust valve timing control position sensor (bank 2)
- Intake valve timing control solenoid valve (bank 2)
- Cooling fan motor-2
- Camshaft position sensor (bank 1) 18.
- Mass air flow sensor (with intake air temperature sensor) (bank 1)
- Ignition coil (with power transistor) 24. and spark plug (bank 1)
- 27. Fuel injector (bank 1)
- 30. Knock sensor (bank 1)

EC

Α

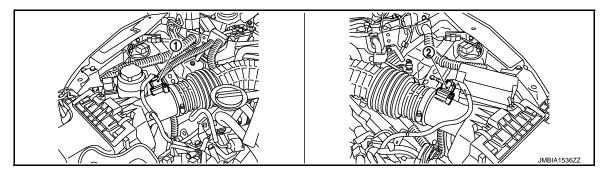
D

Н

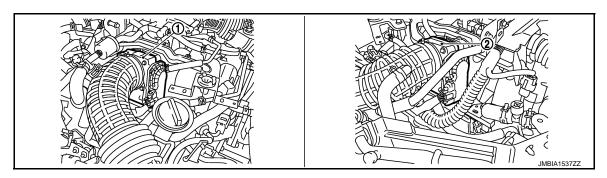
Ν

and spark plug (bank 2)

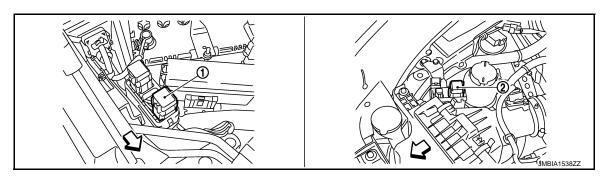
31. EVAP canister purge volume con-33. Knock sensor (bank 2) 32. Manifold pressure sensor (This sensor is not for controlling the trol solenoid valve engine system, nor for the on board diagnosis.) 35. Electric throttle control actuator 36. VVEL actuator motor (bank 2) 34. Crankshaft position sensor (bank2) 37. VVEL control shaft position sensor 38. A/F sensor 1 (bank 2) 39. Engine coolant temperature sensor (bank 2) 40. Fuel injector (bank 2) 41. EVAP service port 42. Ignition coil (with power transistor)



- 1. Mass air flow sensor (bank 2)
- 2. Mass air flow sensor (with intake air temperature sensor) (bank 1)

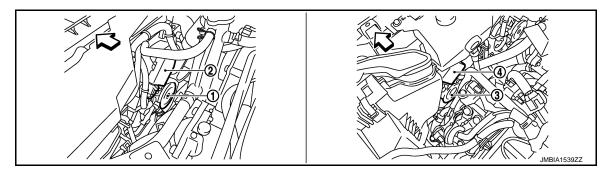


- Electric throttle control actuator (bank 2)
- 2. Electric throttle control actuator (bank 1)



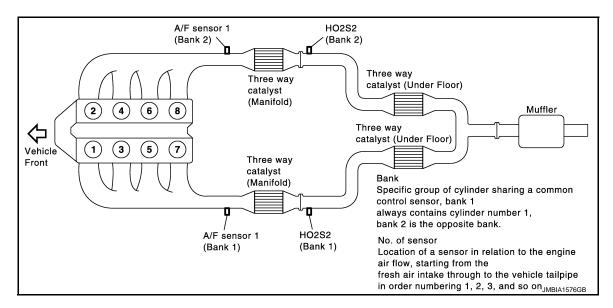
- 1. Cooling fan relay-1
- √□ Vehicle front

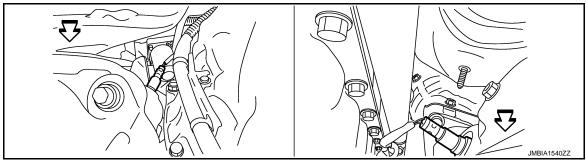
2. Cooling fan relay-2



- 1. Cooling fan motor-1
- 2. Cooling fan control module-1
- 3. Cooling fan motor-2

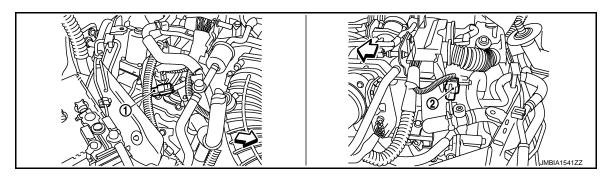
- 4. Cooling fan control module-2
- Vehicle front





- 1. A/F sensor 1 (bank 1)
- 2. A/F sensor 1 (bank 2)

Vehicle front



Revision: 2009 March EC-699 2009 FX35/FX50

EC

Α

D

Е

F

G

Н

J

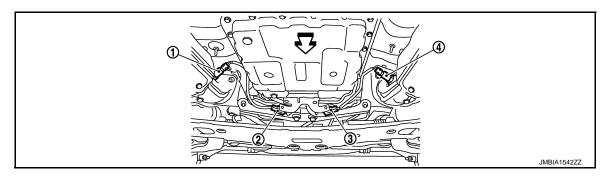
M

Ν

0

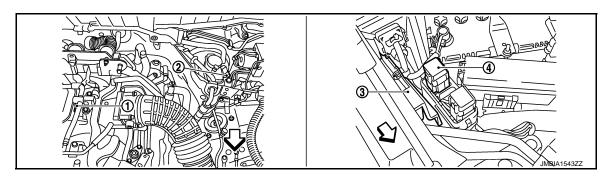
- A/F sensor 1 (bank 2) harness con- 2. nector
- ⟨ Vehicle front

A/F sensor 1 (bank 1) harness connector



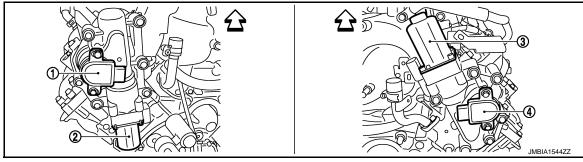
- Heated oxygen sensor 2 (bank 1) 1.
- Heated oxygen sensor 2 (bank 1) harness connector
- Heated oxygen sensor 2 (bank 2) harness connector

- Heated oxygen sensor 2 (bank 2) 4.
- ∀ Vehicle front



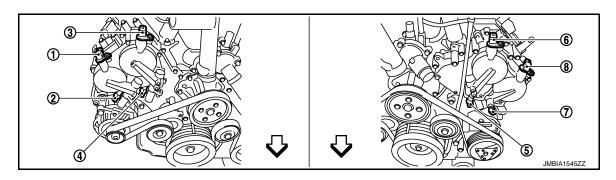
- Manifold pressure sensor (This sensor is not for controlling the engine system, nor for the on board diagnosis.)
- Brake booster pressure sensor
- VVEL control module 3.

- VVEL actuator motor relay
- ∀ Vehicle front



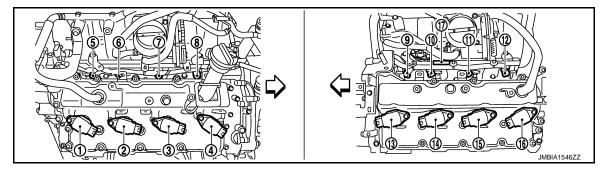
2. VVEL actuator motor (bank 1)

- VVEL control shaft position sensor (bank 1)
- VVEL control shaft position sensor (bank 2)
- ∀ Vehicle front
- - VVEL actuator motor (bank 2)



- Exhaust valve timing control position 2. sensor (bank 2)
- Intake valve timing control solenoid valve (bank 2)
- Exhaust valve timing control solenoid 8. valve (bank 1)
- ∀ Vehicle front

- Exhaust valve timing control solenoid 3. valve (bank 2)
- Intake valve timing control solenoid valve (bank 1)
- Exhaust valve timing control position sensor (bank 1)
- Camshaft position sensor (bank 2)
- Camshaft position sensor (bank 1)

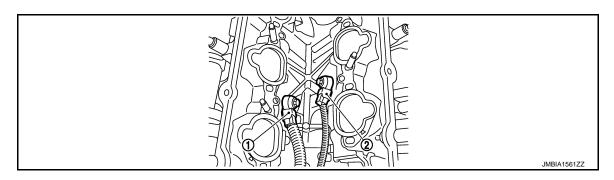


- Ignition coil No.8 (with power transis- 2.
- Ignition coil No.2 (with power transis- 5. 4. tor)
- 7. Fuel injector No.4
- 10. Fuel injector No.3
- 13. Ignition coil No.1 (with power transis- 14. Ignition coil No.3 (with power transis- 15.
- 16. Ignition coil No.7 (with power transis- 17. Condenser tor)

- Ignition coil No.6 (with power transis- 3.
- Fuel injector No.8
- Fuel injector No.2
- 11. Fuel injector No.5

- Ignition coil No.4 (with power transistor)
- Fuel injector No.6 6.
- 9. Fuel injector No.1
- 12. Fuel injector No.7
 - Ignition coil No.5 (with power transistor)

∀ Vehicle front



- Knock sensor (bank 2)
- Knock sensor (bank 1)

EC-701 Revision: 2009 March 2009 FX35/FX50

Α

EC

D

Е

F

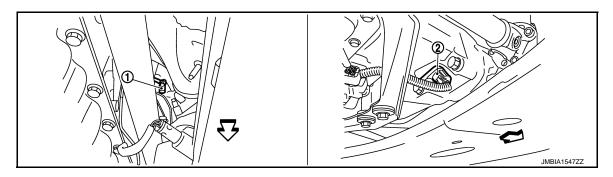
Н

K

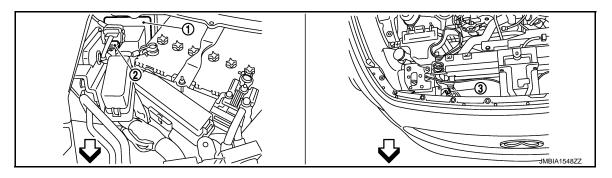
M

Ν

Ρ



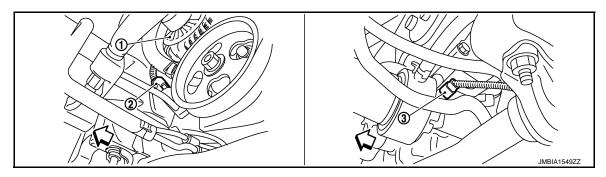
- . Engine coolant temperature sensor 2. Crankshaft position sensor
- ∀ Vehicle front



1. IPDM E/R

- 2. Battery current sensor
- 3. Refrigerant pressure sensor

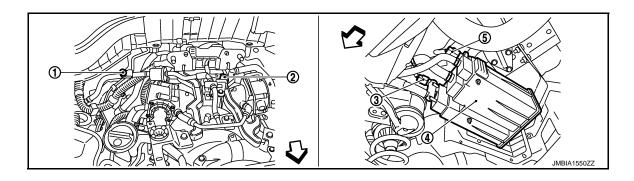
∀ Vehicle front



1. Alternator

- 2. Power steering pressure sensor
- 3. Engine oil temperature sensor

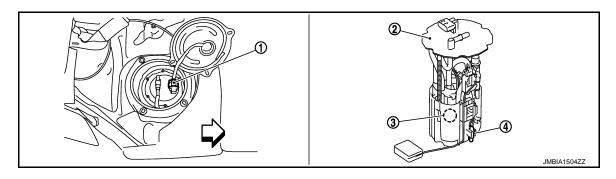
∀ Vehicle front



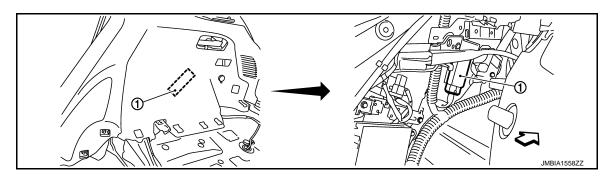
- EVAP service port
- EVAP canister purge volume control 3. EVAP canister vent control valve solenoid valve

4. EVAP canister

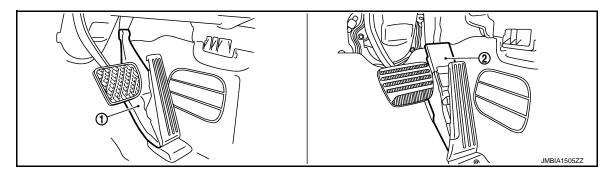
5. EVAP control system pressure sensor



- Fuel level sensor unit and fuel pump 2. Fuel level sensor unit and fuel pump 3. Fuel pressure regulator harness connector
- 4. Fuel tank temperature sensor
- ∀ Vehicle front



- 1. FPCM
- ∀ Vehicle front



- Accelerator pedal position sensor (without DCA system)
- Accelerator pedal position sensor (with DCA system)

EC

Α

D

Е

F

G

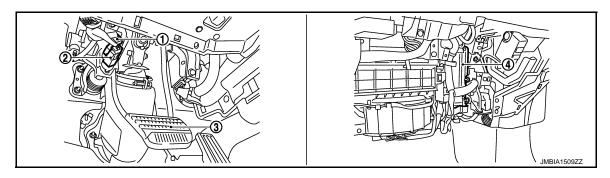
Н

L

M

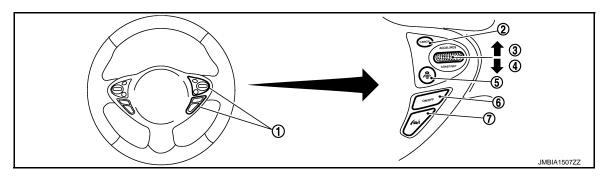
Ν

0



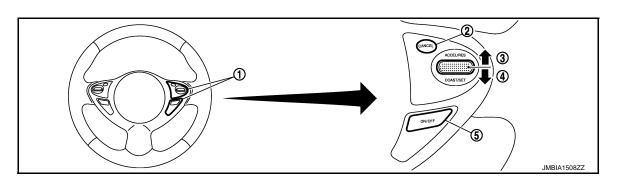
- Stop lamp switch
- 2. ASCD brake switch (ASCD models) 3. ICC brake switch (ICC models)
 - Brake pedal

4. ECM



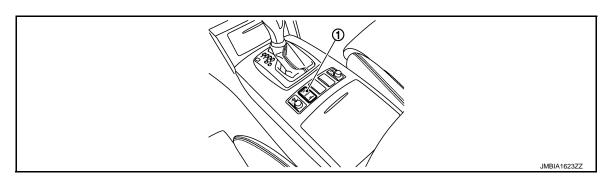
- 1. ICC steering switch
- 4. SET/COAST switch
- 7. LDP switch

- 2. CANCEL switch
- 5. DISTANCE switch
- 3. RESUME/ACCELERATE switch
- 6. MAIN switch



- ASCD steering switch
- 4. SET/COAST switch
- 2. CANCEL switch
- 5. MAIN switch

RESUME/ACCELERATE switch



1. Snow mode switch

VVEL SYSTEM

< SYSTEM DESCRIPTION >

[VK50VE]

Component Description

INFOID:0000000003959719

Component	Reference		
Accelerator pedal position sensor	EC-1067, "Description"		
Camshaft position sensor	EC-867, "Description"		
Crankshaft position sensor	EC-867, "Description"		
VVEL actuator motor	EC-979, "Description"		
VVEL actuator motor relay	EC-983, "Description"		
VVEL control module	EC-1056, "Description"		
VVEL control shaft position sensor	EC-975, "Description"		

D

Α

EC

Е

F

G

Н

1

J

Κ

L

M

Ν

0

Ρ

[VK50VE]

ON BOARD DIAGNOSTIC (OBD) SYSTEM

Diagnosis Description

INFOID:0000000003958671

INTRODUCTION

The ECM has an on board diagnostic system, which detects malfunctions related to engine sensors or actuators. The ECM also records various emission-related diagnostic information including:

Emission-related diagnostic information	Diagnostic service
Diagnostic Trouble Code (DTC)	Service \$03 of SAE J1979
Freeze Frame data	Service \$02 of SAE J1979
System Readiness Test (SRT) code	Service \$01 of SAE J1979
1st Trip Diagnostic Trouble Code (1st Trip DTC)	Service \$07 of SAE J1979
1st Trip Freeze Frame data	-
Test values and Test limits	Service \$06 of SAE J1979
Calibration ID	Service \$09 of SAE J1979

The above information can be checked using procedures listed in the table below.

×: Applicable —: Not applicable

	DTC	1st trip DTC	Freeze Frame data	1st trip Freeze Frame data	SRT code	SRT status	Test value
CONSULT-III	×	×	×	×	×	×	_
GST	×	×	×	_	×	×	×
ECM	×	×*	_	_	_	×	_

^{*:} When DTC and 1st trip DTC simultaneously appear on the display, they cannot be clearly distinguished from each other.

The malfunction indicator lamp (MIL) on the instrument panel illuminates when the same malfunction is detected in two consecutive trips (Two trip detection logic), or when the ECM enters fail-safe mode. (Refer to <u>EC-1168, "Fail-safe"</u>.)

TWO TRIP DETECTION LOGIC

When a malfunction is detected for the first time, 1st trip DTC and 1st trip Freeze Frame data are stored in the ECM memory. The MIL will not illuminate at this stage. <1st trip>

If the same malfunction is detected again during the next drive, the DTC and Freeze Frame data are stored in the ECM memory, and the MIL illuminates. The MIL illuminates at the same time when the DTC is stored. <2nd trip> The "trip" in the "Two Trip Detection Logic" means a driving mode in which self-diagnosis is performed during vehicle operation. Specific on board diagnostic items will cause the ECM to illuminate or blink the MIL, and store DTC and Freeze Frame data, even in the 1st trip, as shown below.

×: Applicable —: Not applicable

	MIL				DTC		1st trip DTC	
Items	1st trip		2nd trip		1st trip	2nd trip	1st trip	2nd trip
	Blinking	Illuminate	Blinking	Illuminate	displaying	displaying	displaying	displaying
Misfire (Possible three way catalyst damage) — DTC: P0300 - P0308 is being detected	×	_	_	_	_	_	×	_
Misfire (Possible three way catalyst damage) — DTC: P0300 - P0308 is being detected	_	_	×	_	_	×	_	_
One trip detection diagnoses (Refer to <u>EC-1172</u> , " <u>DTC Index</u> ".)	_	×	_	_	×	_	_	_
Except above		_	_	×	_	×	×	_

DTC AND FREEZE FRAME DATA

DTC and 1st Trip DTC

< SYSTEM DESCRIPTION >

[VK50VE]

The 1st trip DTC (whose number is the same as the DTC number) is displayed for the latest self-diagnostic result obtained. If the ECM memory was cleared previously, and the 1st trip DTC did not recur, the 1st trip DTC will not be displayed.

If a malfunction is detected during the 1st trip, the 1st trip DTC is saved in the ECM memory. The MIL will not illuminate (two trip detection logic). If the same malfunction is not detected in the 2nd trip (meeting the required driving pattern), the 1st trip DTC is cleared from the ECM memory. If the same malfunction is detected in the 2nd trip, both the 1st trip DTC and DTC are stored in the ECM memory and the MIL illuminates. In other words, the DTC is stored in the ECM memory and the MIL illuminates when the same malfunction occurs in two consecutive trips. If a 1st trip DTC is saved and a non-diagnostic operation is performed between the 1st and 2nd trips, only the 1st trip DTC will continue to be stored. For malfunctions that blink or illuminate the MIL during the 1st trip, the DTC and 1st trip DTC are stored in the ECM memory.

Procedures for clearing the DTC and the 1st trip DTC from the ECM memory are described in "How to Erase DTC and 1st Trip DTC.

For malfunctions in which 1st trip DTCs are displayed, refer to <u>EC-1172</u>, <u>"DTC Index"</u>. These items are required by legal regulations to continuously monitor the system/component. In addition, the items monitored non-continuously are also displayed on CONSULT-III.

1st trip DTC is specified in Service \$07 of SAE J1979. 1st trip DTC detection occurs without illuminating the MIL and therefore does not warn the driver of a malfunction. However, 1st trip DTC detection will not prevent the vehicle from being tested, for example during Inspection/Maintenance (I/M) tests.

When a 1st trip DTC is detected, check, print out or write down and erase (1st trip) DTC and Freeze Frame data as specified in Work Flow procedure Step 2, refer to EC-573, "Work Flow". Then perform DTC CONFIRMATION PROCEDURE or Component Function Check to try to duplicate the malfunction. If the malfunction is duplicated, the item requires repair.

Freeze Frame Data and 1st Trip Freeze Frame Data

The ECM records the driving conditions such as fuel system status, calculated load value, engine coolant temperature, short-term fuel trim, long-term fuel trim, engine speed, vehicle speed, absolute throttle position, base fuel schedule and intake air temperature at the moment a malfunction is detected.

Data which are stored in the ECM memory, along with the 1st trip DTC, are called 1st trip freeze frame data. The data, stored together with the DTC data, are called freeze frame data and displayed on CONSULT-III or GST. The 1st trip freeze frame data can only be displayed on the CONSULT-III screen, not on the GST.

Only one set of freeze frame data (either 1st trip freeze frame data or freeze frame data) can be stored in the ECM. 1st trip freeze frame data is stored in the ECM memory along with the 1st trip DTC. There is no priority for 1st trip freeze frame data and it is updated each time a different 1st trip DTC is detected. However, once freeze frame data (2nd trip detection/MIL on) is stored in the ECM memory, 1st trip freeze frame data is no longer stored. Remember, only one set of freeze frame data can be stored in the ECM. The ECM has the following priorities to update the data.

Priority	Items				
1	Freeze frame data	Misfire — DTC: P0300 - P0308 Fuel Injection System Function — DTC: P0171, P0172, P0174, P0175			
2		Except the above items (Includes A/T related items)			
3	1st trip freeze frame da	ata			

For example, the EGR malfunction (Priority: 2) was detected and the freeze frame data was saved in the 2nd trip. After that when the misfire (Priority: 1) is detected in another trip, the freeze frame data will be updated from the EGR malfunction to the misfire. The 1st trip freeze frame data is updated each time a different malfunction is detected. There is no priority for 1st trip freeze frame data. However, once freeze frame data is stored in the ECM memory, 1st trip freeze data is no longer stored (because only one freeze frame data or 1st trip freeze frame data can be stored in the ECM). If freeze frame data is stored in the ECM memory and freeze frame data with the same priority occurs later, the first (original) freeze frame data remains unchanged in the ECM memory.

Both 1st trip freeze frame data and freeze frame data (along with the DTCs) are cleared when the ECM memory is erased. Procedures for clearing the ECM memory are described in "How to Erase DTC and 1st Trip DTC".

How to Read DTC and 1st Trip DTC

DTC and 1st trip DTC can be read by the following methods.

(P) With CONSULT-III

CONSULT-III displays the DTC in "SELF DIAGNOSTIC RESULT" mode. Examples: P0340, P0850, P1148, etc.

Revision: 2009 March **EC-707** 2009 FX35/FX50

EC

C

D

Е

F

G

Н

V

0

P

< SYSTEM DESCRIPTION > [VK50VE]

These DTCs are prescribed by SAE J2012.

(CONSULT-III also displays the malfunctioning component or system.)

Time data indicates how many times the vehicle was driven after the last detection of a DTC.

If the DTC is being detected currently, the time data will be [0].

If a 1st trip DTC is stored in the ECM, the time data will be [1t].

With GST

GST (Generic Scan Tool) displays the DTC in Diagnostic Service \$03. Examples: P0340, P0850, P1148, etc. These DTCs are prescribed by SAE J2012.

1st trip DTC is displayed in Diagnostic Service \$07.

No Tools

The number of blinks of the MIL in the Diagnostic Test Mode II (Self-Diagnostic Results) indicates the DTC. Example: 0340, 0850, 1148, etc.

These DTCs are controlled by NISSAN.

NOTE:

- 1st trip DTC No. is the same as DTC No.
- Output of a DTC indicates a malfunction. However, GST and the Diagnostic Test Mode II do not indicate whether the malfunction is still occurring or has occurred in the past and has returned to normal. CONSULT-III can identify malfunction status. Therefore, using CONSULT-III (if available) is recommended.

How to Erase DTC and 1st Trip DTC

(P) With CONSULT-III

NOTE:

- If the ignition switch stays ON after repair work, be sure to turn ignition OFF once. Wait at least 10 seconds and then turn it ON (engine stopped) again.
- If the DTC is not for A/T related items (see EC-1172, "DTC Index"), skip step 1.
- Erase DTC in TCM. Refer to <u>TM-263, "Diagnosis Description"</u>.
- 2. Select "ENGINE" with CONSULT-III.
- Select "SELF-DIAG RESULTS".
- 4. Touch "ERASE". (DTC in ECM will be erased.)
- With GST

NOTE:

- If the ignition switch stays ON after repair work, be sure to turn ignition OFF once. Wait at least 10 seconds and then turn it ON (engine stopped) again.
- Select Diagnostic Service \$04 with GST (Generic Scan Tool).

No Tools

NOTE:

• If the ignition switch stays ON after repair work, be sure to turn ignition switch OFF once.

Wait at least 10 seconds and then turn it ON (engine stopped) again.

 Erase DTC in ECM. Refer to How To ERASE DIAGNOSTIC TEST MODE II (SELF-DIAGNOSTIC RESULTS).

NOTE:

- If the battery is disconnected, the emission-related diagnostic information will be cleared within 24 hours.
- The following data are cleared when the ECM memory is erased.
- Diagnostic trouble codes
- 1st trip diagnostic trouble codes
- Freeze frame data
- 1st trip freeze frame data
- System readiness test (SRT) codes
- Test values
- Actual work procedures are explained using a DTC as an example. Be careful so that not only the DTC, but all of the data listed above, are cleared from the ECM memory during work procedures.

SYSTEM READINESS TEST (SRT) CODE

System Readiness Test (SRT) code is specified in Service \$01 of SAE J1979.

As part of an enhanced emissions test for Inspection & Maintenance (I/M), certain states require the status of SRT be used to indicate whether the ECM has completed self-diagnosis of major emission systems and components. Completion must be verified in order for the emissions inspection to proceed.

< SYSTEM DESCRIPTION >

[VK50VE]

If a vehicle is rejected for a State emissions inspection due to one or more SRT items indicating "INCMP", use the information in this Service Manual to set the SRT to "CMPLT".

In most cases the ECM will automatically complete its self-diagnosis cycle during normal usage, and the SRT status will indicate "CMPLT" for each application system. Once set as "CMPLT", the SRT status remains "CMPLT" until the self-diagnosis memory is erased.

Occasionally, certain portions of the self-diagnostic test may not be completed as a result of the customer's normal driving pattern; the SRT will indicate "INCMP" for these items.

NOTE:

The SRT will also indicate "INCMP" if the self-diagnosis memory is erased for any reason or if the ECM memory power supply is interrupted for several hours.

If, during the state emissions inspection, the SRT indicates "CMPLT" for all test items, the inspector will continue with the emissions test. However, if the SRT indicates "INCMP" for one or more of the SRT items the vehicle is returned to the customer untested.

NOTE:

If MIL is ON during the state emissions inspection, the vehicle is also returned to the customer untested even though the SRT indicates "CMPLT" for all test items. Therefore, it is important to check SRT ("CMPLT") and DTC (No DTCs) before the inspection.

SRT Item

The table below shows required self-diagnostic items to set the SRT to "CMPLT".

SRT item (CONSULT-III indication)	Performance Priority*	Required self-diagnostic items to set the SRT to "CMPLT"	Corresponding DTC No.
CATALYST	2	Three way catalyst function	P0420, P0430
EVAP SYSTEM	2	EVAP control system purge flow monitoring	P0441
	1	EVAP control system	P0442
2		EVAP control system	P0456
HO2S	2	Air fuel ratio (A/F) sensor 1	P0133, P0153
		Heated oxygen sensor 2	P0137, P0157
		Heated oxygen sensor 2	P0138, P0158
		Heated oxygen sensor 2	P0139, P0159

^{*:} If completion of several SRTs is required, perform driving patterns (DTC confirmation procedure), one by one based on the priority for models with CONSULT-III.

SRT Set Timing

SRT is set as "CMPLT" after self-diagnosis has been performed one or more times. Completion of SRT is done regardless of whether the result is OK or NG. The set timing is different between OK and NG results and is shown in the table below.

		Example						
Self-diagn	osis result	Diagnosis	iagnosis $ \begin{array}{c} \text{Ignition cycle} \\ \leftarrow \text{ON} \rightarrow \text{ OFF } \leftarrow \text{ON} \rightarrow \text{ OFF } \leftarrow \text{ON} \\ \end{array} $					
All OK	Case 1	P0400	OK (1)	—(1)	OK (2)	— (2)		
		P0402	OK (1)	— (1)	— (1)	OK (2)		
		P1402	OK (1)	OK (2)	— (2)	— (2)		
		SRT of EGR	"CMPLT"	"CMPLT"	"CMPLT"	"CMPLT"		
	Case 2	P0400	OK (1)	—(1)	— (1)	— (1)		
		P0402	— (0)	— (0)	OK (1)	— (1)		
		P1402	OK (1)	OK (2)	— (2)	— (2)		
		SRT of EGR	"INCMP"	"INCMP"	"CMPLT"	"CMPLT"		

Revision: 2009 March **EC-709** 2009 FX35/FX50

EC

D

Е

F

G

ı

J

K

N /I

Ν

0

< SYSTEM DESCRIPTION >

[VK50VE]

			Example						
Self-diagn	osis result	Diagnosis	Ignition cycle \leftarrow ON \rightarrow OFF \leftarrow ON \rightarrow OFF \leftarrow ON \rightarrow						
NG exists	Case 3	P0400	OK	OK	_	_			
		P0402	_	_	_	_			
		P1402	NG	_	NG	NG (Consecutive NG)			
		(1st trip) DTC	1st trip DTC	_	1st trip DTC	DTC (= MIL ON)			
		SRT of EGR	"INCMP"	"INCMP"	"INCMP"	"CMPLT"			

OK: Self-diagnosis is carried out and the result is OK.

NG: Self-diagnosis is carried out and the result is NG.

When all SRT related self-diagnoses show OK results in a single cycle (Ignition OFF-ON-OFF), the SRT will indicate "CMPLT". → Case 1 above

When all SRT related self-diagnoses show OK results through several different cycles, the SRT will indicate "CMPLT" at the time the respective self-diagnoses have at least one OK result. → Case 2 above

If one or more SRT related self-diagnoses show NG results in 2 consecutive cycles, the SRT will also indicate "CMPLT". \rightarrow Case 3 above

The table above shows that the minimum number of cycles for setting SRT as "INCMP" is the number one (1) for each self-diagnosis (Case 1 & 2) or the number two (2) for one of self-diagnoses (Case 3). However, in preparation for the state emissions inspection, it is unnecessary for each self-diagnosis to be executed twice (Case 3) for the following reasons:

- The SRT will indicate "CMPLT" at the time the respective self-diagnoses have one (1) OK result.
- The emissions inspection requires "CMPLT" of the SRT only with OK self-diagnosis results.
- During SRT driving pattern, the 1st trip DTC (NG) is detected prior to "CMPLT" of SRT and the self-diagnosis memory must be erased from the ECM after repair.
- If the 1st trip DTC is erased, all the SRT will indicate "INCMP".

NOTE:

SRT can be set as "CMPLT" together with the DTC(s). Therefore, DTC check must always be carried out prior to the state emission inspection even though the SRT indicates "CMPLT".

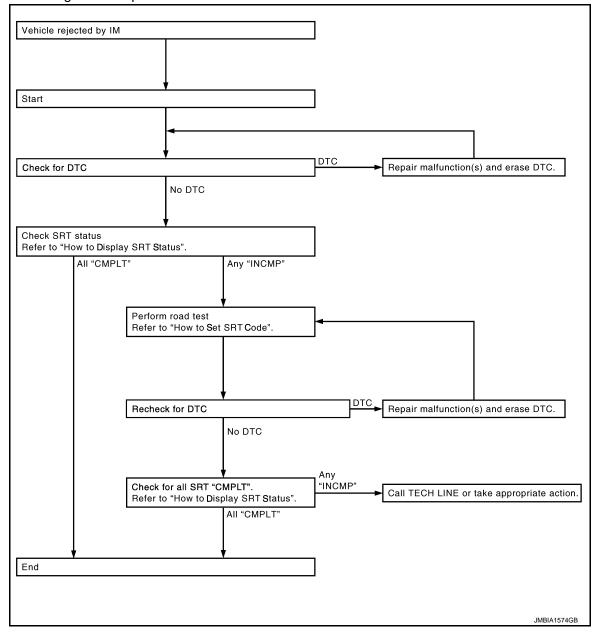
SRT Service Procedure

^{—:} Self-diagnosis is not carried out.

< SYSTEM DESCRIPTION >

[VK50VE]

If a vehicle has failed the state emissions inspection due to one or more SRT items indicating "INCMP", review the flowchart diagnostic sequence below.



How to Display SRT Status

(P) WITH CONSULT-III

Selecting "SRT STATUS" in "DTC CONFIRMATION" mode with CONSULT-III.

For items whose SRT codes are set, "CMPLT" is displayed on the CONSULT-III screen; for items whose SRT codes are not set, "INCMP" is displayed.

NOTE:

Though displayed on the CONSULT-III screen, "HO2S HTR" is not SRT item.

WITH GST

Selecting Service \$01 with GST (Generic Scan Tool)

NO TOOLS

A SRT code itself cannot be displayed, however SRT status can.

- Turn ignition switch ON and wait 20 seconds.
- SRT status is indicated as shown below.
 - When all SRT codes are set, MIL illuminates continuously.

EC-711 Revision: 2009 March 2009 FX35/FX50

EC

Α

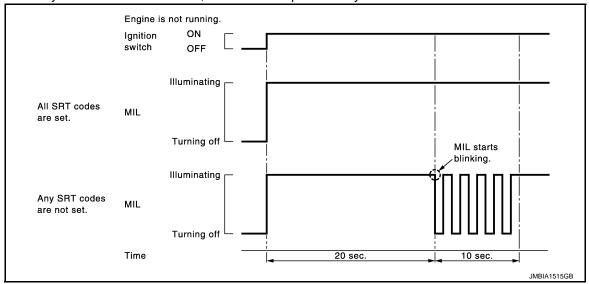
D

M

Ν

[VK50VE]

When any SRT codes are not set, MIL will blink periodically for 10 seconds.

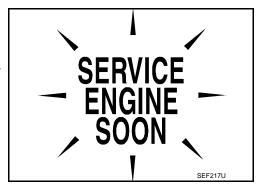


MALFUNCTION INDICATOR LAMP (MIL)

Description

The MIL is located on the combination meter.

- The MIL will illuminate when the ignition switch is turned ON without the engine running. This is a bulb check.
 If the MIL does not illuminate, check MIL circuit. Refer to EC-1113, "Component Function Check".
- 2. When the engine is started, the MIL should turn off. If the MIL remains on, the on board diagnostic system has detected an engine system malfunction.



On Board Diagnostic System Function

The on board diagnostic system has the following three functions.

< SYSTEM DESCRIPTION >

[VK50VE]

Diagnostic Test Mode	KEY and ENG. Status	Function	Explanation of Function
Mode I	Ignition switch in ON position Engine stopped	BULB CHECK	This function checks the MIL bulb for damage (blown, open circuit, etc.). If the MIL does not illuminate, check MIL circuit.
	Engine running	MALFUNCTION WARNING	When a malfunction is detected twice in two consecutive driving cycles (two trip detection logic), the MIL will illuminate to inform the driver that a malfunction has been detected. The following malfunctions will illuminate or blink the MIL in the 1st trip. • Misfire (Possible three way catalyst damage) • One trip detection diagnosis
Mode II	Ignition switch in ON position Engine stopped	SELF-DIAGNOSTIC RESULTS	This function allows DTCs and 1st trip DTCs to be read.

Diagnostic Test Mode I — Bulb Check

In this mode, the MIL on the instrument panel should stay ON. If it remains OFF, check MIL circuit. Refer to <u>EC-1113</u>, "Component Function Check".

Diagnostic Test Mode I — Malfunction Warning

MIL	Condition				
ON	When the malfunction is detected.				
OFF	No malfunction.				

The DTC number is clarified in Diagnostic Test Mode II (SELF-DIAGNOSTIC RESULTS)

Diagnostic Test Mode II — Self-diagnostic Results

In this mode, the DTC and 1st trip DTC are indicated by the number of blinks of the MIL as shown below. The DTC and 1st trip DTC are displayed at the same time. If the MIL does not illuminate in diagnostic test mode I (Malfunction warning), all displayed items are 1st trip DTCs. If only one code is displayed when the MIL illuminates in diagnostic test mode II (SELF-DIAGNOSTIC RESULTS), it is a DTC; if two or more codes are displayed, they may be either DTCs or 1st trip DTCs. DTC No. is same as that of 1st trip DTC. These unidentified codes can be identified by using the CONSULT-III or GST. A DTC will be used as an example for how to read a code.

EC

Α

D

Е

F

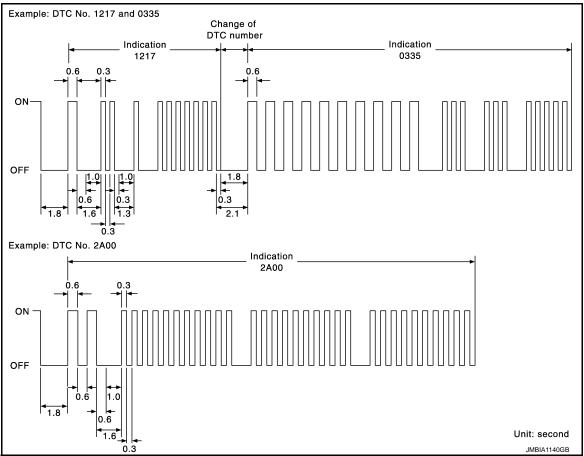
Κ

.

N

V

P



A particular trouble code can be identified by the number of four-digit numeral blinks as per the following.

Number	0	1	2	3	4	5	6	7	8	9	Α	В	С	D	Е	F
Blinks	10	1	2	3	4	5	6	7	8	9	11	12	13	14	15	16

The length of time the 1,000th-digit numeral blinks on and off is 1.2 seconds consisting of an ON (0.6-second) - OFF (0.6-second) cycle.

The 100th-digit numeral and lower digit numerals consist of a 0.3-seconds ON and 0.3-seconds OFF cycle. A change from one digit numeral to another occurs at an interval of 1.0-second OFF. In other words, the later numeral appears on the display 1.3 seconds after the former numeral has disappeared.

A change from one trouble code to another occurs at an interval of 1.8-seconds OFF.

In this way, all the detected malfunctions are classified by their DTC numbers. The DTC 0000 refers to no malfunction. (See <u>EC-1172, "DTC Index"</u>)

How to Switch Diagnostic Test Mode

NOTE:

- It is better to count the time accurately with a clock.
- It is impossible to switch the diagnostic test mode when an accelerator pedal position sensor circuit
 has a malfunction.
- ECM always returns to Diagnostic Test Mode I after the ignition switch is turned OFF.

HOW TO SET DIAGNOSTIC TEST MODE II (SELF-DIAGNOSTIC RESULTS)

- 1. Confirm that accelerator pedal is fully released, turn ignition switch ON and wait 3 seconds.
- 2. Repeat the following procedure quickly 5 times within 5 seconds.
- Fully depress the accelerator pedal.
- Fully release the accelerator pedal.
- Wait 7 seconds, fully depress the accelerator pedal and keep it depressed for approx. 10 seconds until the MIL starts blinking.

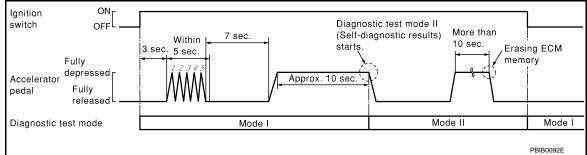
NOTE:

Do not release the accelerator pedal for 10 seconds if MIL starts blinking during this period. This blinking is displaying SRT status and is continued for another 10 seconds.

4. Fully release the accelerator pedal. ECM has entered to Diagnostic Test Mode II (Self-diagnostic results).

NOTE:

Wait until the same DTC (or 1st trip DTC) appears to completely confirm all DTCs.



HOW TO ERASE DIAGNOSTIC TEST MODE II (SELF-DIAGNOSTIC RESULTS)

- Set ECM in Diagnostic Test Mode II (Self-diagnostic results). Refer to "HOW TO SET DIAGNOSTIC TEST MODE II (SELF-DIAGNOSTIC RESULTS)".
- Fully depress the accelerator pedal and keep it depressed for more than 10 seconds. The emission-related diagnostic information has been erased from the backup memory in the ECM.
- Fully release the accelerator pedal, and confirm the DTC 0000 is displayed.
- If the battery is disconnected, the DTC will be lost from the backup memory within 24 hours.
- Do not erase the stored memory before starting trouble diagnoses.

OBD System Operation Chart

Relationship Between MIL, 1st Trip DTC, DTC, and Detectable Items

- When a malfunction is detected for the first time, the 1st trip DTC and the 1st trip freeze frame data are stored in the ECM memory.
- When the same malfunction is detected in two consecutive trips, the DTC and the freeze frame data are stored in the ECM memory, and the MIL will illuminate.
- The MIL will turn off after the vehicle is driven 3 times (driving pattern B) with no malfunction. A drive is counted only when the recorded driving pattern is met (as stored in the ECM). If another malfunction occurs while counting, the counter will reset.
- The DTC and the freeze frame data will be stored until the vehicle is driven 40 times (driving pattern A) without the same malfunction recurring (except for Misfire and Fuel Injection System). For Misfire and Fuel Injection System, the DTC and freeze frame data will be stored until the vehicle is driven 80 times (driving pattern C) without the same malfunction recurring. The "TIME" in "SELF DIAGNOSTIC RESULT" mode of CON-SULT-III will count the number of times the vehicle is driven.
- The 1st trip DTC is not displayed when the self-diagnosis results in OK for the 2nd trip.

Summary Chart

Items	Fuel Injection System	Misfire	Other		
MIL (turns off)	3 (pattern B)	3 (pattern B)	3 (pattern B)		
DTC, Freeze Frame Data (no display)	80 (pattern C)	80 (pattern C)	40 (pattern A)		
1st Trip DTC (clear)	1 (pattern C)*1	1 (pattern C)*1	1 (pattern B)		
1st Trip Freeze Frame Data (clear)	*1, *2	*1, *2	1 (pattern B)		

For details about patterns B and C under "Fuel Injection System" and "Misfire", see "EXPLANATION FOR DRIVING PATTERNS FOR "MISFIRE <EXHAUST QUALITY DETERIORATION>", "FUEL INJECTION SYSTEM".

For details about patterns A and B under Other, see "EXPLANATION FOR DRIVING PATTERNS FOR "MISFIRE <EXHAUST QUALITY DETERIORATION>", "FUEL INJECTION SYSTEM".

*1: Clear timing is at the moment OK is detected.

*2: Clear timing is when the same malfunction is detected in the 2nd trip.

Relationship Between MIL, DTC, 1st Trip DTC and Driving Patterns for "Misfire <Exhaust Quality Deterioration>", "Fuel Injection System"

EC

Α

D

Е

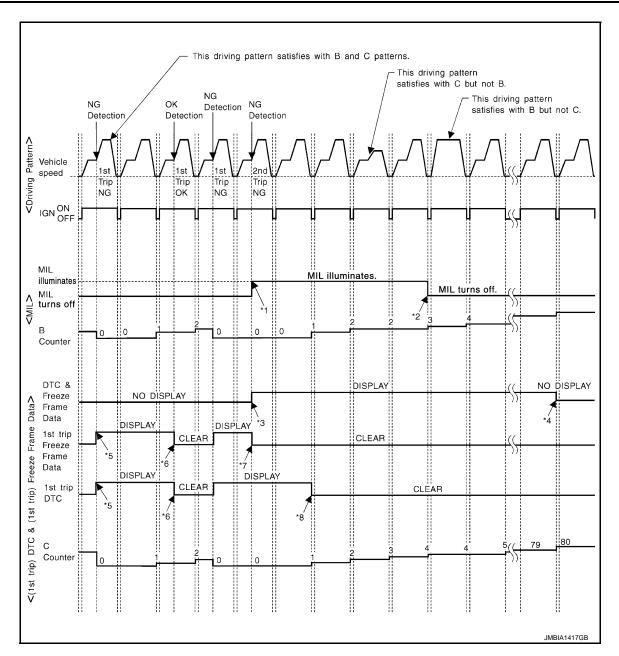
F

K

N

Р

EC-715 Revision: 2009 March 2009 FX35/FX50



- *1: When the same malfunction is detected in two consecutive trips, MIL will illuminate.
- *4: The DTC and the freeze frame data will not be displayed any longer after vehicle is driven 80 times (pattern C) without the same malfunction. (The DTC and the freeze frame data still remain in ECM.)
- *7: When the same malfunction is detected in the 2nd trip, the 1st trip freeze frame data will be cleared.

- *2: MIL will turn off after vehicle is driven 3 times (pattern B) without any malfunctions.
- *5: When a malfunction is detected for the first time, the 1st trip DTC and the 1st trip freeze frame data will be stored in ECM.
- *8: 1st trip DTC will be cleared when vehicle is driven once (pattern C) without the same malfunction after DTC is stored in ECM.
- *3: When the same malfunction is detected in two consecutive trips, the DTC and the freeze frame data will be stored in ECM.
- *6: The 1st trip DTC and the 1st trip freeze frame data will be cleared at the moment OK is detected.

Explanation for Driving Patterns for "Misfire <Exhaust Quality Deterioration>", "Fuel Injection System" <Driving Pattern B>

Driving pattern B means the vehicle operation as per the following:

All components and systems should be monitored at least once by the OBD system.

< SYSTEM DESCRIPTION > [VK50VE]

The B counter will be cleared when the malfunction is detected once regardless of the driving pattern.

- The B counter will be counted up when driving pattern B is satisfied without any malfunction.
- The B counter will be counted up when unvilly patient B is satisfied without any maintriction.
- The MIL will turn off when the B counter reaches 3. (*2 in "OBD SYSTEM OPERATION CHART")

<Driving Pattern C>

Driving pattern C means operating vehicle as per the following:

The following conditions should be satisfied at the same time:

Engine speed: (Engine speed in the freeze frame data) \pm 375 rpm

Calculated load value: (Calculated load value in the freeze frame data) x (1 ± 0.1) [%]

Engine coolant temperature (T) condition:

- When the freeze frame data shows lower than 70°C (158°F), T should be lower than 70°C (158°F).
- When the freeze frame data shows higher than or equal to 70°C (158°F), T should be higher than or equal to 70°C (158°F).

Example:

If the stored freeze frame data is as per the following:

Engine speed: 850 rpm, Calculated load value: 30%, Engine coolant temperature: 80°C (176°F)

To be satisfied with driving pattern C, the vehicle should run under the following conditions:

Engine speed: 475 - 1,225 rpm, Calculated load value: 27 - 33%, Engine coolant temperature: more than 70°C (158°F)

- The C counter will be cleared when the malfunction is detected regardless of vehicle conditions above.
- The C counter will be counted up when vehicle conditions above are satisfied without the same malfunction.
- The DTC will not be displayed after C counter reaches 80.
- The 1st trip DTC will be cleared when C counter is counted once without the same malfunction after DTC is stored in ECM.

Relationship Between MIL, DTC, 1st Trip DTC and Driving Patterns Except For "Misfire <Exhaust Quality Deterioration>", "Fuel Injection System"

EC

Α

D

Е

G

Н

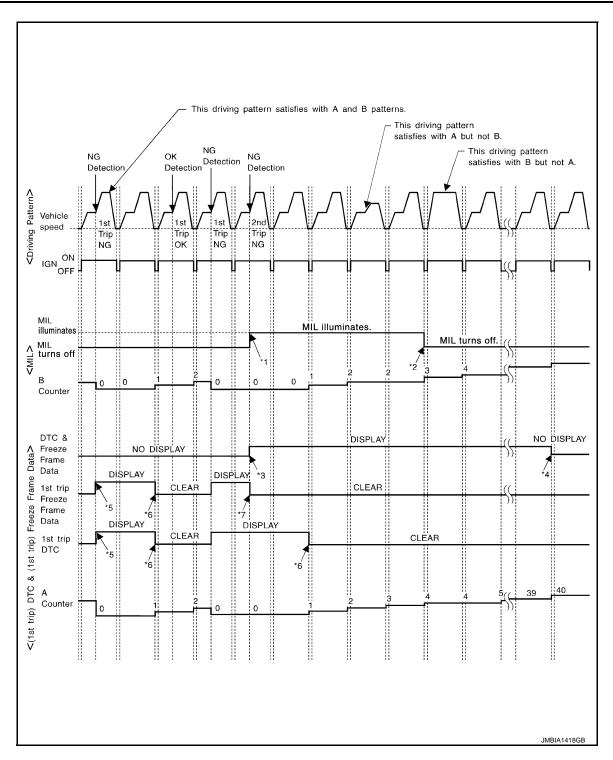
Κ

L

M

Ν

O



- *1: When the same malfunction is detected in two consecutive trips, MIL will illuminate.
- 3 times (pattern B) without any malfunctions.
- *2: MIL will turn off after vehicle is driven *3: When the same malfunction is detected in two consecutive trips, the DTC and the freeze frame data will be stored in ECM.

< SYSTEM DESCRIPTION >

[VK50VE]

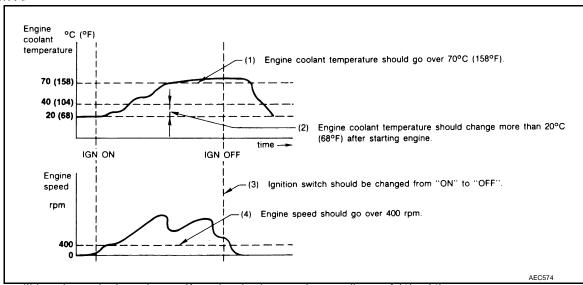
- *4: The DTC and the freeze frame data will not be displayed any longer after vehicle is driven 40 times (pattern A) without the same malfunction. (The DTC and the freeze frame data still remain in ECM.)
- *5: When a malfunction is detected for the first time, the 1st trip DTC and the 1st trip freeze frame data will be stored in ECM.
- *6: 1st trip DTC will be cleared after vehicle is driven once (pattern B) without the same malfunction.

EC

Α

*7: When the same malfunction is detected in the 2nd trip, the 1st trip freeze frame data will be cleared.

Explanation for Driving Patterns Except for "Misfire < Exhaust Quality Deterioration>", "Fuel Injection System" <Driving Pattern A>



- The A counter will be cleared when the malfunction is detected regardless of (1) (4).
- The A counter will be counted up when (1) (4) are satisfied without the same malfunction.
- The DTC will not be displayed after the A counter reaches 40.

<Driving Pattern B>

Driving pattern B means operating vehicle as per following:

All components and systems should be monitored at least once by the OBD system.

- The B counter will be cleared when the malfunction is detected once regardless of the driving pattern.
- The B counter will be counted up when driving pattern B is satisfied without any malfunctions.
- The MIL will turn off when the B counter reaches 3 (*2 in OBD SYSTEM OPERATION CHART).

CONSULT-III Function

INFOID:0000000003958672

FUNCTION

Diagnostic test mode	Function
ECU Identification	ECM part number can be read.
Self Diagnostic Result	Self-diagnostic results such as 1st trip DTC, DTC and 1st trip freeze frame data or freeze frame data can be read and erased quickly.*
Data Monitor	Input/Output data in the ECM can be read.
Active Test	Diagnostic Test Mode in which CONSULT-III drives some actuators apart from the ECM and also shifts some parameters in a specified range.
Function Test	This mode is used to inform customers when the vehicle conditions require periodic maintenance.
Work Support	This mode enables a technician to adjust some devices faster and more accurately by following the indications on the CONSULT-III screen.
DTC & SRT Confirmation	The status of system monitoring tests and the self-diagnosis status/results can be confirmed.

^{*:} The following emission-related diagnostic information is cleared when the ECM memory is erased.

- Diagnostic trouble codes
- · 1st trip diagnostic trouble codes
- · Freeze frame data

EC-719 Revision: 2009 March 2009 FX35/FX50

D

Е

K

N

[VK50VE]

< SYSTEM DESCRIPTION >

- 1st trip freeze frame data
- System readiness test (SRT) codes
- Test values

ENGINE CONTROL COMPONENT PARTS/CONTROL SYSTEMS APPLICATION

		DIAGNOSTIC TEST MODE								
ltem		SELF DIAGNOSTIC RESULT		DATA MONI- TOR	ACTIVE TEST	WORK SUP- PORT	DTC & SRT CONFIRMATION			
	item	DTC*1	FREEZE FRAME DATA*2				SRT STATUS	DTC WORK SUP- PORT		
	Crankshaft position sensor	×	×	×						
	Camshaft position sensor	×	×	×						
	Mass air flow sensor	×		×						
	Engine coolant temperature sensor	×	×	×	×					
	Engine oil temperature sensor	×		×						
	Air fuel ratio (A/F) sensor 1	×		×			×	×		
	Heated oxygen sensor 2	×		×			×	×		
	Vehicle speed signal	×	×	×						
	Accelerator pedal position sensor	×		×						
	Throttle position sensor	×	×	×						
	Fuel tank temperature sensor	×		×	×					
2	EVAP control system pressure sensor	×		×						
₹	Intake air temperature sensor	×	×	×						
	Knock sensor	×								
5	Refrigerant pressure sensor			×						
ENGINE CONTROL COMPONENT PARTS INPUT	Closed throttle position switch (accelerator pedal position sensor signal)			×						
5 €	Air conditioner switch			×						
= =	Park/neutral position (PNP) signal	×		×						
3	Stop lamp switch	×		×						
	Power steering pressure sensor	×		×						
	Battery voltage			×						
	Load signal			×						
	Exhaust valve timing control position sensor	×		×						
	Fuel level sensor	×		×						
	Battery current sensor	×		×						
	ASCD steering switch	×		×						
	ICC steering switch	×		×						
	ASCD brake switch	×		×						
	ICC brake switch	×		×						
	Snow mode switch			×						
	VVEL control shaft position sensor	×		×						

EC-720 Revision: 2009 March 2009 FX35/FX50

< SYSTEM DESCRIPTION >

[VK50VE]

		DIAGNOSTIC TEST MODE						
	ltem	-	AGNOSTIC SULT	DATA MONI- TOR	ACTIVE TEST	WORK SUP- PORT	DTC 8	
	пеш	DTC*1	FREEZE FRAME DATA*2				SRT STATUS	DTC WORK SUP- PORT
	Fuel injector			×	×			
	Power transistor (Ignition timing)			×	×			
	Throttle control motor relay	×		×				
	Throttle control motor	×						
OUTPUT	EVAP canister purge volume control sole- noid valve	×		×	×			×
:	Air conditioner relay			×				
į	Fuel pump control module (FPCM)	×		×		×		
2	Cooling fan relay	×		×	×			
OUTPUT	Air fuel ratio (A/F) sensor 1 heater	×		×			×* ³	
	Heated oxygen sensor 2 heater	×		×			×* ³	
	EVAP canister vent control valve	×		×	×	×		
3	Intake valve timing control solenoid valve	×		×	×			
	Alternator			×	×			
	Exhaust valve timing control solenoid valve	×		×	×			
	VVEL actuator motor	×						
	VVEL actuator motor relay	×						
	Alternator			×	×			
	Calculated load value		×	×				

^{×:} Applicable

SELF DIAGNOSTIC RESULT MODE

Self Diagnostic Item

Regarding items of DTC and 1st trip DTC, refer to EC-1172, "DTC Index".

Freeze Frame Data and 1st Trip Freeze Frame Data

Freeze frame data item*	Description
DIAG TROUBLE CODE [PXXXX]	The engine control component part/control system has a trouble code that is displayed as PXXXX. (Refer to EC-1172, "DTC_Index".)
CAL/LD VALUE [%]	The calculated load value at the moment a malfunction is detected is displayed.
COOLANT TEMP [°C] or [°F]	The engine coolant temperature at the moment a malfunction is detected is displayed.
L-FUEL TRM-B1 [%]	"Long-term fuel trim" at the moment a malfunction is detected is displayed.
L-FUEL TRM-B2 [%]	 The "long-term fuel trim" indicates much more gradual feedback compensation to the base fuel schedule than "short-term fuel trim".
S-FUEL TRM-B1 [%]	"Short-term fuel trim" at the moment a malfunction is detected is displayed.
S-FUEL TRM-B2 [%]	 The "short-term fuel trim" indicates dynamic or instantaneous feedback compensation to the base fuel schedule.
ENGINE SPEED [rpm]	The engine speed at the moment a malfunction is detected is displayed.

EC-721 Revision: 2009 March 2009 FX35/FX50

Α

D

Е

L

Ν

Р

^{*1:} This item includes 1st trip DTCs.

^{*2:} This mode includes 1st trip freeze frame data or freeze frame data. The items appear on CONSULT-III screen in freeze frame data mode only if a 1st trip DTC or DTC is detected. For details, refer to EC-706, "Diagnosis Description".

^{*3:} Always "CMPLT" is displayed.

< SYSTEM DESCRIPTION >

[VK50VE]

Freeze frame data item*	Description
VEHICL SPEED [km/h] or [mph]	The vehicle speed at the moment a malfunction is detected is displayed.
ABSOL TH-P/S [%]	The throttle valve opening angle at the moment a malfunction is detected is displayed.
B/FUEL SCHDL [msec]	The base fuel schedule at the moment a malfunction is detected is displayed.
INT/A TEMP SE [°C] or [°F]	The intake air temperature at the moment a malfunction is detected is displayed.
FUEL SYS-B1	"Fuel injection system status" at the moment a malfunction is detected is displayed.
FUEL SYS-B2	One of the following mode is displayed. Mode2: Open loop due to detected system malfunction Mode3: Open loop due to driving conditions (power enrichment, deceleration enleanment) Mode4: Closed loop - using oxygen sensor(s) as feedback for fuel control Mode5: Open loop - has not yet satisfied condition to go to closed loop
INT MANI PRES [kPa]	These items are displayed but are not applicable to this model.
COMBUST CONDITION	These items are displayed but are not applicable to this model.

^{*:} The items are the same as those of 1st trip freeze frame data.

DATA MONITOR MODE

Monitored Item

×: Applicable

Monitored item	Unit	Description	Remarks	
ENG SPEED	rpm	Indicates the engine speed computed from the signal of the crankshaft position sensor and camshaft position sensor.	 Accuracy becomes poor if engine speed drops below the idle rpm. If the signal is interrupted while the engine is running, an abnormal value may be indicated. 	
MAS A/F SE-B1			When the engine is stopped, a certain	
MAS A/F SE-B2	V	The signal voltage of the mass air flow sensor is displayed.	value is indicated.When engine is running, specification range is indicated in "SPEC".	
B/FUEL SCHDL	msec	"Base fuel schedule" indicates the fuel injection pulse width programmed into ECM, prior to any learned on board correction.	When engine is running, specification range is indicated in "SPEC".	
A/F ALPHA-B1			When the engine is stopped, a certain	
A/F ALPHA-B2	%	The mean value of the air-fuel ratio feedback cor- rection factor per cycle is indicated.	 value is indicated. This data also includes the data for the air-fuel ratio learning control. When engine is running, specification range is indicated in "SPEC". 	
COOLAN TEMP/S	°C or °F	The engine coolant temperature (determined by the signal voltage of the engine coolant tempera- ture sensor) is displayed.	When the engine coolant temperature sensor is open or short-circuited, ECM enters fail-safe mode. The en- gine coolant temperature determined by the ECM is displayed.	
A/F SEN1 (B1)	V	The A/F signal computed from the input signal of		
A/F SEN1 (B2)	V	the air fuel ratio (A/F) sensor 1 is displayed.		
HO2S2 (B1)	V	The signal voltage of the heated oxygen sensor 2		
HO2S2 (B2)	V	is displayed.		
HO2S2 MNTR (B1)		Display of heated oxygen sensor 2 signal:		
HO2S2 MNTR (B2)	RICH/LEAN	RICH: means the amount of oxygen after three way catalyst is relatively small. LEAN: means the amount of oxygen after three way catalyst is relatively large.	When the engine is stopped, a certain value is indicated.	
VHCL SPEED SE	km/h or mph	The vehicle speed computed from the vehicle speed signal sent from unified meter and A/C amp. is displayed.		

< SYSTEM DESCRIPTION >

[VK50VE]

Monitored item Unit De		Description	Remarks	
BATTERY VOLT	V	The power supply voltage of ECM is displayed.		
ACCEL SEN 1	V	The accelerator pedal position sensor signal voltage is displayed.	ACCEL SEN 2 signal is converted by ECM internally. Thus, they differs	
ACCEL SEN 2 TP SEN 1-B1		The throttle position sensor signal voltage is dis-	from ECM terminal voltage signal. TP SEN 2-B1 signal is converted by	
TP SEN 2-B1	V	played.	ECM internally. Thus, they differs from ECM terminal voltage signal.	
FUEL T/TMP SE	°C or °F	The fuel temperature (determined by the signal voltage of the fuel tank temperature sensor) is displayed.		
EVAP SYS PRES	V	The signal voltage of EVAP control system pressure sensor is displayed.		
FUEL LEVEL SE	V	The signal voltage of the fuel level sensor is displayed.		
START SIGNAL	ON/OFF	Indicates start signal status [ON/OFF] computed by the ECM according to the signals of engine speed and battery voltage.	After starting the engine, [OFF] is displayed regardless of the starter signal.	
CLSD THL POS	ON/OFF	Indicates idle position [ON/OFF] computed by ECM according to the accelerator pedal position sensor signal.		
AIR COND SIG	ON/OFF	Indicates [ON/OFF] condition of the air conditioner sig- er switch as determined by the air conditioner sig- nal.		
PW/ST SIGNAL	ON/OFF	[ON/OFF] condition of the power steering system (determined by the signal voltage of the power steering pressure sensor signal) is indicated.		
LOAD SIGNAL	ON/OFF	Indicates [ON/OFF] condition from the electrical load signal. ON: Rear window defogger switch is ON and/or lighting switch is in 2nd position. OFF: Both rear window defogger switch and lighting switch are OFF.		
GNITION SW	ON/OFF	Indicates [ON/OFF] condition from ignition switch signal.		
HEATER FAN SW	ON/OFF	Indicates [ON/OFF] condition from the heater fan switch signal.		
BRAKE SW	ON/OFF	Indicates [ON/OFF] condition from the stop lamp switch signal.		
NJ PULSE-B1 NJ PULSE-B2	msec	Indicates the actual fuel injection pulse width compensated by ECM according to the input sig- nals.	When the engine is stopped, a certain computed value is indicated.	
GN TIMING	BTDC	Indicates the ignition timing computed by ECM according to the input signals.	When the engine is stopped, a certain value is indicated.	
CAL/LD VALUE	%	"Calculated load value" indicates the value of the current air flow divided by peak air flow.		
MASS AIRFLOW	g·m/s	Indicates the mass air flow computed by ECM according to the signal voltage of the mass air flow sensor.		
PURG VOL C/V	%	 Indicates the EVAP canister purge volume control solenoid valve control value computed by the ECM according to the input signals. The opening becomes larger as the value increases. 		
EXH/V TIM B1	004	Indicates [COA] of a shared a second of		
EXH/V TIM B2	°CA	Indicates [°CA] of exhaust camshaft retard angle.		

Revision: 2009 March **EC-723** 2009 FX35/FX50

< SYSTEM DESCRIPTION >

[VK50VE]

Monitored item	Unit	Description	Remarks
INT/V SOL (B1) INT/V SOL (B2)	%	 The control value of the intake valve timing control solenoid valve (determined by ECM according to the input signals) is indicated. The advance angle becomes larger as the value increases. 	
AIR COND RLY	ON/OFF	The air conditioner relay control condition (determined by ECM according to the input signals) is indicated.	
VENT CONT/V	ON/OFF	The control condition of the EVAP canister vent control valve (determined by ECM according to the input signals) is indicated. ON: Closed OFF: Open	
THRTL RELAY	ON/OFF	Indicates the throttle control motor relay control condition determined by the ECM according to the input signals.	
A/F S1 HTR (B1)		Air fuel ratio (A/F) sensor 1 heater control value	
A/F S1 HTR (B2)	%	 computed by ECM according to the input signals. The current flow to the heater becomes larger as the value increases. 	
HO2S2 HTR (B1)	011/055	Indicates [ON/OFF] condition of heated oxygen	
HO2S2 HTR (B2)	ON/OFF	sensor 2 heater determined by ECM according to the input signals.	
ALT DUTY SIG	ON/OFF	The control condition of the power generation voltage variable control (determined by ECM according to the input signals) is indicated. ON: Power generation voltage variable control is active. OFF: Power generation voltage variable control is inactive.	
I/P PULLY SPD	rpm	Indicates the engine speed computed from the in- put speed sensor signal.	
VEHICLE SPEED	km/h or mph	The vehicle speed computed from the vehicle speed signal sent from TCM is displayed.	
IDL A/V LEARN	YET/CMPLT	Displays the condition of Idle Air Volume Learning YET: Idle air volume learning has not been performed yet. CMPLT: Idle air volume learning has already been performed successfully.	
TRVL AFTER MIL	km or mile	Distance traveled while MIL is activated.	
SNOW MODE SW	ON/OFF	Indicates [ON/OFF] condition from the snow mode switch signal.	
ENG OIL TEMP	°C or °F	The engine oil temperature (determined by the signal voltage of the engine oil temperature sen- sor) is displayed.	
VHCL SPEED SE	km/h or mph	The vehicle speed computed from the vehicle speed signal sent from unified meter and A/C amp. is displayed.	
SET VHCL SPD	km/h or mph	The preset vehicle speed is displayed.	
MAIN SW	ON/OFF	Indicates [ON/OFF] condition from MAIN switch signal.	
CANCEL SW	ON/OFF	Indicates [ON/OFF] condition from CANCEL switch signal.	
RESUME/ACC SW	ON/OFF	Indicates [ON/OFF] condition from RESUME/AC- CELERATE switch signal.	

< SYSTEM DESCRIPTION >

[VK50VE]

Monitored item	Unit	Description	Remarks
SET SW	ON/OFF	Indicates [ON/OFF] condition from SET/COAST switch signal.	
BRAKE SW1	ON/OFF	Indicates [ON/OFF] condition from ASCD brake switch signal.	
BRAKE SW2	ON/OFF	Indicates [ON/OFF] condition of stop lamp switch signal.	
DIST SW	ON/OFF	Indicates [ON/OFF] condition from DISTANCE switch signal.	
VHCL SPD CUT	NON/CUT	Indicates the vehicle cruise condition. NON: Vehicle speed is maintained at the ASCD set speed. CUT: Vehicle speed decreased to excessively low compared with the ASCD set speed, and ASCD operation is cut off.	
LO SPEED CUT	NON/CUT	Indicates the vehicle cruise condition. NON: Vehicle speed is maintained at the ASCD set speed. CUT: Vehicle speed decreased to excessively low, and ASCD operation is cut off.	
AT OD MONITOR	ON/OFF	Indicates [ON/OFF] condition of A/T O/D according to the input signal from the TCM.	
AT OD CANCEL	ON/OFF	Indicates [ON/OFF] condition of A/T O/D cancel request signal.	
CRUISE LAMP	ON/OFF	Indicates [ON/OFF] condition of CRUISE indicator determined by the ECM according to the input signals.	
SET LAMP	ON/OFF	Indicates [ON/OFF] condition of SET indicator determined by the ECM according to the input signals.	
EXH V/T LEARN	YET/CMPLT	Display the condition of Exhaust Valve Timing Control Learning YET: Exhaust Valve Timing Control Learning has not been performed yet. CMPLT: Exhaust Valve Timing Control Learning has already been performed successfully.	
FAN DUTY	%	Indicates a command value for cooling fan. The value is calculated by ECM based on input signals.	
AC EVA TEMP	°C or °F	Indicates A/C evaporator temperature sent from "unified meter and A/C amp.".	
AC EVA TARGET	°C or °F	Indicates target A/C evaporator temperature sent from "unified meter and A/C amp.".	
ALT DUTY	%	Indicates the duty ratio of the power generation command value. The ratio is calculated by ECM based on the battery current sensor signal.	
BAT CUR SEN	mV	The signal voltage of battery current sensor is displayed.	
A/F ADJ-B1 A/F ADJ-B2	_	Indicates the correction of a factor stored in ECM. The factor is calculated from the difference between the target air-fuel ratio stored in ECM and the air-fuel ratio calculated from A/F sensor 1 signal.	
TP SEN 1-B2 TP SEN 2-B2	V	The throttle position sensor signal voltage is displayed.	TP SEN 2-B2 signal is converted by ECM internally. Thus, they differs from ECM terminal voltage signal.
P/N POSI SW	ON/OFF	Indicates [ON/OFF] condition from the park/neu- tral position (PNP) signal.	

< SYSTEM DESCRIPTION >

[VK50VE]

Monitored item	Unit	Description	Remarks
INT/A TEMP SE °C or °F		The intake air temperature (determined by the signal voltage of the intake air temperature sensor) is indicated.	
AC PRESS SEN	V	The signal voltage from the refrigerant pressure sensor is displayed.	
VTC DTY EX B1		The control value of the exhaust valve timing con-	
VTC DTY EX B2	%	trol magnet retarder (determined by ECM according to the input signals) is indicated. The retard angle becomes larger as the value increases.	
INT/V TIM (B1)	°CA	Indicates [°CA] of intake camshaft advance an-	
INT/V TIM (B2)		gle.	
VVEL LEARN	YET/DONE	Display the condition of VVEL learning YET: VVEL learning has not been performed yet. DONE: VVEL learning has already been performed successfully.	
VVEL SEN LEARN- B1	V	Indicates the VVEL learning value.	
VVEL SEN LEARN- B2	V	• indicates the VVEL learning value.	
VVEL POSITION SEN-B1	.,	The VVEL control shaft position sensor signal	
VVEL POSITION SEN-B2	V	voltage is displayed.	
VVEL TIM-B1		Indicates [deq] of VVEL control shaft angle.	
VVEL TIM-B2	deg	- indicates [deg] of vvLL control shall angle.	
FPCM	HI/MID/LOW/ OFF	The control condition of the fuel pump control module (FPCM) (determined by ECM according to the input signals) is indicated.	

NOTE:

Any monitored item that does not match the vehicle being diagnosed is deleted from the display automatically.

ACTIVE TEST MODE

Test Item

TEST ITEM	CONDITION	JUDGMENT	CHECK ITEM (REMEDY)	
VENT CON- TROL/V	Ignition switch: ON (Engine stopped) Turn solenoid valve ON and OFF with the CONSULT-III and listen to operating sound.	Solenoid valve makes an operating sound.	Harness and connectors Solenoid valve	
ENG COOLANT TEMP	Engine: Return to the original non-standard condition Change the engine coolant temperature using CONSULT-III.	If malfunctioning symptom disappears, see CHECK ITEM.	Harness and connectors Engine coolant temperature sensor Fuel injector	
FUEL INJEC- TION	Engine: Return to the original non-standard condition Change the amount of fuel injection using CONSULT-III.	If malfunctioning symptom disappears, see CHECK ITEM.	Harness and connectors Fuel injector Air fuel ratio (A/F) sensor 1	
FUEL/T TEMP SEN	Change the fuel tank temperature using CONSULT-III.			

< SYSTEM DESCRIPTION >

[VK50VE]

K

TEST ITEM	CONDITION	JUDGMENT	CHECK ITEM (REMEDY)	۸
PURG VOL CONT/V	 Engine: After warming up, run engine at 1,500 rpm. Change the EVAP canister purge volume control solenoid valve opening percent using CONSULT-III. 	Engine speed changes according to the opening percent.	Harness and connectors Solenoid valve	EC
FAN DUTY CONTROL*	Ignition switch: ON Change duty ratio using CON-SULT-III.	Cooling fan speed changes.	 Harness and connectors Cooling fan motor Cooling fan relay Cooling fan control module IPDM E/R 	C
ALTERNATOR DUTY	Engine: Idle Change duty ratio using CON- SULT-III.	Battery voltage changes.	Harness and connectors IPDM E/R Alternator	E
EXH V/T ASSIGN ANGLE	Engine: Return to the original non-standard condition Change exhaust valve timing using CONSULT-III.	If malfunctioning symptom disappears, see CHECK ITEM.	Harness and connectors Exhaust valve timing control magnet retarder	F
POWER BAL- ANCE	 Engine: After warming up, idle the engine. A/C switch OFF Selector lever: P or N Cut off each injector signal one at a time using CONSULT-III. 	Engine runs rough or stops.	Harness and connectors Compression Fuel injector Power transistor Spark plug Ignition coil	G
INT V/T ASSIGN ANGLE	Engine: Return to the original non-standard condition Change intake valve timing using CONSULT-III.	If malfunctioning symptom disappears, see CHECK ITEM.	Harness and connectors Intake valve timing control solenoid valve	H
IGNITION TIM- ING	Engine: Return to the original non-standard condition Timing light: Set Retard the ignition timing using CONSULT-III.	If malfunctioning symptom disappears, see CHECK ITEM.	Perform Idle Air Volume Learning.	J

^{*:} Leaving cooling fan OFF with CONSULT-III while engine is running may cause the engine to overheat.

WORK SUPPORT MODE

Work Item

WORK ITEM	CONDITION	USAGE	
IDLE AIR VOL LEARN	The idle air volume that keeps the engine speed within the specified range is memorized in ECM.	When learning the idle air volume	M
EVAP SYSTEM CLOSE	Close the EVAP canister vent control valve in order to make EVAP system close under the following conditions. Ignition switch ON Engine not running Ambient air temperature is above 0°C (32°F). No vacuum and no high pressure in EVAP system Fuel tank temperature is more than 0°C (32°F). Within 10 minutes after starting "EVAP SYSTEM CLOSE" When trying to execute "EVAP SYSTEM CLOSE" under the condition except above, CONSULT-III will discontinue it and display appropriate instruction. NOTE: When starting engine, CONSULT-III may display "Battery voltage is low. Charge battery", even when using a charged battery.	When detecting EVAP vapor leak in the EVAP system	N O P
FUEL PRESSURE RELEASE	Fuel pump will stop by touching "START" during idling. Crank a few times after engine stalls.	When releasing fuel pressure from fuel line	

< SYSTEM DESCRIPTION >

[VK50VE]

WORK ITEM	CONDITION	USAGE
SELF-LEARNING CONT	The coefficient of self-learning control mixture ratio returns to the original coefficient.	When clearing mixture ratio self- learning value
EXH V/T CONTROL LEARN	In this mode, operation to learn exhaust valve timing control solenoid valve characteristic.	When learning the exhaust valve timing control
VIN REGISTRATION	VIN can be registered in ECM.	When registering VIN in ECM
VVEL POS SEN ADJ PREP	 Use this item only when replacing VVEL actuator sub assembly. Ignition switch ON and engine stopped 	When adjusting VVEL control shaft position sensor
TARGET IDLE RPM ADJ*	Idle condition	When setting target idle speed
TARGET IGN TIM ADJ*	Idle condition	When adjusting target ignition timing

^{*:} This function is not necessary in the usual service procedure.

DTC & SRT CONFIRMATION MODE

SRT STATUS Mode

For details, refer to EC-706, "Diagnosis Description".

SRT WORK SUPPORT Mode

This mode enables a technician to drive a vehicle to set the SRT while monitoring the SRT status.

DTC WORK SUPPORT Mode

Test mode	Test item	Corresponding DTC No.	Reference page
	HO2S2 (B1) P1146	P0138	EC-820
	HO2S2 (B1) P1147	P0137	EC-814
HO2S2	HO2S2 (B1) P0139	P0139	EC-828
HU252	HO2S2 (B2) P1166	P0158	EC-820
	HO2S2 (B2) P1167	P0157	EC-814
	HO2S2 (B2) P0159	P0159	EC-828
A/F SEN1	A/F SEN1 (B1) P1278/P1279	P0133	EC-809
	A/F SEN1 (B1) P1276	P0130	EC-799
	A/F SEN1 (B2) P1288/P1289	P0153	EC-809
	A/F SEN1 (B2) P1286	P0150	EC-799
	EVP SML LEAK P0442/P1442*	P0442	EC-887
EVAPORATIVE SYSTEM	EVP SIVIL LEAK P0442/P1442	P0455	EC-923
	EVP V/S LEAK P0456/P1456*	P0456	EC-929
	PURG VOL CN/V P1444	P0443	EC-893
	PURG FLOW P0441	P0441	EC-882

^{*:} DTC P1442 and P1456 does not apply to S51 models but appears in DTC Work Support Mode screens.

Diagnosis Tool Function

INFOID:0000000003958673

DESCRIPTION

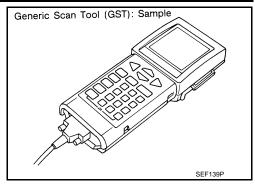
< SYSTEM DESCRIPTION >

[VK50VE]

Generic Scan Tool (OBD II scan tool) complying with SAE J1978 has 8 different functions explained below.

ISO 9141 is used as the protocol.

The name "GST" or "Generic Scan Tool" is used in this service manual.

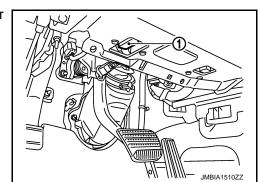


FUNCTION

Di	agnostic Service	Function
Service \$01	READINESS TESTS	This diagnostic service gains access to current emission-related data values, including analog inputs and outputs, digital inputs and outputs, and system status information.
Service \$02	(FREEZE DATA)	This diagnostic service gains access to emission-related data value that were stored by ECM during the freeze frame. For details, refer to EC-706 , "Diagnosis Description".
Service \$03	DTCs	This diagnostic service gains access to emission-related power train trouble codes which were stored by ECM.
Service \$04	CLEAR DIAG INFO	This diagnostic service can clear all emission-related diagnostic information. This includes: Clear number of diagnostic trouble codes (Service \$01) Clear diagnostic trouble codes (Service \$03) Clear trouble code for freeze frame data (Service \$01) Clear freeze frame data (Service \$02) Reset status of system monitoring test (Service \$01) Clear on board monitoring test results (Service \$06 and \$07)
Service \$06	(ON BOARD TESTS)	This diagnostic service accesses the results of on board diagnostic monitoring tests of specific components/systems that are not continuously monitored.
Service \$07	(ON BOARD TESTS)	This diagnostic service enables the off board test drive to obtain test results for emission-related powertrain components/systems that are continuously monitored during normal driving conditions.
Service \$08	_	This diagnostic service can close EVAP system in ignition switch ON position (Engine stopped). When this diagnostic service is performed, EVAP canister vent control valve can be closed. In the following conditions, this diagnostic service cannot function. Low ambient temperature Low battery voltage Engine running Ignition switch OFF Low fuel temperature Too much pressure is applied to EVAP system
Service \$09	(CALIBRATION ID)	This diagnostic service enables the off-board test device to request specific vehicle information such as Vehicle Identification Number (VIN) and Calibration IDs.

INSPECTION PROCEDURE

- 1. Turn ignition switch OFF.
- 2. Connect "GST" to data link connector (1), which is located under LH dash panel near the hood opener handle.
- 3. Turn ignition switch ON.



Revision: 2009 March EC-729 2009 FX35/FX50

EC

Α

C

D

Е

F

G

Н

J

K

L

M

N

0

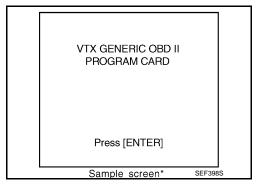
F

< SYSTEM DESCRIPTION >

[VK50VE]

1. Enter the program according to instruction on the screen or in the operation manual.

(*: Regarding GST screens in this section, sample screens are shown.)



Perform each diagnostic mode according to each service procedure.

For further information, see the GST Operation Manual of the tool maker.

OBD II FUNCTIONS

F0: DATA LIST

F1: FREEZE DATA

F2: DTCs

F3: SNAPSHOT

F4: CLEAR DIAG INFO

F5: O2 TEST RESULTS

F6: READINESS TESTS

F7: ON BOARD TESTS

F8: EXPAND DIAG PROT

F9: UNIT CONVERSION

Sample screen* SEF416S

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

DTC/CIRCUIT DIAGNOSIS

TROUBLE DIAGNOSIS - SPECIFICATION VALUE

Description INFOID:0000000003958674

The specification (SP) value indicates the tolerance of the value that is displayed in "SPEC" in "DATA MONI-TOR" mode of CONSULT-III during normal operation of the Engine Control System. When the value in "SPEC" in "DATA MONITOR" mode is within the SP value, the Engine Control System is confirmed OK. When the value in "SPEC" in "DATA MONITOR" mode is NOT within the SP value, the Engine Control System may have one or more malfunctions.

The SP value is used to detect malfunctions that may affect the Engine Control System, but will not illuminate the MIL.

The SP value will be displayed for the following three items:

- B/FUEL SCHDL (The fuel injection pulse width programmed into ECM prior to any learned on board correc-
- A/F ALPHA-B1/B2 (The mean value of air-fuel ratio feedback correction factor per cycle)
- MAS A/F SE-B1/B2 (The signal voltage of the mass air flow sensor)

Component Function Check

1.PRECONDITIONING

Check that all of the following conditions are satisfied.

TESTING CONDITION

- Vehicle driven distance: More than 5,000 km (3,107 miles)
- Barometric pressure: 98.3 104.3 kPa (1.003 1.064 kg/cm², 14.25 15.12 psi)
- Atmospheric temperature: 20 30°C (68 86°F)
- Engine coolant temperature: 75 95°C (167 203°F)
- Transmission: Warmed-up
- After the engine is warmed up to normal operating temperature, drive vehicle until "ATF TEMP 2" (A/T fluid temperature sensor signal) indicates more than 60°C (140°F).
- Electrical load: Not applied
- Rear window defogger switch, air conditioner switch and lighting switch are OFF. Steering wheel is straight ahead.
- · Engine speed: Idle

>> GO TO 2.

2.PERFORM SPEC IN DATA MONITOR MODE

With CONSULT-III

NOTE:

Perform "SPEC" in "DATA MONITOR" mode in maximum scale display.

- 1. Perform EC-577, "BASIC INSPECTION: Special Repair Requirement".
- Select "B/FUEL SCHDL", "A/F ALPHA-B1", "A/F ALPHA-B2", "MAS A/F SE-B1" and "MAS A/F SE-B2" in "SPEC" of "DATA MONITOR" mode with CONSULT-III.
- Check that monitor items are within the SP value.

Is the measurement value within the SP value?

YES >> INSPECTION END

NO >> Go to EC-732, "Diagnosis Procedure".

EC-731 Revision: 2009 March 2009 FX35/FX50

EC

Α

 \Box

Е

INFOID:0000000003958675

Н

K

M

N

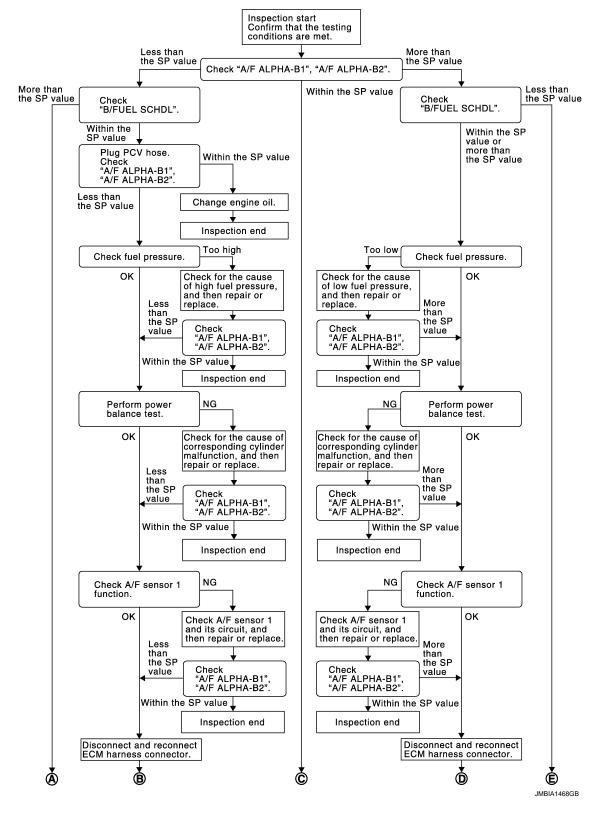
Р

[VK50VE]

Diagnosis Procedure

INFOID:0000000003958676

OVERALL SEQUENCE



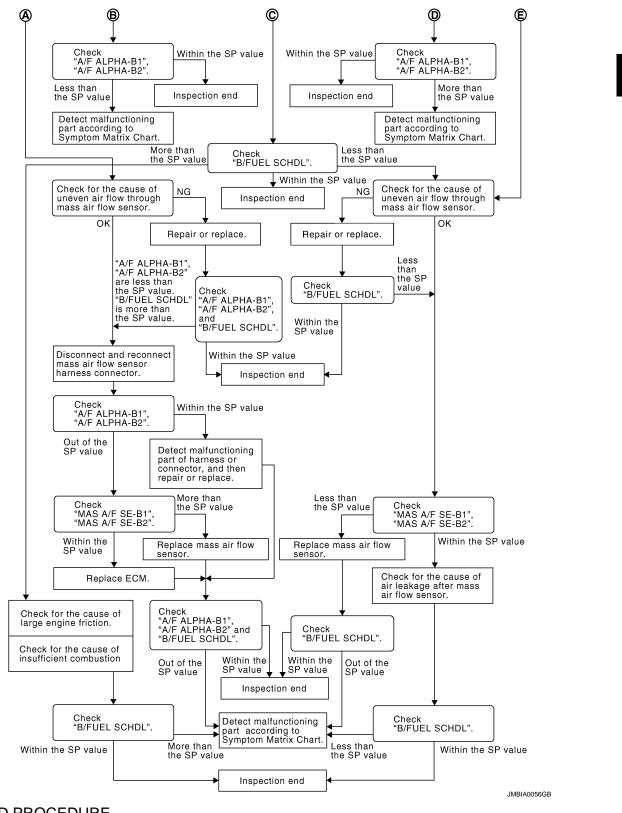
[VK50VE]

Α

EC

D

Р



DETAILED PROCEDURE

1.CHECK "A/F ALPHA-B1" AND "A/F ALPHA-B2"

(II) With CONSULT-III

- Start engine.
- Confirm that the testing conditions are met. Refer to <u>EC-731, "Component Function Check"</u>.
- 3. Select "A/F ALPHA-B1" and "A/F ALPHA-B2" in "SPEC" of "DATA MONITOR" mode, and check that each indication is within the SP value.

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

NOTE:

Check "A/F ALPHA-B1" and "A/F ALPHA-B2" for approximately 1 minute because they may fluctuate. It is NG if the indication is out of the SP value even a little.

Is the measurement value within the SP value?

YES >> GO TO 17.

NO-1 >> Less than the SP value: GO TO 2.

NO-2 >> More than the SP value: GO TO 3.

2.CHECK "B/FUEL SCHDL"

Select "B/FUEL SCHDL" in "SPEC" of "DATA MONITOR" mode, and check that the indication is within the SP value.

Is the measurement value within the SP value?

YES >> GO TO 4.

NO >> More than the SP value: GO TO 19.

${f 3.}$ CHECK "B/FUEL SCHDL"

Select "B/FUEL SCHDL" in "SPEC" of "DATA MONITOR" mode, and check that the indication is within the SP value.

Is the measurement value within the SP value?

YES >> GO TO 6.

NO-1 >> More than the SP value: GO TO 6.

NO-2 >> Less than the SP value: GO TO 25.

f 4.CHECK "A/F ALPHA-B1", "A/F ALPHA-B2"

- 1. Stop the engine.
- 2. Disconnect PCV hose, and then plug it.
- 3. Start engine.
- Select "A/F ALPHA-B1" and "A/F ALPHA-B2" in "SPEC" of "DATA MONITOR" mode, and check that each indication is within the SP value.

Is the measurement value within the SP value?

YES >> GO TO 5.

NO >> GO TO 6.

5. CHANGE ENGINE OIL

- 1. Stop the engine.
- Change engine oil.

NOTE:

This symptom may occur when a large amount of gasoline is mixed with engine oil because of driving conditions (such as when engine oil temperature does not rise enough since a journey distance is too short during winter). The symptom will not be detected after changing engine oil or changing driving conditions.

>> INSPECTION END

6. CHECK FUEL PRESSURE

Check fuel pressure. (Refer to EC-1228, "Inspection".)

Is the inspection result normal?

YES >> GO TO 9.

NO-1 >> Fuel pressure is too high: Replace "fuel filter and fuel pump assembly" and then GO TO 8.

NO-2 >> Fuel pressure is too low: GO TO 7.

7.DETECT MALFUNCTIONING PART

Check fuel hoses and fuel tubes for clogging.

Is the inspection result normal?

YES >> Replace "fuel filter and fuel pump assembly" and then GO TO 8.

NO >> Repair or replace and then GO TO 8.

$oldsymbol{8}.$ CHECK "A/F ALPHA-B1" AND "A/F ALPHA-B2"

< DTC/CIRCUIT DIAGNOSIS > [VK50V	<u>'E]</u>
 Start engine. Select "A/F ALPHA-B1" and "A/F ALPHA-B2" in "SPEC" of "DATA MONITOR" mode, and check that earlindication is within the SP value. 	ach A
Is the measurement value within the SP value?	
YES >> INSPECTION END NO >> GO TO 9.	EC
9. PERFORM POWER BALANCE TEST	
 Perform "POWER BALANCE" in "ACTIVE TEST" mode. Check that each cylinder produces a momentary engine speed drop. 	C
Is the inspection result normal?	D
YES >> GO TO 12. NO >> GO TO 10.	D
10. DETECT MALFUNCTIONING PART	Е
Check the following below. • Ignition coil and its circuit (Refer to <u>EC-1107</u> , "Component Function Check".) • Fuel injector and its circuit (Refer to <u>EC-1096</u> , "Component Function Check".) • Intake air leakage • Low compression pressure (Refer to <u>EM-173</u> , "Inspection".)	F
Is the inspection result normal?	
YES >> Replace fuel injector and then GO TO 11.	G
NO >> Repair or replace malfunctioning part and then GO TO 11.	
11.CHECK "A/F ALPHA-B1" AND "A/F ALPHA-B2"	H
 Start engine. Select "A/F ALPHA-B1" and "A/F ALPHA-B2" in "SPEC" of "DATA MONITOR" mode, and check that earlindication is within the SP value. 	ach
Is the measurement value within the SP value?	
YES >> INSPECTION END NO >> GO TO 12.	
12. CHECK A/F SENSOR 1 FUNCTION	J
Perform all DTC CONFIRMATION PROCEDURE related with A/F sensor 1. • For DTC P0130, P0150, refer to EC-799, "DTC Logic". • For DTC P0131, P0151, refer to EC-803, "DTC Logic". • For DTC P0132, P0152, refer to EC-806, "DTC Logic". • For DTC P0133, P0153, refer to EC-809, "DTC Logic". • For DTC P2A00, P2A03, refer to EC-1081, "DTC Logic".	 К L
Are any DTCs detected?	
YES >> GO TO 13. NO >> GO TO 15.	M
13. CHECK A/F SENSOR 1 CIRCUIT	
Perform Diagnosis Procedure according to corresponding DTC.	<u> </u>
00.70.44	
>> GO TO 14.	0
14. CHECK "A/F ALPHA-B1" AND "A/F ALPHA-B2"	
 Start engine. Select "A/F ALPHA-B1" and "A/F ALPHA-B2" in "SPEC" of "DATA MONITOR" mode, and check that earlindication is within the SP value. 	ach P
Is the measurement value within the SP value?	
YES >> INSPECTION END NO >> GO TO 15.	

Revision: 2009 March **EC-735** 2009 FX35/FX50

15. DISCONNECT AND RECONNECT ECM HARNESS CONNECTOR

1. Stop the engine.

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Disconnect ECM harness connector. Check pin terminal and connector for damage, and then reconnect it.

>> GO TO 16.

16.CHECK "A/F ALPHA-B1" AND "A/F ALPHA-B2"

- Start engine.
- Select "A/F ALPHA-B1" and "A/F ALPHA-B2" in "SPEC" of "DATA MONITOR" mode, and check that each indication is within the SP value.

Is the measurement value within the SP value?

YES >> INSPECTION END

NO >> Detect malfunctioning part according to EC-1215, "Symptom Table".

17. CHECK "B/FUEL SCHDL"

Select "B/FUEL SCHDL" in "SPEC" of "DATA MONITOR" mode, and check that the indication is within the SP value.

Is the measurement value within the SP value?

YES >> INSPECTION END

NO-1 >> More than the SP value: GO TO 18.

NO-2 >> Less than the SP value: GO TO 25.

18. DETECT MALFUNCTIONING PART

- Check for the cause of large engine friction. Refer to the following.
- Engine oil level is too high
- Engine oil viscosity
- Belt tension of power steering, alternator, A/C compressor, etc. is excessive
- Noise from engine
- Noise from transmission, etc.
- Check for the cause of insufficient combustion. Refer to the following.
- Valve clearance malfunction
- Intake valve timing control function malfunction
- Camshaft sprocket installation malfunction, etc.

>> Repair or replace malfunctioning part, and then GO TO 30.

19. CHECK INTAKE SYSTEM

Check for the cause of uneven air flow through mass air flow sensor. Refer to the following.

- Crushed air ducts
- · Malfunctioning seal of air cleaner element
- Uneven dirt of air cleaner element
- Improper specification of intake air system

Is the inspection result normal?

YES >> GO TO 21.

NO >> Repair or replace malfunctioning part, and then GO TO 20.

20.CHECK "A/F ALPHA-B1", "A/F ALPHA-B2" AND "B/FUEL SCHDL"

Select "A/F ALPHA-B1", "A/F ALPHA-B2" and "B/FUEL SCHDL" in "SPEC" of "DATA MONITOR" mode, and check that each indication is within the SP value.

Is the measurement value within the SP value?

YES >> INSPECTION END

NO >> "B/FUEL SCHDL" is more, "A/F ALPHA-B1" and "A/F ALPHA-B2" are less than the SP value: GO TO 21.

21. DISCONNECT AND RECONNECT MASS AIR FLOW SENSOR HARNESS CONNECTOR

- Stop the engine.
- 2. Disconnect mass air flow sensor harness connector. Check pin terminal and connector for damage and then reconnect it again.

>> GO TO 22.

< DTC/CIRCUIT DIAGNOSIS >

22.CHECK "A/F ALPHA-B1" AND "A/F ALPHA-B2"

Start engine.

Select "A/F ALPHA-B1" and "A/F ALPHA-B2" in "SPEC" of "DATA MONITOR" mode, and check that each indication is within the SP value.

Is the measurement value within the SP value?

>> Detect malfunctioning part of mass air flow sensor circuit and repair it. Refer to EC-776, "Diagnosis Procedure". Then GO TO 29.

NO >> GO TO 23.

23.CHECK "MAS A/F SE-B1" AND "MAS A/F SE-B2"

Select "MAS A/F SE-B1" and "MAS A/F SE-B2" in "SPEC" of "DATA MONITOR" mode, and check that the indication is within the SP value.

Is the measurement value within the SP value?

YES >> GO TO 24.

NO >> More than the SP value: Replace malfunctioning mass air flow sensor, and then GO TO 29.

24.REPLACE ECM

Replace ECM.

Perform EC-580, "ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT (ECM): Special Repair Requirement".

>> GO TO 29.

25. CHECK INTAKE SYSTEM

Check for the cause of uneven air flow through mass air flow sensor. Refer to the following.

Crushed air ducts

- Malfunctioning seal in air cleaner element
- Uneven dirt in air cleaner element
- · Improper specification in intake air system

Is the inspection result normal?

YES >> GO TO 27.

NO >> Repair or replace malfunctioning part, and then GO TO 26.

26.CHECK "B/FUEL SCHDL"

Select "B/FUEL SCHDL" in "SPEC" of "DATA MONITOR" mode, and check that the indication is within the SP value.

Is the measurement value within the SP value?

YES >> INSPECTION END

NO >> Less than the SP value: GO TO 27.

27.CHECK "MAS A/F SE-B1" AND "MAS A/F SE-B2"

Select "MAS A/F SE-B1" and "MAS A/F SE-B2" in "SPEC" of "DATA MONITOR" mode, and check that the indication is within the SP value.

Is the measurement value within the SP value?

YES >> GO TO 28.

NO >> Less than the SP value: Replace malfunctioning mass air flow sensor, and then GO TO 30.

28. CHECK INTAKE SYSTEM

Check for the cause of air leakage after the mass air flow sensor. Refer to the following.

- Disconnection, looseness, and cracks in air duct
- · Looseness of oil filler cap

Revision: 2009 March

- · Disconnection of oil level gauge
- Open stuck, breakage, hose disconnection, or cracks in PCV valve
- Disconnection or cracks in EVAP purge hose, stuck open EVAP canister purge volume control solenoid
- Malfunctioning seal in rocker cover gasket
- Disconnection, looseness, or cracks in hoses, such as a vacuum hose, connecting to intake air system parts

EC

[VK50VE]

M

N

Р

EC-737

2009 FX35/FX50

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

• Malfunctioning seal in intake air system, etc.

>> GO TO 30.

 $29.\mathsf{CHECK}$ "A/F ALPHA-B1", "A/F ALPHA-B2" AND "B/FUEL SCHDL"

Select "A/F ALPHA-B1", "A/F ALPHA-B2" and "B/FUEL SCHDL" in "SPEC" of "DATA MONITOR" mode, and check that each indication is within the SP value.

Is the measurement value within the SP value?

YES >> INSPECTION END

NO >> Detect malfunctioning part according to EC-1215, "Symptom Table".

30.check "B/FUEL SCHDL"

Select "B/FUEL SCHDL" in "SPEC" of "DATA MONITOR" mode, and then check that the indication is within the SP value.

Is the measurement value within the SP value?

YES >> INSPECTION END

NO >> Detect malfunctioning part according to EC-1215. "Symptom Table".

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

INFOID:0000000003958677

1. CHECK GROUND CONNECTION

Α

EC

D

Е

F

N

- 1. Turn ignition switch OFF.
- 2. Check ground connection M95. Refer to "Ground Inspection" in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK ECM GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Disconnect ECM harness connector.
- 2. Check the continuity between ECM harness connector and ground.

E	СМ	Ground	Continuity	
Connector Terminal		Giodila	Continuity	
F110	6			
F111	54	Ground	Existed	
M160	123	Glound	LAISIEU	
WITOU	128			

3. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F103, M116
- Harness for open or short between ECM and ground

>> Repair open circuit or short to power in harness or connectors.

4. CHECK ECM POWER SUPPLY CIRCUIT-I

- 1. Reconnect ECM harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between ECM harness connector terminals.

	+ -			Voltage
Connector	Terminal	Connector Terminal		
M160	106	M160	128	Battery voltage

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E10, F10
- Harness connectors F103, M116
- IPDM E/R harness connector E7
- 10 A fuse (No. 44)
- Harness for open or short between ECM and fuse

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

>> Repair open circuit, short to ground or short to power in harness or connectors.

6. CHECK ECM POWER SUPPLY CIRCUIT-II

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Check the voltage between ECM harness connector terminals as per the following.

ECM			
Connector	+	_	Voltage
Connector	Terminal	Terminal	
M160	121	128	After turning ignition switch OFF, battery voltage will exist for a few seconds, then drop to approximately 0 V.

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 9.

7.CHECK ECM POWER SUPPLY CIRCUIT-III

- 1. Turn ignition switch ON.
- 2. Check the voltage between IPDM E/R harness connector and ground.

IPDN	I E/R	Ground	Voltage
Connector	Connector Terminal		voltage
E7	49	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 8.

NO >> Replace IPDM E/R.

8. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

9. CHECK ECM POWER SUPPLY CIRCUIT-IV

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Check the voltage between ECM harness connector terminals as per the following.

+		-	_	Voltage
Connector	Terminal	Connector Terminal		
F110	15	M160	128	Battery voltage

Is the inspection result normal?

YES >> GO TO 13.

NO >> GO TO 10.

10. CHECK ECM POWER SUPPLY CIRCUIT-V

- Disconnect ECM harness connector.
- Disconnect IPDM E/R harness connector.
- 3. Check the continuity between ECM harness connector and IPDM E/R harness connector.

ECM		IPDM E/R		Continuity
Connector	Terminal	Connector Terminal		Continuity
F110	15	E7	69	Existed

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCU			UPPLI AN	ID GROU	ND CIRCUIT	[VK50VE]
Is the inspection						
	O TO 12.					А
	O TO 11.					
11.DETECT	MALFUNCT	IONING PAR	Γ			EC
Check the follo		40 540				
Harness or oHarness for o			M and IPDM	E/R		
				_,		C
>> Re	epair open ci	rcuit, short to	ground or sho	ort to power i	in harness or connectors.	
12. CHECK 1	5 A FUSE					D
1. Disconnec	t 15 A fuse ((No. 50) from	IPDM E/R.			
2. Check 15						_
Is the inspection		mal?				Е
	O TO 15. eplace 15 A f	fuse.				
13.CHECK E	•		RCUIT-VI			F
		ess connector				
		harness conn				
Check the	continuity be	etween ECM	harness conn	ector and IP	DM E/R harness connector.	G
		IDDA	4 E /D		_	
Connector			/I E/R	Continuity		H
Connector M160	Terminal 121	Connector E5	Terminal 10	Existed	_	
4. Also check					_	I
Is the inspection		_	nu anu snort	to power.		
•	O TO 15.	III III II				
	O TO 14.					J
14.DETECT	MALFUNCT	TONING PAR	Т			
Check the follo						K
Harness or cHarness for c			M and IPDM	F/R		
· Hamess for t	spen or snor	t between LO	IVI AIIG II DIVI	L/1X		
>> Re	epair open ci	rcuit, short to	ground or sho	ort to power i	in harness or connectors.	L
15. CHECK I				·		
Refer to GI-35	 . "Intermitten	nt Incident".				
Is the inspection						
YES >> Re	eplace IPDM	E/R.				Α.
NO >> Re	epair open ci	rcuit, short to	ground or sho	ort to power i	in harness or connectors.	N
						C
						P
						F

Revision: 2009 March **EC-741** 2009 FX35/FX50

[VK50VE]

U0101 CAN COMM CIRCUIT

Description INFOID:000000004025636

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
U0101	Lost communication with TCM	When ECM is not transmitting or receiving CAN communication signal of OBD (emission related diagnosis) with TCM for 2 seconds or more.	CAN communication line betrween TCM and ECM (CAN communication line is open or shorted)

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Turn ignition switch ON and wait at least 3 seconds.
- Check DTC.

Is DTC detected?

YES >> EC-742, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

Go to LAN-22, "Trouble Diagnosis Flow Chart".

INFOID:0000000004025638

U0113, U1003 CAN COMM CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

U0113, U1003 CAN COMM CIRCUIT

Description INFOID:0000000003959754

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. ECM and VVEL control module are connected with two communication lines (CAN H line and CAN L line) and transmit/ receive data. ECM shares information and links with the VVEL control module during operation.

DTC Logic INFOID:0000000003959755

DTC DETECTION LOGIC

NOTE:

If DTC U0113 or U1003 is displayed with DTC P0607, first perform the trouble diagnosis for DTC P0607. Refer to EC-958, "DTC Logic".

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	
U0113	Lost communication with VVEL	When ECM is not transmitting or receiving CAN communication signal of OBD (emission related diagnosis) with VVEL control module for 2 seconds or more.		Harness or connectors (VVEL CAN communication line is open or shorted)
U1003	control module	When ECM is not transmitting or receiving CAN communication signal other than OBD (emission related diagnosis) with VVEL control module for 2 seconds or more.	ECM VVEL control module	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10 V at idle.

>> GO TO 2.

2 .PERFORM DTC CONFIRMATION PROCEDURE

- Turn ignition switch ON and wait at least 3 seconds.
- Check DTC.

Is DTC detected?

>> Go to EC-743, "Diagnosis Procedure". YES

NO >> INSPECTION END

Diagnosis Procedure

1. CHECK VVEL CAN COMMUNICATION CIRCUIT

- Turn ignition switch OFF.
- Disconnect ECM harness connector. 2.
- Disconnect VVEL control module harness connector.
- Check the continuity between ECM harness connector and VVEL control module harness connector.

ECM		VVEL control module		Continuity
Connector	Terminal	Connector	Terminal	Continuity
F111	89	E16	24	Existed
M160	93	LIO	11	LXISIEU

5. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 3. NO >> GO TO 2.

EC-743 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

INFOID:0000000003959756

N

Р

U0113, U1003 CAN COMM CIRCUIT

[VK50VE]

< DTC/CIRCUIT DIAGNOSIS >

2.DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E10, F10
- Harness for open or short between ECM and VVEL control module
 - >> Repair open circuit, short to ground or short to power in harness or connectors.

3.CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace.

4. REPLACE VVEL CONTROL MODULE

- 1. Replace VVEL control module.
- Perform <u>EC-580</u>, "ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT (VVEL CONTROL MODULE): Special Repair Requirement".

>> GO TO 5.

5. PERFORM DTC CONFIRMATION PROCEDURE

- (P) With CONSULT-III
- 1. Reconnect all harness connectors disconnected.
- 2. Turn ignition switch ON.
- 3. Select "SELF DIAGNOSTIC RESULT" mode with CONSULT-III.
- 4. Touch "ERASE".
- 5. Perform DTC Confirmation Procedure.

See EC-743, "DTC Logic".

- With GST
- 1. Reconnect all harness connectors disconnected.
- Turn ignition switch ON.
- 3. Select Service \$04 with GST.
- 4. Perform DTC Confirmation Procedure.

See EC-743, "DTC Logic".

Is the DTC U0113 or U1003 displayed again?

YES >> GO TO 6.

NO >> INSPECTION END

6.REPLACE ECM

- Replace ECM.
- 2. Perform <u>EC-580</u>, "ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT (ECM) : Special Repair Requirement".

>> INSPECTION END

U1001 CAN COMM CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

U1001 CAN COMM CIRCUIT

Description INFOID:0000000003958678

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

DTC Logic INFOID:0000000003958679

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
U1001	CAN communication line	When ECM is not transmitting or receiving CAN communication signal other than OBD (emission related diagnosis) for 2 seconds or more.	Harness or connectors (CAN communication line is open or shorted)

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

- Turn ignition switch ON and wait at least 3 seconds.
- Check 1st trip DTC. 2.

Is 1st trip DTC detected?

YES >> EC-745, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

Go to LAN-22, "Trouble Diagnosis Flow Chart".

INFOID:0000000003958680

EC-745 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

F

Н

K

Ν

[VK50VE]

U1024 CAN COMM CIRCUIT

Description

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. ECM and VVEL control module are connected with two communication lines (CAN H line and CAN L line) and transmit/receive data. ECM shares information and links with the VVEL control module during operation.

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC U1024 is displayed with DTC P0607, first perform the trouble diagnosis for DTC P0607. Refer to EC-958, "DTC Logic".

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
U1024	VVEL CAN communication	 When VVEL control module cannot transmitting or receiving CAN communication signal with ECM for 2 seconds or more. When detecting error during the initial diagnosis of CAN controller of VVEL control module. 	Harness or connectors (CAN communication line is open or shorted) ECM VVEL control module

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10 V at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Turn ignition switch ON and wait at least 3 seconds.
- 2. Check DTC.

Is DTC detected?

YES >> Go to EC-746, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003959759

1. CHECK VVEL CAN COMMUNICATION CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Disconnect VVEL control module harness connector.
- Check the continuity between ECM harness connector and VVEL control module harness connector.

ECM		VVEL control module		Continuity
Connector	Terminal	Connector	Terminal	Continuity
F111	89	E16	24	Existed
M160	93	LIU	11	LXISIEU

5. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 3. NO >> GO TO 2.

2.DETECT MALFUNCTIONING PART

Check the following.

U1024 CAN COMM CIRCUIT

[VK50VE] < DTC/CIRCUIT DIAGNOSIS > • Harness connectors E10, F10 Harness for open or short between ECM and VVEL control module Α >> Repair open circuit, short to ground or short to power in harness or connectors. EC 3.CHECK INTERMITTENT INCIDENT Refer to GI-35, "Intermittent Incident". Is the inspection result normal? YES >> GO TO 4. NO >> Repair or replace. 4. REPLACE VVEL CONTROL MODULE D Replace VVEL control module. 2. Perform EC-580, "ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT (VVEL CONTROL Е MODULE): Special Repair Requirement". >> GO TO 5. F 5. PERFORM DTC CONFIRMATION PROCEDURE (P) With CONSULT-III 1. Reconnect all harness connectors disconnected. Turn ignition switch ON. Select "SELF DIAGNOSTIC RESULT" mode with CONSULT-III. Touch "ERASE". Н 5. Perform DTC Confirmation Procedure. See EC-746, "DTC Logic". With GST 1. Reconnect all harness connectors disconnected. 2. Turn ignition switch ON. Select Service \$04 with GST. Perform DTC Confirmation Procedure. See EC-746, "DTC Logic". Is the DTC U1024 displayed again? YES >> GO TO 6. NO >> INSPECTION END 6.REPLACE ECM Replace ECM. 2. Go to EC-580, "ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT (ECM): Special Repair Requirement". M >> INSPECTION END Ν Р

Revision: 2009 March EC-747 2009 FX35/FX50

P0011, P0021 IVT CONTROL

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P0011 or P0021 is displayed with DTC P0075 or P0081, first perform the trouble diagnosis for DTC P0075, P0081. Refer to EC-762, "DTC Logic".

DTC No.	Trouble diagnosis name	Detecting condition	Possible cause
P0011	Intake valve timing control performance (bank 1)		Crankshaft position sensor Camshaft position sensor
P0021	Intake valve timing control performance (bank 2)	There is a gap between angle of target and phase-control angle degree.	 Intake valve timing control solenoid valve Accumulation of debris to the signal pick-up portion of the camshaft Timing chain installation Foreign matter caught in the oil groove for intake valve timing control

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 11 V at idle.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE-I

- (II) With CONSULT-III
- 1. Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-III.
- 2. Start engine and warm it up to the normal operating temperature.
- 3. Maintain the following conditions for at least 6 consecutive seconds. Hold the accelerator pedal as steady as possible.

ENG SPEED	Less than 2,000 rpm (A constant rotation is maintained.)
COOLAN TEMP/S	More than 70°C (158°F)
Selector lever	P or N position

- 4. Let engine idle for 25 seconds.
- 5. Check 1st trip DTC.
- With GST

Follow the procedure "With CONSULT-III" above.

Is 1st trip DTC detected?

YES >> Go to EC-749, "Diagnosis Procedure"

NO >> GO TO 3.

3.perform dtc confirmation procedure-ii

- (II) With CONSULT-III
- Select "DATA MONITOR" mode with CONSULT-III.
- Maintain the following conditions for at least 20 consecutive seconds.

ENG SPEED	1,500 - 3,175 rpm (A constant rotation is maintained.)
COOLAN TEMP/S	More than 70°C (158°F)

Revision: 2009 March EC-748 2009 FX35/FX50

P0011, P0021 IVT CONTROL

< DTC/CIRCUIT DIAGNOSIS >

[۷K	50	VE]

Selector lever	1st or 2nd position
Driving location uphill	Driving vehicle uphill (Increased engine load will help maintain the driving conditions required for this test.)

EC

D

Α

CAUTION:

Always drive at a safe speed.

- 3. Check 1st trip DTC.
- With GST

Follow the procedure "With CONSULT-III" above.

Is 1st trip DTC detected?

YES >> Go to EC-749, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003958682

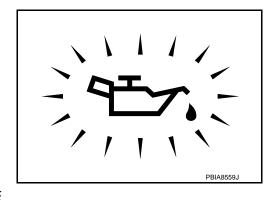
1. CHECK OIL PRESSURE WARNING LAMP

- Start engine.
- 2. Check that oil pressure warning lamp is not illuminated.

Is oil pressure warning lamp illuminated?

YES >> Go to <u>LU-25</u>, "Inspection".

NO >> GO TO 2.



2.CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE

Refer to EC-750, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace malfunctioning intake valve timing control solenoid valve.

3. CHECK CRANKSHAFT POSITION SENSOR

Refer to EC-870, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace crankshaft position sensor.

4. CHECK CAMSHAFT POSITION SENSOR

Refer to EC-875, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace malfunctioning camshaft position sensor.

5. CHECK CAMSHAFT (INTAKE)

Check the following.

ı

Revision: 2009 March EC-749 2009 FX35/FX50

K

L

M

Ν

0

Р

[VK50VE]

< DTC/CIRCUIT DIAGNOSIS >

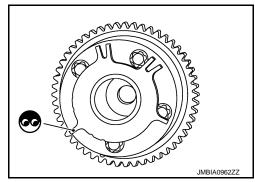
- · Accumulation of debris on the signal plate of camshaft front end
- · Chipping signal plate of camshaft front end

Is the inspection result normal?

YES >> GO TO 6.

NO

>> Remove debris and clean the signal plate of camshaft front end or replace camshaft.



6. CHECK TIMING CHAIN INSTALLATION

Check service records for any recent repairs that may cause timing chain misalignment.

Are there any service records that may cause timing chain misalignment?

YES >> Check timing chain installation. Refer to EM-213, "Disassembly and Assembly".

NO >> GO TO 7.

7.CHECK LUBRICATION CIRCUIT

Perform "Inspection of Camshaft Sprocket (INT) Oil Groove". Refer to EM-236, "Inspection".

Is the inspection result normal?

YES >> GO TO 8.

NO >> Clean lubrication line.

8. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000003958683

1. CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE-I

- 1. Turn ignition switch OFF.
- 2. Disconnect intake valve timing control solenoid valve harness connector.
- 3. Check resistance between intake valve timing control solenoid valve terminals as per the following.

Terminals	Resistance
1 and 2	7.0 - 7.7 Ω [at 20°C (68°F)]
1 or 2 and ground	$\stackrel{\scriptstyle \infty}{} \Omega$ (Continuity should not exist)

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace malfunctioning intake valve timing control solenoid valve.

2.CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE-II

- 1. Remove intake valve timing control solenoid valve.
- Provide 12 V DC between intake valve timing control solenoid valve terminals 1 and 2, and then interrupt it. Check that the plunger moves as shown in the figure.

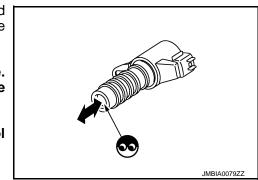
CAUTION:

Never apply 12 V DC continuously for 5 seconds or more. Doing so may result in damage to the coil in intake valve timing control solenoid valve.

NOTE:

Always replace O-ring when intake valve timing control solenoid valve is removed.

Is the inspection result normal?



P0011, P0021 IVT CONTROL

[VK50VE] < DTC/CIRCUIT DIAGNOSIS >

YES >> INSPECTION END

>> Replace malfunctioning intake valve timing control solenoid valve. NO

EC

Α

С

D

Е

F

G

Н

J

Κ

L

M

Ν

0

Ρ

[VK50VE]

P0014, P0024 EVT CONTROL

DTC Logic

DTC DETECTION LOGIC

NOTE:

- If DTC P0014 or P0024 is displayed with DTC P0078, P0084 first perform trouble diagnosis for DTC P0078, P0084. Refer to <u>EC-765</u>, "<u>DTC Logic"</u>.
- If DTC P0014 or P0024 is displayed with DTC P1078, P1084 first perform trouble diagnosis for DTC P1078, P1084. Refer to <u>EC-969</u>, "<u>DTC Logic</u>".

DTC No.	Trouble diagnosis name	Detecting condition	Possible cause
P0014	Exhaust valve timing control performance (bank 1)		Crankshaft position sensor Camshaft position sensor
P0024	Exhaust valve timing control performance (bank 2)	There is a gap between angle of target and phase-control angle degree.	 Exhaust valve timing control position sensor Exhaust valve timing control solenoid valve Accumulation of debris to the signal pick-up portion of the camshaft Timing chain installation Foreign matter caught in the oil groove for exhaust valve timing control

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 11 V at idle.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE-I

(P) With CONSULT-III

- Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-III.
- 2. Start engine and warm it up to the normal operating temperature.
- 3. Maintain the following conditions for at least 6 consecutive seconds. Hold the accelerator pedal as steady as possible.

ENG SPEED	Less than 2,000 rpm (A constant rotation is maintained.)
COOLAN TEMP/S	More than 70°C (158°F)
Selector lever	P or N position

- 4. Let engine idle for 10 seconds.
- Check 1st trip DTC.
- With GST

Follow the procedure "With CONSULT-III" above.

Is 1st trip DTC detected?

YES >> Go to EC-753, "Diagnosis Procedure"

NO >> GO TO 3.

3. PERFORM DTC CONFIRMATION PROCEDURE-II

(P) With CONSULT-III

- 1. Select "DATA MONITOR" mode with CONSULT-III.
- 2. Maintain the following conditions for at least 20 consecutive seconds.

P0014, P0024 EVT CONTROL

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

ENG SPEED	1,500 - 3,175 rpm (A constant rotation is maintained.)	
COOLAN TEMP/S	More than 70°C (158°F)	
Selector lever	1st or 2nd position	
Driving location uphill	Driving vehicle uphill (Increased engine load will help maintain the driving conditions required for this test.)	

EC

D

Е

Н

Ν

Α

CAUTION:

Always drive at a safe speed.

- 3. Check 1st trip DTC.
- With GST

Follow the procedure "With CONSULT-III" above.

Is 1st trip DTC detected?

YES >> Go to EC-753. "Diagnosis Procedure"

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003958685

= 10.g. 10010 1 1000 0.0.10

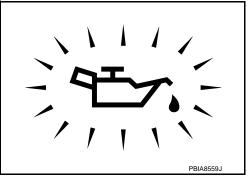
1. CHECK OIL PRESSURE WARNING LAMP

- Start engine.
- 2. Check that oil pressure warning lamp is not illuminated.

Is oil pressure warning lamp illuminated?

YES >> Go to <u>LU-25</u>, "Inspection".

NO >> GO TO 2.



2.CHECK EXHAUST VALVE TIMING CONTROL SOLENOID VALVE

Refer to EC-754, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace malfunctioning exhaust valve timing control solenoid valve.

3.check exhaust valve timing control position sensor

Refer to EC-972, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace malfunctioning exhaust valve timing control position sensor.

4. CHECK CRANKSHAFT POSITION SENSOR

Refer to EC-870, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace crankshaft position sensor.

5. CHECK CAMSHAFT POSITION SENSOR

Refer to EC-875, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace malfunctioning camshaft position sensor.

PBIARS59J

//E

enoid valve.
SOR

sition sensor.

< DTC/CIRCUIT DIAGNOSIS >

6. CHECK CAMSHAFT (EXH)

Check the following.

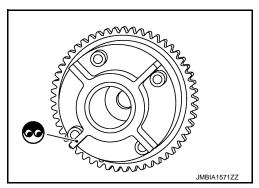
- · Accumulation of debris to the signal plate of camshaft front end
- · Chipping signal plate of camshaft front end

Is the inspection result normal?

YES >> GO TO 7.

NO

>> Remove debris and clean the signal plate of camshaft front end or replace camshaft.



7. CHECK TIMING CHAIN INSTALLATION

Check service records for any recent repairs that may cause timing chain misaligned.

Are there any service records that may cause timing chain misaligned?

YES >> Check timing chain installation. Refer to EM-213, "Disassembly and Assembly".

NO >> GO TO 8.

8. CHECK LUBRICATION CIRCUIT

Perform "Inspection of Camshaft Sprocket (EXT) Oil Groove". Refer to EM-236, "Inspection".

Is the inspection result normal?

YES >> GO TO 9.

NO >> Clean lubrication line.

9. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000003958686

1. CHECK EXHAUST VALVE TIMING CONTROL SOLENOID VALVE-I

- 1. Turn ignition switch OFF.
- 2. Disconnect exhaust valve timing control solenoid valve harness connector.
- 3. Check resistance between exhaust valve timing control solenoid valve terminals as per the following.

Terminals	Resistance	
1 and 2	7.0 - 7.7 Ω [at 20°C (68°F)]	
1 or 2 and ground	$\stackrel{\scriptstyle \infty}{} \Omega$ (Continuity should not exist)	

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace malfunctioning exhaust valve timing control solenoid valve.

2.CHECK EXHAUST VALVE TIMING CONTROL SOLENOID VALVE-II

1. Remove exhaust valve timing control solenoid valve.

P0014, P0024 EVT CONTROL

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Provide 12 V DC between exhaust valve timing control solenoid valve terminals 1 and 2, and then interrupt it. Check that the plunger moves as shown in the figure.

CAUTION:

Do not apply 12 V DC continuously for 5 seconds or more. Doing so may result in damage to the coil in exhaust valve timing control solenoid valve.

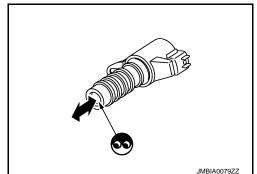
NOTE:

Always replace O-ring when exhaust valve timing control solenoid valve is removed.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace malfunctioning exhaust valve timing control solenoid valve.



EC

Α

С

D

Е

F

Н

K

L

Ν

0

Р

[VK50VE]

P0031, P0032, P0051, P0052 A/F SENSOR 1 HEATER

Description

SYSTEM DESCRIPTION

Sensor	Input signal to ECM	ECM function	Actuator
Camshaft position sensor Crankshaft position sensor	Engine speed	Air fuel ratio (A/F) sensor 1	Air fuel ratio (A/F) sensor 1 heater
Mass air flow sensor	Amount of intake air	TICALOT COTILION	

The ECM performs ON/OFF duty control of the A/F sensor 1 heater corresponding to the engine operating condition to keep the temperature of A/F sensor 1 element within the specified range.

DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0031	A/F sensor 1 heater (bank 1) control circuit low	The current amperage in the A/F sensor 1 heater circuit is out of the normal range. (An excessively low voltage signal is sent to ECM through the A/F sensor 1 heater.)	Harness or connectors (The A/F sensor 1 heater circuit is open or shorted.) A/F sensor 1 heater
P0032	A/F sensor 1 heater (bank 1) control circuit high	The current amperage in the A/F sensor 1 heater circuit is out of the normal range. (An excessively high voltage signal is sent to ECM through the A/F sensor 1 heater.)	 Harness or connectors (The A/F sensor 1 heater circuit is shorted.) A/F sensor 1 heater
P0051	A/F sensor 1 heater (bank 2) control circuit low	The current amperage in the A/F sensor 1 heater circuit is out of the normal range. (An excessively low voltage signal is sent to ECM through the A/F sensor 1 heater.)	Harness or connectors (The A/F sensor 1 heater circuit is open or shorted.) A/F sensor 1 heater
P0052	A/F sensor 1 heater (bank 2) control circuit high	The current amperage in the A/F sensor 1 heater circuit is out of the normal range. (An excessively high voltage signal is sent to ECM through the A/F sensor 1 heater.)	Harness or connectors (The A/F sensor 1 heater circuit is shorted.) A/F sensor 1 heater

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 11 V at idle.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- Start engine and let it idle for at least 10 seconds.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-756, "Diagnosis Procedure".

NG >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003958689

1. CHECK GROUND CONNECTION

Revision: 2009 March **EC-756** 2009 FX35/FX50

P0031, P0032, P0051, P0052 A/F SENSOR 1 HEATER

< DTC/CIRCUIT DIAGNOSIS >

Turn ignition switch OFF.

Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK AIR FUEL RATIO (A/F) SENSOR 1 POWER SUPPLY CIRCUIT

- 1. Disconnect air fuel ratio (A/F) sensor 1 harness connector.
- Turn ignition switch ON.
- Check the voltage between A/F sensor 1 harness connector and ground.

DTC		A/F sensor	1	Ground	Voltage
DIC	Bank	Connector	Terminal	Giodila	voltage
P0031, P0032	1	F67	4	Ground	Battery voltage
P0051, P0052	2	F68	4	Giodila	Ballery Vollage

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E10, F10
- IPDM E/R harness connector E7
- 15 A fuse (No. 46)
- Harness for open or short between A/F sensor 1 and fuse

>> Repair or replace harness or connectors.

f 4.CHECK A/F SENSOR 1 HEATER OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- Disconnect ECM harness connector.
- Check the continuity between A/F sensor 1 harness connector and ECM harness connector.

DTC	A/F sensor 1			E	Continuity	
ыс	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0031, P0032	1	F67	3	E110	3	Existed
P0051, P0052	2	F68	3	- F110 –	4	LXISIGU

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

5.CHECK A/F SENSOR 1 HEATER

Refer to EC-758, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6.

6.REPLACE A/F SENSOR 1

Replace malfunctioning A/F sensor 1.

CAUTION:

 Discard any A/F sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.

[VK50VE]

EC

Α

D

Е

F

Н

N

Р

EC-757 Revision: 2009 March 2009 FX35/FX50

P0031, P0032, P0051, P0052 A/F SENSOR 1 HEATER

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

 Before installing new A/F sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J-43897-12)] and approved anti-seize lubricant (commercial service tool).

>> INSPECTION END

7.CHECK INTERMITTENT INCIDENT

Perform GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000003958690

1. CHECK AIR FUEL RATIO (A/F) SENSOR 1

- 1. Turn ignition switch OFF.
- 2. Disconnect air fuel ratio (A/F) sensor 1 harness connector.
- 3. Check resistance between A/F sensor 1 terminals as per the following.

Terminal	Resistance
3 and 4	1.98 - 2.66 Ω [at 25°C (77°F)]
3 and 1, 2	∞ Ω
4 and 1, 2	(Continuity should not exist)

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2. REPLACE A/F SENSOR 1

Replace malfunctioning A/F sensor 1.

CAUTION:

- Discard any A/F sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new A/F sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J-43897-12)] and approved anti-seize lubricant (commercial service tool).

>> INSPECTION END

P0037, P0038, P0057, P0058 HO2S2 HEATER

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Heated oxygen sensor 2 heater

Α

D

Е

Р

P0037, P0038, P0057, P0058 HO2S2 HEATER

Description INFOID:000000003958691

SYSTEM DESCRIPTION

Engine coolant temperature sensor

Sensor	Input signal to ECM	ECM function	Actuator	
Camshaft position sensor Crankshaft position sensor	Engine speed	Heated oxygen sensor 2	Heated awagen concer 2 heater	С

heater control

The ECM performs ON/OFF control of the heated oxygen sensor 2 heater corresponding to the engine speed, amount of intake air and engine coolant temperature.

Engine coolant temperature

Amount of intake air

OPERATION

Mass air flow sensor

Engine speed	Heated oxygen sensor 2 heater	F
Above 3,600 rpm	OFF	
Below 3,600 rpm after the following conditions are met. Engine: After warming up Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load	ON	G

DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0037	Heated oxygen sensor 2 heater (bank 1) control circuit low	The current amperage in the heated oxygen sensor 2 heater circuit is out of the normal range. (An excessively low voltage signal is sent to ECM through the heated oxygen sensor 2 heater.)	Harness or connectors (The heated oxygen sensor 2 heater circuit is open or shorted.) Heated oxygen sensor 2 heater
P0038	Heated oxygen sensor 2 heater (bank 1) control circuit high	The current amperage in the heated oxygen sensor 2 heater circuit is out of the normal range. (An excessively high voltage signal is sent to ECM through the heated oxygen sensor 2 heater.)	Harness or connectors (The heated oxygen sensor 2 heater circuit is shorted.) Heated oxygen sensor 2 heater
P0057	Heated oxygen sensor 2 heater (bank 2) control circuit low	The current amperage in the heated oxygen sensor 2 heater circuit is out of the normal range. (An excessively low voltage signal is sent to ECM through the heated oxygen sensor 2 heater.)	Harness or connectors (The heated oxygen sensor 2 heater circuit is open or shorted.) Heated oxygen sensor 2 heater
P0058	Heated oxygen sensor 2 heater (bank 2) control circuit high	The current amperage in the heated oxygen sensor 2 heater circuit is out of the normal range. (An excessively high voltage signal is sent to ECM through the heated oxygen sensor 2 heater.)	Harness or connectors (The heated oxygen sensor 2 heater circuit is shorted.) Heated oxygen sensor 2 heater

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 11 V at idle.

>> GO TO 2.

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine and warm it up to the normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Turn ignition switch ON.
- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- 6. Let engine idle for 1 minute.
- 7. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-760, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003958693

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- 2. Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2. CHECK HEATED OXYGEN SENSOR 2 (HO2S2) POWER SUPPLY CIRCUIT

- Disconnect heated oxygen sensor 2 (HO2S2) harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between HO2S2 harness connector and ground.

DTC	HO2S2			Ground	Voltage	
ы	Bank	Connector	Terminal	Ground	voitage	
P0037, P0038	1	F87	2	Ground	Battery voltage	
P0057, P0058	2	F88	2	Giodila	Battery voltage	

Is the inspection result normal?

YES >> GO TO 4. NO >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E10, F10
- IPDM E/R harness connector E7
- 15 A fuse (No. 46)
- Harness for open or short between heated oxygen sensor 2 and fuse

>> Repair open circuit, short to ground or short to power in harness or connectors.

4. CHECK HO2S2 OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- Disconnect ECM harness connector.
- 3. Check the continuity between HO2S2 harness connector and ECM harness connector.

DTC		HO2S2		E	ECM Contin	
ы	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0037, P0038	1	F87	3	F111	56	Existed
P0057, P0058	2	F88	3	1 111	55	LAISIEU

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

P0037, P0038, P0057, P0058 HO2S2 HEATER [VK50VE] < DTC/CIRCUIT DIAGNOSIS > YES >> GO TO 5. NO >> Repair open circuit, short to ground or short to power in harness or connectors. Α 5.CHECK HO2S2 HEATER Refer to EC-761, "Component Inspection". EC Is the inspection result normal? YES >> GO TO 7. NO >> GO TO 6. 6.REPLACE HEATED OXYGEN SENSOR 2 Replace malfunctioning heated oxygen sensor 2. **CAUTION:** D Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one. Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J-43897-12)] and approved anti-seize lubricant (commercial service tool). F >> INSPECTION END .CHECK INTERMITTENT INCIDENT Refer to GI-35, "Intermittent Incident". >> INSPECTION END Н Component Inspection INFOID:0000000003958694 1. CHECK HEATED OXYGEN SENSOR 2 HEATER Turn ignition switch OFF. Disconnect heated oxygen sensor 2 (HO2S2) harness connector. Check resistance between HO2S2 terminals as follows. **Terminal** Resistance 2 and 3 3.4 - 4.4 Ω [at 25°C (77°F)] 1 and 2, 3, 4 $\infty \Omega$ (Continuity should not exist) 4 and 1, 2, 3 Is the inspection result normal? YES >> INSPECTION END NO >> GO TO 2. M 2.replace heated oxygen sensor 2

Replace malfunctioning heated oxygen sensor 2.

CAUTION:

Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.

Ν

Р

 Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J-43897-12)] and approved anti-seize lubricant (commercial service tool).

>> INSPECTION END

Revision: 2009 March **EC-761** 2009 FX35/FX50

[VK50VE]

P0075, P0081 IVT CONTROL SOLENOID VALVE

Description

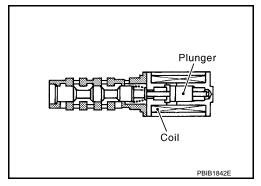
Intake valve timing control solenoid valve is activated by ON/OFF pulse duty (ratio) signals from the ECM.

The intake valve timing control solenoid valve changes the oil amount and direction of flow through intake valve timing control unit or stops oil flow.

The longer pulse width advances valve angle.

The shorter pulse width retards valve angle.

When ON and OFF pulse widths become equal, the solenoid valve stops oil pressure flow to fix the intake valve angle at the control position.



DTC Logic

INFOID:0000000003958696

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0075	Intake valve timing control solenoid valve (bank 1) circuit	An improper voltage is sent to the ECM	Harness or connectors (Intake valve timing control solenoid)
P0081	Intake valve timing control solenoid valve (bank 2) circuit	through intake valve timing control solenoid	valve circuit is open or shorted.) • Intake valve timing control solenoid valve

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine and let it idle for 5 seconds.
- 2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-762, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003958697

1. CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE POWER SUPPLY CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect intake valve timing (IVT) control solenoid valve harness connector.
- Turn ignition switch ON.
- 4. Check the voltage between IVT control solenoid valve harness connector and ground.

DTC -	IVT control solenoid valve			Ground	Voltage
	Bank	Connector	Terminal	Ground	voltage
P0075	1	F47	2	Ground	Battery voltage
P0081	2	F61	2	Ground	Battery voltage

P0075, P0081 IVT CONTROL SOLENOID VALVE [VK50VE] < DTC/CIRCUIT DIAGNOSIS > Is the inspection result normal? Α YES >> GO TO 3. NO >> GO TO 2. 2.DETECT MALFUNCTIONING PART EC Check the following. Harness connectors E10, F10 Harness for open or short between IVT control solenoid valve and IPDM E/R >> Repair open circuit, short to ground or short to power in harness or connectors. 3.check ivt control solenoid valve output signal circuit for open and short D Turn ignition switch OFF. 2. Disconnect ECM harness connector. Check the continuity between IVT control solenoid valve harness connector and ECM harness connector. IVT control solenoid valve **ECM** DTC Continuity F Bank Connector **Terminal** Connector **Terminal** F47 P0075 1 F111 Existed P0081 2 F61 52 4. Also check harness for short to ground and short to power. Is the inspection result normal? YES >> GO TO 4. NO >> Repair open circuit, short to ground or short to power in harness or connectors. 4.CHECK IVT CONTROL SOLENOID VALVE Refer to EC-763, "Component Inspection". Is the inspection result normal? YES >> GO TO 5. NO >> Replace malfunctioning IVT control solenoid valve. CHECK INTERMITTENT INCIDENT Refer to GI-35, "Intermittent Incident". >> INSPECTION END Component Inspection INFOID:00000000004032183 ${f 1}$.CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE-I M Turn ignition switch OFF. Disconnect intake valve timing control solenoid valve harness connector.

Check resistance between intake valve timing control solenoid valve terminals as per the following.

Terminals	Resistance
1 and 2	7.0 - 7.7 Ω [at 20°C (68°F)]
1 or 2 and ground	$\stackrel{\sim}{\sim} \Omega$ (Continuity should not exist)

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace malfunctioning intake valve timing control solenoid valve.

2.CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE-II

Remove intake valve timing control solenoid valve.

EC-763 Revision: 2009 March 2009 FX35/FX50

P0075, P0081 IVT CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

2. Provide 12 V DC between intake valve timing control solenoid valve terminals 1 and 2, and then interrupt it. Check that the plunger moves as shown in the figure.

CAUTION:

Never apply 12 V DC continuously for 5 seconds or more. Doing so may result in damage to the coil in intake valve timing control solenoid valve.

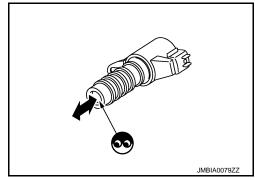
NOTE:

Always replace O-ring when intake valve timing control solenoid valve is removed.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace malfunctioning intake valve timing control solenoid valve.



[VK50VE]

P0078, P0084 EVT CONTROL SOLENOID VALVE

Description INFOID:0000000003958699

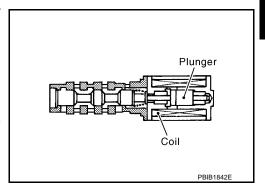
Exhaust valve timing control solenoid valve is activated by ON/OFF pulse duty (ratio) signals from the ECM.

The exhaust valve timing control solenoid valve changes the oil amount and direction of flow through exhaust valve timing control unit or stops oil flow.

The longer pulse width retards valve angle.

The shorter pulse width advances valve angle.

When ON and OFF pulse widths become equal, the solenoid valve stops oil pressure flow to fix the exhaust valve angle at the control position.



DTC Logic

INFOID:0000000003958700

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	G
P0078	Exhaust valve timing control solenoid valve (bank 1) circuit	An improper voltage is sent to the ECM	Harness or connectors (Exhaust valve timing control solenoid)	
P0084	Exhaust valve timing control solenoid valve (bank 2) circuit	through exhaust valve timing control solenoid valve.	valve circuit is open or shorted.) • Exhaust valve timing control solenoid valve	Н

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2 PERFORM DTC CONFIRMATION PROCEDURE

- Start engine and let it idle for 5 seconds.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-765, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

${f 1}$.CHECK EXHAUST VALVE TIMING CONTROL SOLENOID VALVE POWER SUPPLY CIRCUIT

- Turn ignition switch OFF.
- 2. Disconnect exhaust valve timing (EVT) control solenoid valve harness connector.
- Turn ignition switch ON.
- Check the voltage between EVT control solenoid valve harness connector and ground.

DTC	EVT	control solen	oid valve	Ground	Voltage
DIC	Bank	Connector	Terminal	Giodila	voltage
P0078	1	F46	2	Ground	Battery voltage
P0084	2	F62	2	Giodila	Dattery Voltage

EC-765 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

F

K

M

Ν

INFOID:000000000395870

Р

P0078, P0084 EVT CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 3. NO >> GO TO 2.

2.DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E10, F10
- Harness for open or short between EVT control solenoid valve and IPDM E/R
 - >> Repair open circuit, short to ground or short to power in harness or connectors.

3.check evt control solenoid valve output signal circuit for open and short

- 1. Turn ignition switch OFF.
- Disconnect ECM harness connector.
- Check the continuity between EVT control solenoid valve harness connector and ECM harness connector.

DTC	EVT control solenoid valve			E	Continuity	
ыс	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0078	1	F46	1	F111	61	Existed
P0084	2	F62	1	1 111	57	LAISIEU

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

4. CHECK EVT CONTROL SOLENOID VALVE

Refer to EC-766, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace malfunctioning EVT control solenoid valve.

${f 5.}$ CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000004032184

[VK50VE]

1. CHECK EXHAUST VALVE TIMING CONTROL SOLENOID VALVE-I

- 1. Turn ignition switch OFF.
- 2. Disconnect exhaust valve timing control solenoid valve harness connector.
- Check resistance between exhaust valve timing control solenoid valve terminals as per the following.

Terminals	Resistance
1 and 2	7.0 - 7.7 Ω [at 20°C (68°F)]
1 or 2 and ground	$\stackrel{\scriptstyle \sim \; \Omega}{\text{(Continuity should not exist)}}$

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace malfunctioning exhaust valve timing control solenoid valve.

2.CHECK EXHAUST VALVE TIMING CONTROL SOLENOID VALVE-II

1. Remove exhaust valve timing control solenoid valve.

P0078, P0084 EVT CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Provide 12 V DC between exhaust valve timing control solenoid valve terminals 1 and 2, and then interrupt it. Check that the plunger moves as shown in the figure.

CAUTION:

Do not apply 12 V DC continuously for 5 seconds or more. Doing so may result in damage to the coil in exhaust valve timing control solenoid valve.

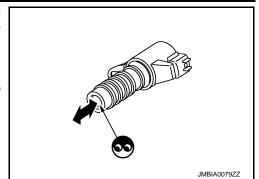
NOTE:

Always replace O-ring when exhaust valve timing control solenoid valve is removed.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace malfunctioning exhaust valve timing control solenoid valve.



EC

Α

С

D

Е

F

Н

Κ

L

M

Ν

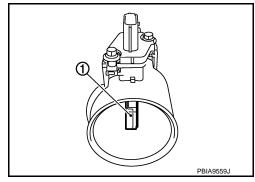
0

Р

Description INFOID.000000003958703

The mass air flow sensor (1) is placed in the stream of intake air. It measures the intake flow rate by measuring a part of the entire intake flow. The mass air flow sensor controls the temperature of the hot wire to a certain amount. The heat generated by the hot wire is reduced as the intake air flows around it. The greater air flow, the greater the heat loss.

Therefore, the electric current supplied to hot wire is changed to maintain the temperature of the hot wire as air flow increases. The ECM detects the air flow by means of this current change.



DTC Logic

INFOID:0000000003958704

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name		DTC detecting condition	Possible cause
	Mass air flow sensor	A)	A high voltage from the sensor is sent to ECM under light load driving condition.	Harness or connectors (The sensor circuit is open or shorted.) Mass air flow sensor EVAP control system pressure sensor
P0101	(bank 1) circuit range/ performance	B)	A low voltage from the sensor is sent to ECM under heavy load driving condition.	Harness or connectors (The sensor circuit is open or shorted.) Intake air leaks Mass air flow sensor EVAP control system pressure sensor Intake air temperature sensor
P010B (bank	Macc air flow concer	A)	A high voltage from the sensor is sent to ECM under light load driving condition.	Harness or connectors (The sensor circuit is open or shorted.) Mass air flow sensor EVAP control system pressure sensor
	Mass air flow sensor (bank 2) circuit range/ performance	B)	A low voltage from the sensor is sent to ECM under heavy load driving condition.	Harness or connectors (The sensor circuit is open or shorted.) Intake air leaks Mass air flow sensor EVAP control system pressure sensor Intake air temperature sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

NOTE:

If engine will not start or stops soon, wait at least 10 seconds with engine stopped (Ignition switch ON) instead of running engine at idle speed.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION A

- 1. Start engine and warm it up to normal operating temperature.
- 2. Run engine for at least 10 seconds at idle speed.
- Check 1st trip DTC.

[VK50VE] < DTC/CIRCUIT DIAGNOSIS >

Is 1st trip DTC detected?

YES >> Go to EC-770, "Diagnosis Procedure".

NO-1 >> With CONSULT-III: GO TO 3.

NO-2 >> With GST: GO TO 5.

3.CHECK MASS AIR FLOW SENSOR FUNCTION

(P) With CONSULT-III

- Turn ignition switch ON.
- Start engine and warm it up to normal operating temperature. If engine cannot be started, go to EC-770, "Diagnosis Procedure".

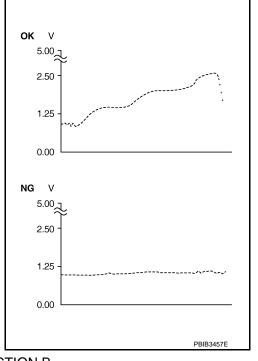
3. Select "MAS A/F SE-B1/B2" in "DATA MONITOR" mode with CONSULT-III.

- Check the voltage of "MAS A/F SE-B1/B2".
- 5. Increases engine speed to approximately 4,000 rpm.
- 6. Monitor the linear voltage rise in response to engine speed increases.

Is the inspection result normal?

>> GO TO 4. YES

NO >> Go to EC-770, "Diagnosis Procedure".



f 4.PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION B

Maintain the following conditions for at least 10 consecutive seconds.

ENG SPEED	More than 2,000 rpm
TP SEN 1-B1	More than 3 V
TP SEN 2-B1	More than 3 V
TP SEN 1-B2	More than 3 V
TP SEN 2-B2	More than 3 V
Selector lever	Suitable position
Driving location	Driving vehicle uphill (Increased engine load) will help maintain the driving conditions required for this test.

CAUTION:

Always drive vehicle at a safe speed.

Check 1st trip DTC.

Is 1st trip DTC detected?

YFS >> Go to EC-770, "Diagnosis Procedure".

NO >> INSPECTION END

${f 5.}$ PERFORM COMPONENT FUNCTION CHECK FOR MALFUNCTION B

With GST

Perform component function check. Refer to EC-770, "Component Function Check".

NOTE:

EC-769 Revision: 2009 March 2009 FX35/FX50

Α

EC

D

Е

Ν

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Use component function check to check the overall function of the mass air flow sensor circuit. During this check, a 1st trip DTC might not be confirmed.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-770, "Diagnosis Procedure".

Component Function Check

INFOID:0000000003958705

1. PERFORM COMPONENT FUNCTION CHECK FOR MALFUNCTION B

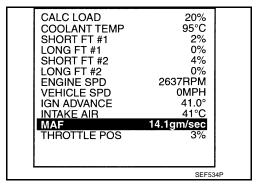
With GST

- 1. Start engine and warm it up to normal operating temperature.
- Select Service \$01 with GST.
- 3. Check the mass air flow sensor signal with Service \$01.
- Check for linear mass air flow sensor signal value rise in response to increases to approximately 4,000 rpm in engine speed.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-770, "Diagnosis Procedure".



Diagnosis Procedure

INFOID:0000000003958706

1. INSPECTION START

Confirm the detected malfunction (A or B). Refer to EC-768, "DTC Logic".

Which malfunction is detected?

A >> GO TO 3.

B >> GO TO 2.

2. CHECK INTAKE SYSTEM

Check the following for connection.

- Air duct
- Vacuum hoses
- Intake air passage between air duct and intake manifold

Is the inspection result normal?

YES >> GO TO 3.

NO >> Reconnect the parts.

3.check ground connection

- 1. Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace ground connection.

4. CHECK MASS AIR FLOW SENSOR POWER SUPPLY CIRCUIT

- Disconnect mass air flow (MAF) sensor harness connector.
- Turn ignition switch ON.
- Check the voltage between MAF sensor harness connector and ground.

DTC		MAF sens	or	Ground	Voltage	
Bank		Connector	Terminal	Giodila	voltage	
P0101	1	F86	5	Ground	Battery voltage	
P010B	2	F85	5	Orouna	Dattery Voltage	

EC

Α

Is the inspection result normal?

YES >> GO TO 6. NO >> GO TO 5.

DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E106, M6
- Harness connectors M116, F103
- Harness for open or short between mass air flow sensor and ECM
- Harness for open or short between mass air flow sensor and IPDM E/R

>> Repair open circuit, short to ground or short to power in harness or connectors.

6.CHECK MAF SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check the continuity between MAF sensor harness connector and ECM harness connector.

DTC	MAF sensor			ECM		Continuity
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0101	1	F86	4	F110	42	Existed
P010B	2	F85	4	FIIU	38	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 7.

>> Repair open circuit, short to ground or short to power in harness or connectors.

.CHECK MAF SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

Check the continuity between MAF sensor harness connector and ECM harness connector.

DTC	MAF sensor			ECM		Continuity
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0101	1	F86	3	F110	47	Existed
P010B	2	F85	3	1110	43	LXISIEU

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

8. CHECK INTAKE AIR TEMPERATURE SENSOR

Check intake air temperature sensor.

Refer to EC-782, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace mass air flow sensor (bank 1) (with intake air temperature sensor).

9.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-911, "Component Inspection".

EC-771 Revision: 2009 March 2009 FX35/FX50

Е

Н

K

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Is the inspection result normal?

YES >> GO TO 10.

NO >> Replace EVAP control system pressure sensor.

10. CHECK MASS AIR FLOW SENSOR

Refer to EC-772, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 11.

NO >> Replace malfunctioning mass air flow sensor.

11. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000003958707

1. CHECK MASS AIR FLOW SENSOR-I

- (P) With CONSULT-III
- 1. Turn ignition switch OFF.
- Reconnect all harness connectors disconnected.
- 3. Start engine and warm it up to normal operating temperature.
- 4. Connect CONSULT-III and select "DATA MONITOR" mode.
- 5. Select "MAS A/F SE-B1" and "MAS A/F SE-B2", and check the indication.

Monitor item	Condition	Indication (V)
	Ignition switch ON (Engine stopped.)	Approx. 0.4
MAS A/F SE-B1	Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1
MAS A/F SE-B2	2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7
	Idle to approx. 4,000 rpm	0.8 - 1.1 to approx. 2.4*

^{*:} Check for linear voltage rise in response to engine being increased to approximately 4,000 rpm.

₩ Without CONSULT-III

- 1. Turn ignition switch OFF.
- 2. Reconnect all harness connectors disconnected.
- 3. Start engine and warm it up to normal operating temperature.
- 4. Check the voltage between ECM harness connector terminals under the following conditions.

	ECM				
Connector	+	_	Condition	Voltage (V)	
Connector	Connector Terminal				
			Ignition switch ON (Engine stopped.)	Approx. 0.4	
	47	42	Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1	
[MAF sensor (bank 1) signal]	(bank 1) signal]		2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7	
F110			Idle to approx. 4,000 rpm	0.8 - 1.1 to approx. 2.4*	
FIIU			Ignition switch ON (Engine stopped.)	Approx. 0.4	
	43		Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1	
[MAF sensor (bank 2) signal]	38	2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7		
			Idle to approx. 4,000 rpm	0.8 - 1.1 to approx. 2.4*	

^{*:} Check for linear voltage rise in response to engine being increased to approximately 4,000 rpm.

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Is the inspection result normal?

YES >> GO TO 4. NO >> GO TO 2.

2.check for the cause of uneven air flow through mass air flow sensor

- Turn ignition switch OFF.
- Check for the cause of uneven air flow through mass air flow sensor. Refer to the following.
- Crushed air ducts
- Malfunctioning seal of air cleaner element
- Uneven dirt of air cleaner element
- Improper specification of intake air system parts

Is the inspection result normal?

YFS >> GO TO 4. NO >> GO TO 3.

3. CHECK MASS AIR FLOW SENSOR-II

(P) With CONSULT-III

- 1. Repair or replace malfunctioning part.
- Start engine and warm it up to normal operating temperature.
- Connect CONSULT-III and select "DATA MONITOR" mode.
- 4. Select "MAS A/F SE-B1" and "MAS A/F SE-B2", and check the indication.

Monitor item	Condition	Indication (V)
	Ignition switch ON (Engine stopped.)	Approx. 0.4
MAS A/F SE-B1	Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1
MAS A/F SE-B2	2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7
	Idle to approx. 4,000 rpm	0.8 - 1.1 to approx. 2.4*

^{*:} Check for linear voltage rise in response to engine being increased to approximately 4,000 rpm.

Without CONSULT-III

- Repair or replace malfunctioning part.
- Start engine and warm it up to normal operating temperature.
- Check the voltage between ECM harness connector terminals under the following conditions.

	ECM				
Connector	+	_	Condition	Voltage (V)	
Connector	Connector Terminal				
			Ignition switch ON (Engine stopped.)	Approx. 0.4	
	47		Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1	
	[MAF sensor (bank 1) signal]	42	2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7	
F110			Idle to approx. 4,000 rpm	0.8 - 1.1 to approx. 2.4*	
FIIU		Ignition	Ignition switch ON (Engine stopped.)	Approx. 0.4	
43 [MAF sensor (bank 2) signal]	-	Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1		
	0.500 /5		2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7	
			Idle to approx. 4,000 rpm	0.8 - 1.1 to approx. 2.4*	

^{*:} Check for linear voltage rise in response to engine being increased to approximately 4,000 rpm.

Is the inspection result normal?

YES >> INSPECTION END NO >> GO TO 4.

4. CHECK MASS AIR FLOW SENSOR-III

Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

F

Н

Ν

EC-773

(II) With CONSULT-III

- 1. Turn ignition switch OFF.
- 2. Disconnect mass air flow sensor harness connector and reconnect it again.
- 3. Start engine and warm it up to normal operating temperature.
- 4. Connect CONSULT-III and select "DATA MONITOR" mode.
- 5. Select "MAS A/F SE-B1" and "MAS A/F SE-B2", and check the indication.

Monitor item	Condition	Indication (V)
	Ignition switch ON (Engine stopped.)	Approx. 0.4
MAS A/F SE-B1 MAS A/F SE-B2	Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1
	2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7
	Idle to approx 4,000 rpm	0.8 - 1.1 to approx. 2.4*

^{*:} Check for linear voltage rise in response to engine being increased to approximately 4,000 rpm.

- 1. Turn ignition switch OFF.
- 2. Disconnect mass air flow sensor harness connector and reconnect it again.
- 3. Start engine and warm it up to normal operating temperature.
- 4. Check the voltage between ECM harness connector terminals under the following conditions.

	ECM				
Connector	+	-	Condition	Voltage (V)	
Connector	Terminal	Terminal			
			Ignition switch ON (Engine stopped.)	Approx. 0.4	
	47	[MAF sensor 42	Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1	
	(bank 1) signal]		2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7	
F110			Idle to approx. 4,000 rpm	0.8 - 1.1 to approx. 2.4*	
FIIU	43			Ignition switch ON (Engine stopped.)	Approx. 0.4
				Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1
[MAF sensor (bank 2) signal]	38	2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7		
			Idle to approx. 4,000 rpm	0.8 - 1.1 to approx. 2.4*	

^{*:} Check for linear voltage rise in response to engine being increased to approximately 4,000 rpm.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Clean or replace malfunctioning mass air flow sensor.

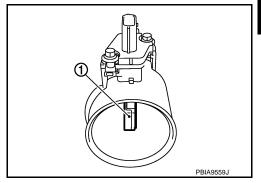
[VK50VE]

P0102, P0103, P010C, P010D MAF SENSOR

Description INFOID:0000000003958708

The mass air flow sensor (1) is placed in the stream of intake air. It measures the intake flow rate by measuring a part of the entire intake flow. The mass air flow sensor controls the temperature of the hot wire to a certain amount. The heat generated by the hot wire is reduced as the intake air flows around it. The greater air flow, the greater the heat loss.

Therefore, the electric current supplied to hot wire is changed to maintain the temperature of the hot wire as air flow increases. The ECM detects the air flow by means of this current change.



DTC Logic INFOID:0000000003958709

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0102	Mass air flow sensor (bank 1) circuit low input	An excessively low voltage from the sensor is sent to ECM.	Harness or connectors (The sensor circuit is open or shorted.) Intake air leaks Mass air flow sensor
P0103	Mass air flow sensor (bank 1) circuit high input	An excessively high voltage from the sensor is sent to ECM.	Harness or connectors (The sensor circuit is open or shorted.) Mass air flow sensor
P010C	Mass air flow sensor (bank 2) circuit low input	An excessively low voltage from the sensor is sent to ECM.	Harness or connectors (The sensor circuit is open or shorted.) Intake air leaks Mass air flow sensor
P010D	Mass air flow sensor (bank 2) circuit high input	An excessively high voltage from the sensor is sent to ECM.	Harness or connectors (The sensor circuit is open or shorted.) Mass air flow sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

Which DTC is detected?

P0102, P010C>>GO TO 2.

P0103, P010D>>GO TO 3.

2.PERFORM DTC CONFIRMATION PROCEDURE FOR DTC P0102 AND P010C

- Start engine and wait at least 5 seconds.
- Check DTC. 2.

Is DTC detected?

YES >> Go to EC-776, "Diagnosis Procedure".

NO >> INSPECTION END

3.PERFORM DTC CONFIRMATION PROCEDURE FOR DTC P0103 AND P010D-I

- Turn ignition switch ON and wait at least 5 seconds.
- 2. Check DTC.

Is DTC detected?

EC-775 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

F

M

Ν

Р

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

YES >> Go to EC-776, "Diagnosis Procedure".

NO >> GO TO 4.

f 4. PERFORM DTC CONFIRMATION PROCEDURE FOR DTC P0103 AND P010D-II

- 1. Start engine and wait at least 5 seconds.
- 2. Check DTC.

Is DTC detected?

YES >> Go to EC-776, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003958710

1.INSPECTION START

Confirm the detected DTC.

Which DTC is detected?

P0102, P010C>>GO TO 2.

P0103, P010D>>GO TO 3.

2.CHECK INTAKE SYSTEM

Check the following for connection.

- · Air duct
- Vacuum hoses
- Intake air passage between air duct to intake manifold

Is the inspection result normal?

YES >> GO TO 3.

NO >> Reconnect the parts.

3.check ground connection

- Turn ignition switch OFF.
- 2. Check ground connection M95. Refer to Ground Inspection in GI-38. "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace ground connection.

4. CHECK MASS AIR FLOW SENSOR POWER SUPPLY CIRCUIT

- 1. Disconnect mass air flow (MAF) sensor harness connector.
- Turn ignition switch ON.
- 3. Check the voltage between MAF sensor harness connector and ground.

DTC		MAF sens	or	Ground	Voltage
ы	Bank	Connector	Terminal	Ground	
P0102, P0103	1	F86	5	Ground	Battery voltage
P010C, P010D	2	F85	5	Giodila	Ballery Vollage

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 5.

DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E106, M6
- Harness connectors M116, F103
- Harness for open or short between mass air flow sensor and ECM
- Harness for open or short between mass air flow sensor and IPDM E/R

>> Repair open circuit, short to ground or short to power in harness or connectors.

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

6.check maf sensor ground circuit for open and short

- Turn ignition switch OFF.
- Disconnect ECM harness connector.
- Check the continuity between MAF sensor harness connector and ECM harness connector.

DTC		MAF senso	or	EC	Continuity	
ыс	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0102, P0103	1	F86	4	F110	42	Existed
P010C, P010D	2	F85	4	1 110	38	LAISIGU

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

7.CHECK MAF SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

Check the continuity between MAF sensor harness connector and ECM harness connector.

DTC	MAF sensor			EC	Continuity	
ыс	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0102, P0103	1	F86	3	F110	47	Existed
P010C, P010D	2	F85	3	1 110	43	LAISIEU

Also check harness for short to ground and short to power.

Is the inspection result normal?

>> GO TO 8. YES

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

8.CHECK MASS AIR FLOW SENSOR

Refer to EC-777, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace malfunctioning mass air flow sensor.

9. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

1.CHECK MASS AIR FLOW SENSOR-I

- (P) With CONSULT-III
- Turn ignition switch OFF.
- Reconnect all harness connectors disconnected.
- 3. Start engine and warm it up to normal operating temperature.
- Connect CONSULT-III and select "DATA MONITOR" mode.
- Select "MAS A/F SE-B1" and "MAS A/F SE-B2", and check the indication.

Monitor item	Condition	Indication (V)
MAS A/F SE-B1 MAS A/F SE-B2	Ignition switch ON (Engine stopped.)	Approx. 0.4
	Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1
	2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7
	Idle to approx. 4,000 rpm	0.8 - 1.1 to approx. 2.4*

EC-777 Revision: 2009 March 2009 FX35/FX50

EC

Е

K

M

INFOID:0000000004032185

Ν

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

*: Check for linear voltage rise in response to engine being increased to approximately 4,000 rpm.

₩ Without CONSULT-III

- Turn ignition switch OFF.
- 2. Reconnect all harness connectors disconnected.
- 3. Start engine and warm it up to normal operating temperature.
- Check the voltage between ECM harness connector terminals under the following conditions.

	ECM						
Connector	+	_	Condition	Voltage (V)			
Connector	Terminal	Terminal					
			Ignition switch ON (Engine stopped.)	Approx. 0.4			
	47 [MAF sensor (bank 1) signal]	42	Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1			
		42	2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7			
F110			Idle to approx. 4,000 rpm	0.8 - 1.1 to approx. 2.4*			
FIIU	43 [MAF sensor (bank 2) signal]					Ignition switch ON (Engine stopped.)	Approx. 0.4
		43 [MAF sensor 38 – (bank 2) signal]	Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1			
			2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7			
			Idle to approx. 4,000 rpm	0.8 - 1.1 to approx. 2.4*			

^{*:} Check for linear voltage rise in response to engine being increased to approximately 4,000 rpm.

Is the inspection result normal?

YES >> GO TO 4. NO >> GO TO 2.

2.check for the cause of uneven air flow through mass air flow sensor

- 1. Turn ignition switch OFF.
- 2. Check for the cause of uneven air flow through mass air flow sensor. Refer to the following.
- Crushed air ducts
- Malfunctioning seal of air cleaner element
- Uneven dirt of air cleaner element
- Improper specification of intake air system parts

Is the inspection result normal?

YES >> GO TO 4. NO >> GO TO 3.

3.CHECK MASS AIR FLOW SENSOR-II

(II) With CONSULT-III

- Repair or replace malfunctioning part.
- 2. Start engine and warm it up to normal operating temperature.
- 3. Connect CONSULT-III and select "DATA MONITOR" mode.
- Select "MAS A/F SE-B1" and "MAS A/F SE-B2", and check the indication.

Monitor item	Condition	Indication (V)
	Ignition switch ON (Engine stopped.)	Approx. 0.4
MAS A/F SE-B1 MAS A/F SE-B2	Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1
	2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7
	Idle to approx. 4,000 rpm	0.8 - 1.1 to approx. 2.4*

^{*:} Check for linear voltage rise in response to engine being increased to approximately 4,000 rpm.

(X) Without CONSULT-III

- Repair or replace malfunctioning part.
- Start engine and warm it up to normal operating temperature.

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

3. Check the voltage between ECM harness connector terminals under the following conditions.

	ECM					
Connector	+	-	Condition	Voltage (V)		
Connector	Terminal	Terminal				
			Ignition switch ON (Engine stopped.)	Approx. 0.4		
	47 [MAF sensor (bank 1) signal]	42	Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1		
			2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7		
F110			Idle to approx. 4,000 rpm	0.8 - 1.1 to approx. 2.4*		
FIIU	43 [MAF sensor (bank 2) signal]		Ignition switch ON (Engine stopped.)	Approx. 0.4		
				perature.)	Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1
		30	2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7		
			Idle to approx. 4,000 rpm	0.8 - 1.1 to approx. 2.4*		

^{*:} Check for linear voltage rise in response to engine being increased to approximately 4,000 rpm.

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 4.

4.CHECK MASS AIR FLOW SENSOR-III

- (II) With CONSULT-III
- Turn ignition switch OFF.
- 2. Disconnect mass air flow sensor harness connector and reconnect it again.
- 3. Start engine and warm it up to normal operating temperature.
- 4. Connect CONSULT-III and select "DATA MONITOR" mode.
- 5. Select "MAS A/F SE-B1" and "MAS A/F SE-B2", and check the indication.

Monitor item	Condition	Indication (V)
MAS A/F SE-B1 MAS A/F SE-B2	Ignition switch ON (Engine stopped.)	Approx. 0.4
	Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1
	2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7
	Idle to approx 4,000 rpm	0.8 - 1.1 to approx. 2.4*

^{*:} Check for linear voltage rise in response to engine being increased to approximately 4,000 rpm.

Without CONSULT-III

- 1. Turn ignition switch OFF.
- 2. Disconnect mass air flow sensor harness connector and reconnect it again.
- 3. Start engine and warm it up to normal operating temperature.
- 4. Check the voltage between ECM harness connector terminals under the following conditions.

EC

Α

D

Е

F

G

Н

10

Ν

F

	ECM							
Connector	+	-	Condition	Voltage (V)				
Connector	Terminal	Terminal						
			Ignition switch ON (Engine stopped.)	Approx. 0.4				
	47	AF sensor 42	Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1				
[MAF sensor (bank 1) signal]	•		2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7				
F110			Idle to approx. 4,000 rpm	0.8 - 1.1 to approx. 2.4*				
FIIU	43					Ignition sv	Ignition switch ON (Engine stopped.)	Approx. 0.4
			Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1				
[MAF sensor (bank 2) signal]	38	2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7					
			Idle to approx. 4,000 rpm	0.8 - 1.1 to approx. 2.4*				

^{*:} Check for linear voltage rise in response to engine being increased to approximately 4,000 rpm.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Clean or replace malfunctioning mass air flow sensor.

[VK50VE]

Α

EC

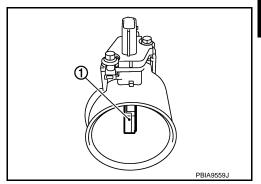
D

P0112, P0113 IAT SENSOR

Description

The intake air temperature sensor is built-into the mass air flow sensor (1). The sensor detects intake air temperature and transmits a signal to the ECM.

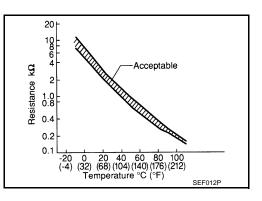
The temperature sensing unit uses a thermistor which is sensitive to the change in temperature. Electrical resistance of the thermistor decreases in response to the rise in temperature.



<Reference data>

Intake air temperature [°C (°F)]	Voltage* (V)	Resistance (kΩ)
25 (77)	3.3	1.800 - 2.200
80 (176)	1.2	0.283 - 0.359

^{*:} These data are reference values and are measured between ECM terminals 48 (Intake air temperature sensor) and 42 (Sensor ground).



INFOID:0000000003958713

DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0112	Intake air temperature sensor circuit low input	An excessively low voltage from the sensor is sent to ECM.	Harness or connectors (The sensor circuit is open or shorted.)
P0113	Intake air temperature sensor circuit high input	An excessively high voltage from the sensor is sent to ECM.	(The sensor circuit is open or shortedIntake air temperature sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Turn ignition switch ON and wait at least 5 seconds.
- 2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-782, "Diagnosis Procedure".

NO >> INSPECTION END

M

Ν

0

IVK50VE

< DTC/CIRCUIT DIAGNOSIS >

Diagnosis Procedure

INFOID:0000000003958714

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- 2. Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2. CHECK INTAKE AIR TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

- Disconnect mass air flow (MAF) sensor (bank 1) (intake air temperature sensor is built-in) harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between MAF sensor (bank 1) harness connector and ground.

MAF sensor (bank 1)		Ground	Voltage (V)
Connector	Connector Terminal		
F86	2	Ground	Approx. 5

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

3.check intake air temperature sensor ground circuit for open and short

- Turn ignition switch OFF.
- Disconnect ECM harness connector.
- 3. Check the continuity between MAF sensor (bank 1) harness connector and ECM harness connector.

MAF sensor (bank 1)		ECM		Continuity
Connector	Terminal	Connector Terminal		Continuity
F86	1	F110	42	Existed

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

4. CHECK INTAKE AIR TEMPERATURE SENSOR

Refer to EC-782, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace mass air flow sensor (bank 1) (with intake air temperature sensor).

5.CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000003958715

1. CHECK INTAKE AIR TEMPERATURE SENSOR

- Turn ignition switch OFF.
- Disconnect mass air flow sensor (bank 1) harness connector.
- Check resistance between mass air flow sensor (bank 1) terminals as per the following.

P0112, P0113 IAT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Terminals	Condition		Resistance (kΩ)
1 and 2	Temperature [°C (°F)]	25 (77)	1.800 - 2.200

Α

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace mass air flow sensor (bank 1) (with intake air temperature sensor).

EC

С

D

Е

F

G

Н

K

L

M

Ν

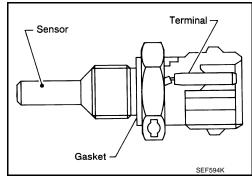
0

Р

P0116 ECT SENSOR

Description INFOID.000000003959770

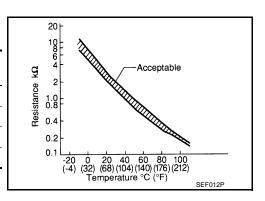
The engine coolant temperature sensor is used to detect the engine coolant temperature. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the engine coolant temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.



<Reference data>

Engine coolant temperature [°C (°F)]	Voltage* (V)	Resistance (kΩ)
-10 (14)	4.4	7.0 - 11.4
20 (68)	3.5	2.37 - 2.63
50 (122)	2.2	0.68 - 1.00
90 (194)	0.9	0.236 - 0.260

^{*:} These data are reference values and are measured between ECM terminals 24 (Engine coolant temperature sensor) and 23 (Sensor ground).



INFOID:0000000003977523

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P0116 is displayed with P0117 or P0118, first perform the trouble diagnosis for DTC P0117, P0118. Refer to EC-786, "DTC Logic".

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0116	Engine coolant temperature sensor circuit range/performance	Engine coolant temperature signal from engine coolant temperature sensor does not fluctuate, even when some time has passed after starting the engine with pre-warming up condition.	Harness or connectors (High or low resistance in the circuit) Engine coolant temperature sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TEST CONDITION:

Before performing the following procedure, do not add fuel.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine and warm it up to normal operating temperature.
- 2. Rev engine up to 2,000 rpm for more than 10 minutes.
- 3. Move the vehicle to a cool place, then stop engine.

P0116 ECT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Check resistance between "fuel level sensor unit and fuel pump (main)" terminals 4 and 5.

Soak the vehicle until the resistance between "fuel level sensor unit and fuel pump (main)" terminals 4 and 5 becomes 0.5 $k\Omega$ higher than the value measured before soaking.

CAUTION:

Never turn ignition switch ON during soaking.

NOTE:

Soak time changes depending on ambient air temperature. It may take several hours.

- 6. Start engine and let it idle for 5 minutes.
- 7. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-785, "Diagnosis Procedure".

>> INSPECTION END NO

Diagnosis Procedure

1. CHECK GROUND CONNECTIONS

Turn ignition switch OFF.

Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

OK >> GO TO 2.

NG >> Repair or replace ground connections.

2.CHECK ENGINE COOLANT TEMPERATURE SENSOR

Refer to EC-785, "Component Inspection".

Is the inspection result normal?

OK >> GO TO 3.

NG >> Replace engine coolant temperature sensor.

3. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

1. CHECK ENGINE COOLANT TEMPERATURE SENSOR

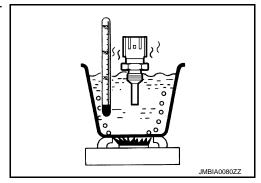
- Turn ignition switch OFF.
- 2. Disconnect engine coolant temperature sensor harness connector.
- Remove engine coolant temperature sensor.
- Check resistance between engine coolant temperature sensor terminals by heating with hot water as shown in the figure.

Terminals	Condition		Resistance (k Ω)
		20 (68)	2.37 - 2.63
1 and 2	Temperature [°C (°F)]	50 (122)	0.68 - 1.00
		90 (194)	0.236 - 0.260

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace engine coolant temperature sensor.



EC

INFOID:0000000003959773

F

Е

Н

INFOID:0000000003959774

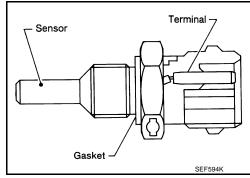
N

EC-785 Revision: 2009 March 2009 FX35/FX50

P0117, P0118 ECT SENSOR

Description INFOID:000000004032219

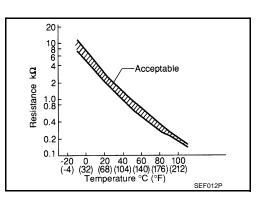
The engine coolant temperature sensor is used to detect the engine coolant temperature. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the engine coolant temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.



<Reference data>

Engine coolant temperature [°C (°F)]	Voltage* (V)	Resistance (kΩ)
-10 (14)	4.4	7.0 - 11.4
20 (68)	3.5	2.37 - 2.63
50 (122)	2.2	0.68 - 1.00
90 (194)	0.9	0.236 - 0.260

^{*:} These data are reference values and are measured between ECM terminals 24 (Engine coolant temperature sensor) and 23 (Sensor ground).



INFOID:0000000003958717

DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0117	Engine coolant temperature sensor circuit low input	An excessively low voltage from the sensor is sent to ECM.	Harness or connectors (The sensor circuit is open or shorted.)
P0118	Engine coolant temperature sensor circuit high input	An excessively high voltage from the sensor is sent to ECM.	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Turn ignition switch ON and wait at least 5 seconds.
- 2. Check DTC.

Is DTC detected?

YES >> Go to EC-787, "Diagnosis Procedure".

NO >> INSPECTION END

P0117, P0118 ECT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

INFOID:0000000003958718

Diagnosis Procedure

1. CHECK GROUND CONNECTION Turn ignition switch OFF.

Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK ENGINE COOLANT TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

- Disconnect engine coolant temperature (ECT) sensor harness connector.
- 2. Turn ignition switch ON.
- Check the voltage between ECT sensor harness connector and ground.

ECT sensor		Ground	Voltage (V)
Connector Terminal			
F17	1	Ground	Approx. 5

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

3.check ect sensor ground circuit for open and short

- Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check the continuity between ECT sensor harness connector and ECM harness connector.

ECT s	ECT sensor ECM		ECM	
Connector	Terminal	Connector Terminal		Continuity
F17	2	F110	23	Existed

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

f 4.CHECK ENGINE COOLANT TEMPERATURE SENSOR

Refer to EC-787, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace engine coolant temperature sensor.

5. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

1. CHECK ENGINE COOLANT TEMPERATURE SENSOR

Turn ignition switch OFF.

Component Inspection

- Disconnect engine coolant temperature sensor harness connector.
- Remove engine coolant temperature sensor.

Α

EC

D

Е

M

INFOID:0000000004032220

Р

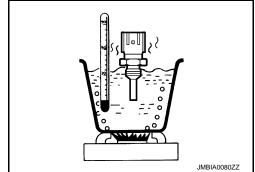
P0117, P0118 ECT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

4. Check resistance between engine coolant temperature sensor terminals by heating with hot water as shown in the figure.

Terminals	Condition		Resistance (kΩ)
		20 (68)	2.37 - 2.63
1 and 2	Temperature [°C (°F)]	50 (122)	0.68 - 1.00
		90 (194)	0.236 - 0.260



Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace engine coolant temperature sensor.

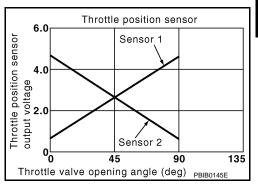
[VK50VE]

P0122, P0123, P0227, P0228 TP SENSOR

Description INFOID:0000000003958720

Electric throttle control actuator consists of throttle control motor, throttle position sensor, etc. The throttle position sensor responds to the throttle valve movement.

The throttle position sensor has two sensors. These sensors are a kind of potentiometer which transform the throttle valve position into output voltage, and emit the voltage signal to the ECM. The ECM judges the current opening angle of the throttle valve from these signals and controls the throttle valve opening angle in response to driving conditions via the throttle control motor.



DTC Logic INFOID:000000000395872

DTC DETECTION LOGIC

NOTE:

If DTC P0122, P0123, P0227 or P0228 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. Refer to EC-959, "DTC Logic".

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0122	Throttle position sensor 2 (bank 1) circuit low input	An excessively low voltage from the TP sensor 2 is sent to ECM.	
P0123	Throttle position sensor 2 (bank 1) circuit high input	An excessively high voltage from the TP sensor 2 is sent to ECM.	Harness or connectors (TP sensor 2 circuit is open or shorted.)
P0227	Throttle position sensor 2 (bank 2) circuit low input	An excessively low voltage from the TP sensor 2 is sent to ECM.	Electric throttle control actuator (TP sensor 2)
P0228	Throttle position sensor 2 (bank 2) circuit high input	An excessively high voltage from the TP sensor 2 is sent to ECM.	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 8 V at idle.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- Start engine and let it idle for 1 second.
- Check DTC.

Is DTC detected?

YES >> Go to EC-789, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1. CHECK GROUND CONNECTION

- Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

EC

Α

Е

F

Н

K

N

2009 FX35/FX50

INFOID:0000000003958722

P0122, P0123, P0227, P0228 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK THROTTLE POSITION SENSOR 2 POWER SUPPLY CIRCUIT-I

- 1. Disconnect electric throttle control actuator harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between electric throttle control actuator harness connector and ground.

DTC	Electric throttle control actuator			Ground	Voltage (V)
DIO	Bank	Connector	Terminal	Ground	voltage (v)
P0122, P0123	1	F66	2	Ground	Approx. 5
P0227, P0228	2	F64	2	Ground	дрріох. 3

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

3.CHECK THROTTLE POSITION SENSOR 2 GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- Disconnect ECM harness connector.
- Check the continuity between electric throttle control actuator harness connector and ECM harness connector.

DTC	Electri	Electric throttle control actuator		ECM		Continuity
ы	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0122, P0123	1	F66	4	F111	71	Existed
P0227, P0228	2	F64	4	1 111	72	LAISIEU

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

4.CHECK THROTTLE POSITION SENSOR 2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

Check the continuity between electric throttle control actuator harness connector and ECM harness connector.

DTC	Electri	Electric throttle control actuator		ECM		Continuity
ыс	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0122, P0123	1	F66	3	F111	78	Existed
P0227, P0228	2	F64	3	1 111	74	LAISIEU

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

5. CHECK THROTTLE POSITION SENSOR

Refer to EC-791, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6.

6. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

1. Replace malfunctioning electric throttle control actuator.

P0122, P0123, P0227, P0228 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

INFOID:0000000003958723

Perform EC-582, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement".

>> INSPECTION END

7. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

1. CHECK THROTTLE POSITION SENSOR

- Turn ignition switch OFF.
- Reconnect all harness connectors disconnected. 2.
- Perform EC-582, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement".
- Turn ignition switch ON. 4.
- Set selector lever position to D.
- Check the voltage between ECM harness connector terminals under the following conditions.

ECM				
Connector	+	_	Condition	Voltage (V)
Connector	Terminal Terminal			
	73	71	Accelerator pedal: Fully released	More than 0.36
	[TP sensor 1 (bank 1)] 71		Accelerator pedal: Fully depressed	Less than 4.75
İ	77	72	Accelerator pedal: Fully released	More than 0.36
F111	[TP sensor 1 (bank 2)]		Accelerator pedal: Fully depressed	Less than 4.75
FIII	78	71	Accelerator pedal: Fully released	Less than 4.75
	[TP sensor 2 (bank 1)]	71	Accelerator pedal: Fully depressed	More than 0.36
İ	74	72	Accelerator pedal: Fully released	Less than 4.75
	[TP sensor 2 (bank 2)]	12	Accelerator pedal: Fully depressed	More than 0.36

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.replace electric throttle control actuator

- Replace malfunctioning electric throttle control actuator.
- Perform EC-582, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement".

>> INSPECTION END

Special Repair Requirement

 ${f 1}$.PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Refer to EC-582, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement"

>> GO TO 2.

2.PERFORM IDLE AIR VOLUME LEARNING

Refer to EC-583, "IDLE AIR VOLUME LEARNING: Special Repair Requirement"

>> END

EC

Α

D

F

Е

Н

K

Ν

INFOID:0000000003958724

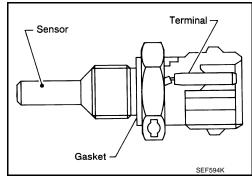
Р

EC-791 Revision: 2009 March

P0125 ECT SENSOR

Description INFOID:000000004032221

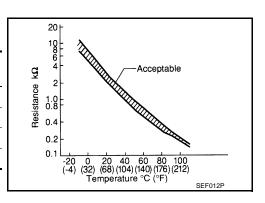
The engine coolant temperature sensor is used to detect the engine coolant temperature. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the engine coolant temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.



<Reference data>

Engine coolant temperature [°C (°F)]	Voltage* (V)	Resistance (kΩ)
-10 (14)	4.4	7.0 - 11.4
20 (68)	3.5	2.37 - 2.63
50 (122)	2.2	0.68 - 1.00
90 (194)	0.9	0.236 - 0.260

^{*:} These data are reference values and are measured between ECM terminals 24 (Engine coolant temperature sensor) and 23 (Sensor ground).



INFOID:0000000003958726

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P0125 is displayed with P0117 or P0118, first perform the trouble diagnosis for DTC P0117, P0118. Refer to EC-786, "DTC Logic".

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0125	Insufficient engine coolant temperature for closed loop fuel control	 Voltage sent to ECM from the sensor is not practical, even when some time has passed after starting the engine. Engine coolant temperature is insufficient for closed loop fuel control. 	Harness or connectors (High resistance in the circuit) Engine coolant temperature sensor Thermostat

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2. CHECK ENGINE COOLANT TEMPERATURE SENSOR FUNCTION

- (II) With CONSULT-III
- 1. Turn ignition switch ON.
- Select "DATA MONITOR" mode with CONSULT-III.
- 3. Check that "COOLAN TEMP/S" is above 10°C (50°F).

Revision: 2009 March **EC-792** 2009 FX35/FX50

P0125 ECT SENSOR

< DTC/CIRCUIT DIAGNOSIS >	[VK50VE]
With GST	
Follow the procedure "With CONSULT-III" above.	A
Is the temperature above 10°C (50°F)?	
YES >> INSPECTION END NO >> GO TO 3.	EC
3. PERFORM DTC CONFIRMATION PROCEDURE	
With CONSULT-IIIStart engine and run it for 65 minutes at idle speed.	С
If "COOLAN TEMP/S" increases to more than 10°C (50°F) within 65 minutes, stop er	ngine because
the test result will be OK. CAUTION:	D
Never overheat engine.	
2. Check 1st trip DTC.	
With GST	Е
Follow the procedure "With CONSULT-III" above.	
Is 1st trip DTC detected?	_
YES >> <u>EC-793, "Diagnosis Procedure"</u> NO >> INSPECTION END	F
Diagnosis Procedure	INFOID:0000000003958727
1. CHECK GROUND CONNECTION	
1. Turn ignition switch OFF.	
2. Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".	11
Is the inspection result normal?	
YES >> GO TO 2. NO >> Repair or replace ground connection.	
2.CHECK ENGINE COOLANT TEMPERATURE SENSOR	
Refer to EC-793, "Component Inspection".	J
Is the inspection result normal?	
YES >> GO TO 3. NO >> Replace engine coolant temperature sensor.	K
3. CHECK THERMOSTAT OPERATION	
	<u> </u>
When the engine is cold [lower than 70°C (158°F)] condition, grasp lower radiator hose and cengine coolant does not flow.	confirm that the
Is the inspection result normal?	
YES >> GO TO 4.	M
NO >> Repair or replace thermostat. Refer to CO-46. "Removal and Installation".	1 V I
4. CHECK INTERMITTENT INCIDENT	
Refer to GI-35, "Intermittent Incident".	N
>> INSPECTION END	
	0
Component Inspection	INFOID:0000000004032222
1. CHECK ENGINE COOLANT TEMPERATURE SENSOR	Р
Turn ignition switch OFF.	
 Disconnect engine coolant temperature sensor harness connector. Remove engine coolant temperature sensor. 	
o. Nome to origino occidiri temperatare sensor.	

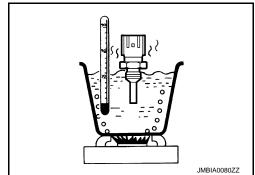
P0125 ECT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

4. Check resistance between engine coolant temperature sensor terminals by heating with hot water as shown in the figure.

Terminals	Condition	Resistance (kΩ)	
	Temperature [°C (°F)]	20 (68)	2.37 - 2.63
1 and 2		50 (122)	0.68 - 1.00
		90 (194)	0.236 - 0.260



Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace engine coolant temperature sensor.

Α

EC

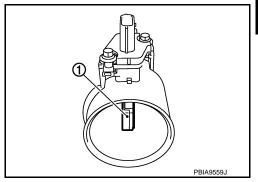
D

P0127 IAT SENSOR

Description INFOID:0000000003958729

The intake air temperature sensor is built-into the mass air flow sensor (1). The sensor detects intake air temperature and transmits a signal to the ECM.

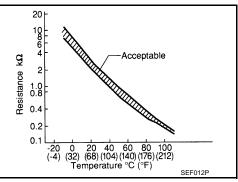
The temperature sensing unit uses a thermistor which is sensitive to the change in temperature. Electrical resistance of the thermistor decreases in response to the rise in temperature.



<Reference data>

Intake air temperature [°C (°F)]	Voltage* (V)	Resistance (kΩ)
25 (77)	3.3	1.800 - 2.200
80 (176)	1.2	0.283 - 0.359

^{*:} These data are reference values and are measured between ECM terminals 48 (Intake air temperature sensor) and 42 (Sensor ground).



DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0127	Intake air temperature too high	Rationally incorrect voltage from the sensor is sent to ECM, compared with the voltage signal from engine coolant temperature sensor.	Harness or connectors (The sensor circuit is open or shorted) Intake air temperature sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

This test may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

>> GO TO 2.

2.perform dtc confirmation procedure

- (P) With CONSULT-III
- Wait until engine coolant temperature is less than 90°C (194°F)
- Turn ignition switch ON.
- Select "DATA MONITOR" mode with CONSULT-III.
- Check the engine coolant temperature.

INFOID:0000000003958730

Ν

Р

EC-795 Revision: 2009 March 2009 FX35/FX50

< DTC/CIRCUIT DIAGNOSIS >

 If the engine coolant temperature is not less than 90°C (194°F), turn ignition switch OFF and cool down engine.

NOTE:

Perform the following steps before engine coolant temperature is above 90°C (194°F).

- 2. Turn ignition switch ON.
- 3. Select "DATA MONITOR" mode with CONSULT-III.
- Start engine.
- 5. Hold vehicle speed at more than 70 km/h (43 MPH) for 100 consecutive seconds.

CAUTION:

Always drive vehicle at a safe speed.

6. Check 1st trip DTC.

With GST

Follow the procedure "With CONSULT-III" above.

Is 1st trip DTC detected?

YES >> Go to EC-796, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003958731

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- 2. Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK INTAKE AIR TEMPERATURE SENSOR

Refer to EC-796, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace mass air flow sensor (bank 1) (with intake air temperature sensor).

3. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000004032223

1. CHECK INTAKE AIR TEMPERATURE SENSOR

- Turn ignition switch OFF.
- Disconnect mass air flow sensor (bank 1) harness connector.
- 3. Check resistance between mass air flow sensor (bank 1) terminals as per the following.

Terminals	Condition	Resistance ($k\Omega$)	
1 and 2	Temperature [°C (°F)]	25 (77)	1.800 - 2.200

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace mass air flow sensor (bank 1) (with intake air temperature sensor).

P0128 THERMOSTAT FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

P0128 THERMOSTAT FUNCTION

DTC Logic INFOID:0000000003958733

DTC DETECTION LOGIC

NOTE:

If DTC P0128 is displayed with DTC P0300, P0301, P0302, P0303, P0304, P0305, P0306, P0307 or P0308, first perform the trouble diagnosis for DTC P0300, P0301, P0302, P0303, P0304, P0305, P0306, P0307, P0308. Refer to EC-858, "DTC Logic".

Engine coolant temperature has not risen enough to open the thermostat even though the engine has run long enough.

This is due to a leakage in the seal or the thermostat being stuck open.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0128	Thermostat function	The engine coolant temperature does not reach to specified temperature even though the engine has run long enough.	ThermostatLeakage from sealing portion of thermostatEngine coolant temperature sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

- For best results, perform at ambient temperature of -10°C (14°F) or higher.
- For best results, perform at engine coolant temperature of -10°C (14°F) to 56°C (133°F).
- Before performing the following procedure, do not add fuel.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- With CONSULT-III
- 1. Turn A/C switch OFF.
- 2. Turn blower fan switch OFF.
- 3. Turn ignition switch ON.
- Select "COOLAN TEMP/S" in "DATA MONITOR" mode with CONSULT-III.
- Check the indication of "COOLAN TEMP/S".
 - If it is below 56°C (133°F), go to next step.
 - If it is above 56°C (133°F), cool engine down to less than 56°C (133°F). Then go to next step.
- 6. Start engine and drive vehicle for 10 consecutive minutes under the following conditions.

More than 56 km/h (35 MPH) Vehicle speed

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

If "COOLAN TEMP/S" increases to more than 75°C (167°F) within 10 minutes, turn ignition switch OFF because the test result will be OK.

Check 1st trip DTC.

With GST

Follow the procedure "With CONSULT-III" above.

Is 1st trip DTC detected?

YES >> Go to EC-798, "Diagnosis Procedure".

NO >> INSPECTION END

Α

EC

D

Е

Н

N

Р

2009 FX35/FX50

P0128 THERMOSTAT FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Diagnosis Procedure

INFOID:0000000003958734

1. CHECK ENGINE COOLANT TEMPERATURE SENSOR

Refer to EC-798, "Component Inspection".

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2. CHECK THERMOSTAT

Refer to CO-46, "Removal and Installation".

Is the inspection result normal?

YES >> INSPECTION END NO >> Replace thermostat.

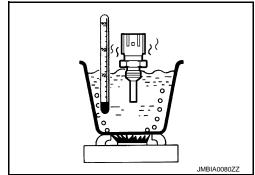
Component Inspection

INFOID:0000000004042449

1. CHECK ENGINE COOLANT TEMPERATURE SENSOR

- 1. Turn ignition switch OFF.
- 2. Disconnect engine coolant temperature sensor harness connector.
- 3. Remove engine coolant temperature sensor.
- 4. Check resistance between engine coolant temperature sensor terminals by heating with hot water as shown in the figure.

Terminals	Condition	Resistance (kΩ)	
1 and 2	Temperature [°C (°F)]	20 (68)	2.37 - 2.63
		50 (122)	0.68 - 1.00
		90 (194)	0.236 - 0.260



Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace engine coolant temperature sensor.

Α

D

Е

K

Ν

Р

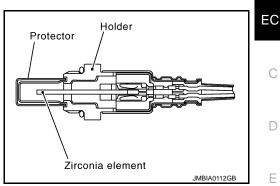
P0130, P0150 A/F SENSOR 1

Description INFOID:0000000003958736

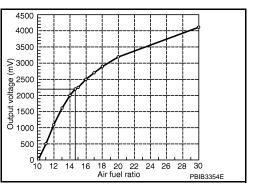
The air fuel ratio (A/F) sensor 1 is a planar one-cell limit current sensor. The sensor element of the A/F sensor 1 is composed an electrode layer, which transports ions. It has a heater in the element.

The sensor is capable of precise measurement $\lambda = 1$, but also in the lean and rich range. Together with its control electronics, the sensor outputs a clear, continuous signal throughout a wide λ range.

The exhaust gas components diffuse through the diffusion layer at the sensor cell. An electrode layer is applied voltage, and this current relative oxygen density in lean. Also this current relative hydrocarbon density in rich.



Therefore, the A/F sensor 1 is able to indicate air fuel ratio by this electrode layer of current. In addition, a heater is integrated in the sensor to ensure the required operating temperature of approximately 800°C (1,472°F).



DTC Logic INFOID:0000000003958737

DTC DETECTION LOGIC

To judge malfunctions, the diagnosis checks that the A/F signal computed by ECM from the A/F sensor 1 signal fluctuates according to fuel feedback control.

DTC No.	Trouble diagnosis name		DTC detecting condition	Possible Cause
P0130 Air fuel ratio (A/F) sensor 1	than approx. 2.2 v.			
	(bank 1) circuit	B)	The A/F signal computed by ECM from the A/F sensor 1 signal is constantly approx. 2.2 V.	Harness or connectors (The A/F sensor 1 circuit is open
P0150 Air fuel ratio (A/F) sensor 1	A)	The A/F signal computed by ECM from the A/F sensor 1 signal is constantly in a range other than approx. 2.2 V.	or shorted.) • A/F sensor 1	
(bank 2) circuit		B)	The A/F signal computed by ECM from the A/F sensor 1 signal is constantly approx. 2.2 V.	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 11 V at idle.

>> GO TO 2.

< DTC/CIRCUIT DIAGNOSIS >

2.perform dtc confirmation procedure for malfunction a

- Start engine and warm it up to normal operating temperature.
- Let engine idle for 2 minutes.
- Check 1st trip DTC.

Is 1st trip DTC detected?

>> Go to EC-801, "Diagnosis Procedure".

NO-1 >> With CONSULT-III: GO TO 3.

NO-2 >> With GST: GO TO 7.

3.CHECK AIR FUEL RATIO (A/F) SENSOR 1 FUNCTION

(P) With CONSULT-III

- Start engine and warm it up to normal operating temperature.
- Select "A/F SEN1 (B1)" or "A/F SEN1 (B2)" in "DATA MONITOR" mode with CONSULT-III.
- Check "A/F SEN1 (B1)" or "A/F SEN1 (B2)" indication.

Does the indication fluctuate around 2.2 V?

YES >> GO TO 4.

NO >> Go to EC-801, "Diagnosis Procedure".

$oldsymbol{4}.$ PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION B-I

- Select "A/F SEN1 (B1) P1276" (for DTC P0130) or "A/F SEN1 (B2) P1286" (for DTC P0150) of "A/F SEN1" in "DTC WORK SUPPORT" mode with CONSULT-III.
- Touch "START".
- When the following conditions are met, "TESTING" will be displayed on the CONSULT-III screen.

ENG SPEED	1,750 - 3,200 rpm
VHCL SPEED SE	More than 64 km/h (40 mph)
B/FUEL SCHDL	1.0 - 8.0 msec
Selector lever	D position

If "TESTING" is not displayed after 20 seconds, retry from step 2.

Always drive vehicle at a safe speed.

Is "TESTING" displayed on CONSULT-III screen?

YES >> GO TO 5.

NO >> Check A/F sensor 1 function again. GO TO 3.

${f 5.}$ PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION B-II

Release accelerator pedal fully.

NOTE:

Never apply brake when releasing the accelerator pedal.

Which does "TESTING" change to?

COMPLETED>>GO TO 6.

OUT OF CONDITION>>Retry DTC CONFIRMATION PROCEDURE. GO TO 4.

O.PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION B-III

Touch "SELF-DIAG RESULT".

Which is displayed on CONSULT-III screen?

YES >> INSPECTION END

NO >> Go to EC-801, "Diagnosis Procedure".

7 PERFORM COMPONENT FUNCTION CHECK FOR MALFUNCTION B

With GST

Perform component function check. Refer to EC-801, "Component Function Check".

NOTE:

Use component function check to check the overall function of the A/F sensor 1 circuit. During this check, a 1st trip DTC might not be confirmed.

P0130, P0150 A/F SENSOR 1

[VK50VE] < DTC/CIRCUIT DIAGNOSIS > Is the inspection result normal? YES >> INSPECTION END

Component Function Check

INFOID:0000000003958738

Α

EC

D

Е

1. PERFORM COMPONENT FUNCTION CHECK

>> Go to EC-801, "Diagnosis Procedure".

With GST 1. Start engine and warm it up to normal operating temperature.

Drive the vehicle at a speed of 80 km/h (50 MPH) for a few minutes in the suitable gear position.

Shift the selector lever position to D, then release the accelerator pedal fully until the vehicle speed decreases to 50 km/h (31 MPH).

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

NO

Never apply brake when releasing the accelerator pedal.

- Repeat steps 2 and 3 for 5 times.
- Stop the vehicle and turn ignition switch OFF.
- 6. Wait at least 10 seconds and turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.
- Restart engine.
- 9. Repeat steps 2 and 3 for 5 times.
- 10. Stop the vehicle.
- 11. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-801, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003958739

1. CHECK GROUND CONNECTION

- Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK AIR FUEL RATIO SENSOR 1 POWER SUPPLY CIRCUIT

- Disconnect air fuel ratio (A/F) sensor 1 harness connector.
- Turn ignition switch ON. 2.
- Check the voltage between A/F sensor 1 harness connector and ground.

DTC		A/F sensor	Ground	Voltage	
DIC	Bank	ank Connector Terminal		Glound	voltage
P0130	1	F67	4	Ground	Battery voltage
P0150	2	F68	4	Glound	Battery Voltage

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E10, F10
- IPDM E/R harness connector E7
- 15 A fuse (No. 46)
- Harness for open or short between A/F sensor 1 and fuse

EC-801 Revision: 2009 March 2009 FX35/FX50

K

N

>> Repair or replace harness or connectors.

4. CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check the continuity between A/F sensor 1 harness connector and ECM harness connector.

DTC	A/F sensor 1			EC	Continuity		
DIC	Bank	Connector	Terminal	Connector Terminal		Continuity	
D0130	0130 1	1 F67			81		
F0130		Γ01	2	F111	82	Existed	
P0150	2	F68	1	1 111	85	LXISIGU	
F0150	150 2 F68	2		86			

4. Check the continuity between A/F sensor 1 harness connector and ground, or ECM harness connector and ground.

DTC	A/F sensor 1		1	ECM		Ground	Continuity
Bai		Connector	Terminal	Connector	Terminal	Ground	Continuity
P0130	1	F67	1		81		
F0130			2	F111	82	Ground	Not existed
P0150	2		1	1 111	85	Ground	NOI EXISIEU
F0150	2 F08	2		86			

5. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

5. CHECK INTERMITTENT INCIDENT

Perform GI-35, "Intermittent Incident".

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace malfunctioning part.

O.REPLACE A/F SENSOR 1

Replace malfunctioning A/F sensor 1.

CAUTION:

- Discard any A/F sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new A/F sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J-43897-12)] and approved anti-seize lubricant (commercial service tool).

>> INSPECTION END

Α

EC

D

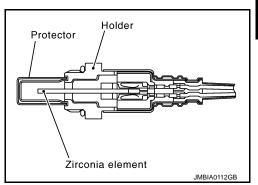
P0131, P0151 A/F SENSOR 1

Description INFOID:0000000004032227

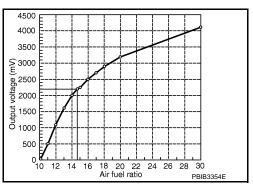
The air fuel ratio (A/F) sensor 1 is a planar one-cell limit current sensor. The sensor element of the A/F sensor 1 is composed an electrode layer, which transports ions. It has a heater in the element.

The sensor is capable of precise measurement $\lambda = 1$, but also in the lean and rich range. Together with its control electronics, the sensor outputs a clear, continuous signal throughout a wide λ range.

The exhaust gas components diffuse through the diffusion layer at the sensor cell. An electrode layer is applied voltage, and this current relative oxygen density in lean. Also this current relative hydrocarbon density in rich.



Therefore, the A/F sensor 1 is able to indicate air fuel ratio by this electrode layer of current. In addition, a heater is integrated in the sensor to ensure the required operating temperature of approximately 800°C (1,472°F).



DTC Logic INFOID:0000000003958741

DTC DETECTION LOGIC

To judge the malfunction, the diagnosis checks that the A/F signal computed by ECM from the A/F sensor 1 signal is not inordinately low.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible Cause
P0131	Air fuel ratio (A/F) sensor 1 (bank 1) circuit low voltage	The A/F signal computed by ECM from the A/F	Harness or connectors (The A/F sensor 1 circuit is open or
P0151	Air fuel ratio (A/F) sensor 1 (bank 2) circuit low voltage	sensor 1 signal is constantly approx. 0 V.	shorted.) • A/F sensor 1

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10.5 V at idle.

EC-803

>> GO TO 2.

2.CHECK A/F SENSOR FUNCTION

With CONSULT-III

Revision: 2009 March

- Start engine and warm it up to normal operating temperature.
- Select "A/F SEN1 (B1)" or "A/F SEN1 (B2)" in "DATA MONITOR" mode with CONSULT-III.
- Check "A/F SEN1 (B1)" or "A/F SEN1 (B2)" indication.

2009 FX35/FX50

K

M

Ν

INFOID:0000000003958742

< DTC/CIRCUIT DIAGNOSIS >

With GST

Follow the procedure "With CONSULT-III" above.

Is the indication constantly approx. 0 V?

YES >> Go to EC-804, "Diagnosis Procedure".

NO >> GO TO 3.

3. PERFORM DTC CONFIRMATION PROCEDURE

(P) With CONSULT-III

- Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.
- 4. Restart engine.
- 5. Drive and accelerate vehicle to more than 40 km/h (25 MPH) within 20 seconds after restarting engine. CAUTION:

Always drive vehicle at a safe speed.

6. Maintain the following conditions for approximately 20 consecutive seconds.

ENG SPEED	1,000 - 3,200 rpm
VHCL SPEED SE	More than 40 km/h (25 mph)
B/FUEL SCHDL	1.5 - 9.0 msec
Selector lever	Suitable position

NOTE:

- Keep the accelerator pedal as steady as possible during cruising.
- If this procedure is not completed within 1 minute after restarting engine at step 1, return to step
- 7. Check 1st trip DTC.
- With GST

Follow the procedure "With CONSULT-III" above.

Is 1st trip DTC detected?

YES >> Go to EC-804, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- 2. Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2. CHECK AIR FUEL RATIO SENSOR 1 POWER SUPPLY CIRCUIT

- 1. Disconnect air fuel ratio (A/F) sensor 1 harness connector.
- Turn ignition switch ON.
- 3. Check the voltage between A/F sensor 1 harness connector and ground.

DTC	A/F sensor 1			Ground	Voltage	
DIC	Bank	Connector	Terminal	Giodila	voltage	
P0131	1	F67	4	Ground	Battery voltage	
P0151	2	F68	4	Glound	ballery vollage	

Is the inspection result normal?

YES >> GO TO 4. NO >> GO TO 3.

3. DETECT MALFUNCTIONING PART

P0131, P0151 A/F SENSOR 1

< DTC/CIRCUIT DIAGNOSIS > [VK50VE]

Check the following.

- Harness connectors E10, F10
- IPDM E/R harness connector E7
- 15 A fuse (No. 46)
- Harness for open or short between A/F sensor 1 and fuse

EC

D

Е

Α

>> Repair or replace harness or connectors.

4. CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check the continuity between A/F sensor 1 harness connector and ECM harness connector.

DTC	A/F sensor 1			EC	Continuity		
DIC	Bank	Connector	Terminal	Connector	Connector Terminal		
P0131	1	F67	1		81		
P0131		F07	2	F111	82	Existed	
P0151	2	2 F68	1	1 111	85		
PU151	2		2		86		

 Check the continuity between A/F sensor 1 harness connector and ground, or ECM harness connector and ground.

DTC	A/F sensor 1			ECM		Ground	Continuity
DIC	Bank	Connector	Terminal	Connector	Terminal	Giodila	Continuity
P0131	1	1 F67	1	F111	81	Ground	Not existed
F0131			2		82		
P0151	2	F68	1		85		
P0151			2		86		

5. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

5. CHECK INTERMITTENT INCIDENT

Perform GI-35, "Intermittent Incident".

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace malfunctioning part.

O.REPLACE A/F SENSOR 1

Replace malfunctioning A/F sensor 1.

CAUTION:

- Discard any A/F sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new A/F sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J-43897-12)] and approved anti-seize lubricant (commercial service tool).

>> INSPECTION END

G

F

Н

IZ

K

M

Ν

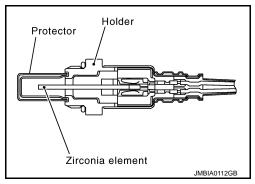
P0132, P0152 A/F SENSOR 1

Description INFOID:00000000403222E

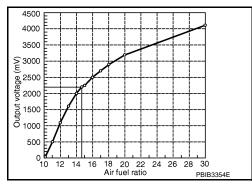
The air fuel ratio (A/F) sensor 1 is a planar one-cell limit current sensor. The sensor element of the A/F sensor 1 is composed an electrode layer, which transports ions. It has a heater in the element.

The sensor is capable of precise measurement $\lambda = 1$, but also in the lean and rich range. Together with its control electronics, the sensor outputs a clear, continuous signal throughout a wide λ range.

The exhaust gas components diffuse through the diffusion layer at the sensor cell. An electrode layer is applied voltage, and this current relative oxygen density in lean. Also this current relative hydrocarbon density in rich.



Therefore, the A/F sensor 1 is able to indicate air fuel ratio by this electrode layer of current. In addition, a heater is integrated in the sensor to ensure the required operating temperature of approximately 800°C (1,472°F).



DTC Logic

DTC DETECTION LOGIC

To judge the malfunction, the diagnosis checks that the A/F signal computed by ECM from the A/F sensor 1 signal is not inordinately high.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible Cause
P0132	Air fuel ratio (A/F) sensor 1 (bank 1) circuit high voltage	The A/F signal computed by ECM from the	Harness or connectors (The A/F sensor 1 circuit is open or
P0152	Air fuel ratio (A/F) sensor 1 (bank 2) circuit high voltage	A/F sensor 1 signal is constantly approx. 5 V.	shorted.) • A/F sensor 1

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10.5 V at idle.

>> GO TO 2.

2.CHECK A/F SENSOR FUNCTION

(I) With CONSULT-III

- Start engine and warm it up to normal operating temperature.
- 2. Select "A/F SEN1 (B1)" or "A/F SEN1 (B2)" in "DATA MONITOR" mode with CONSULT-III.
- Check "A/F SEN1 (B1)" or "A/F SEN1 (B2)" indication.

P0132, P0152 A/F SENSOR 1

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

With GST

Follow the procedure "With CONSULT-III" above.

Is the indication constantly approx. 5 V?

>> Go to EC-807, "Diagnosis Procedure". YES

NO >> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

(P) With CONSULT-III

- Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.
- Restart engine.
- 5. Drive and accelerate vehicle to more than 40 km/h (25 MPH) within 20 seconds after restarting engine. **CAUTION:**

Always drive vehicle at a safe speed.

6. Maintain the following conditions for approximately 20 consecutive seconds.

ENG SPEED	1,000 - 3,200 rpm
VHCL SPEED SE	More than 40 km/h (25 mph)
B/FUEL SCHDL	1.5 - 9.0 msec
Selector lever	Suitable position

NOTE:

- Keep the accelerator pedal as steady as possible during cruising.
- If this procedure is not completed within 1 minute after restarting engine at step 1, return to step
- 7. Check 1st trip DTC.
- With GST

Follow the procedure "With CONSULT-III" above.

Is 1st trip DTC detected?

YES >> Go to EC-807, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1. CHECK GROUND CONNECTION

- Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK AIR FUEL RATIO SENSOR 1 POWER SUPPLY CIRCUIT

- 1. Disconnect air fuel ratio (A/F) sensor 1 harness connector.
- Turn ignition switch ON.
- Check the voltage between A/F sensor 1 harness connector and ground.

DTC		A/F senso	Ground	Voltage		
DIC	Bank	Connector	Terminal	Glound	voitage	
P0132	1	F67	4	Ground	Battery voltage	
P0152	2	F68	4	Giodila	Ballery Vollage	

Is the inspection result normal?

>> GO TO 3.

YES >> GO TO 4.

NO

3.DETECT MALFUNCTIONING PART

EC-807 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

F

INFOID:0000000003958745

Р

< DTC/CIRCUIT DIAGNOSIS >

Check the following.

- Harness connectors E10, F10
- IPDM E/R harness connector E7
- 15 A fuse (No. 46)
- Harness for open or short between A/F sensor 1 and fuse

>> Repair or replace harness or connectors.

4. CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check the continuity between A/F sensor 1 harness connector and ECM harness connector.

DTC	A/F sensor 1			EC	Continuity		
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity	
P0132	1 F67		1		81		
F0132	'	1 07	2	F111	82	Existed	
P0152	2	F68	1	1 111	85		
F 0 132	2		2		86		

Check the continuity between A/F sensor 1 harness connector and ground, or ECM harness connector and ground.

DTC	A/F sensor 1			ECM		Ground	Continuity
DIC	Bank	Connector	Terminal	Connector	Terminal	Ground	Continuity
P0132	1	1 F67	1	F111	81	Ground	Not existed
F0132			2		82		
P0152	2	F68	1		85		
PU152			2		86		

5. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

CHECK INTERMITTENT INCIDENT

Perform GI-35, "Intermittent Incident".

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace malfunctioning part.

6.REPLACE A/F SENSOR 1

Replace malfunctioning A/F sensor 1.

CAUTION:

- Discard any A/F sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new A/F sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J-43897-12)] and approved anti-seize lubricant (commercial service tool).

>> INSPECTION END

Α

D

Н

N

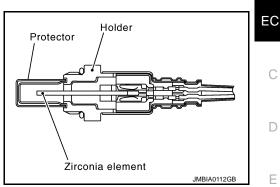
P0133, P0153 A/F SENSOR 1

Description INFOID:0000000004032229

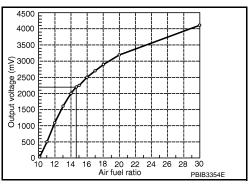
The air fuel ratio (A/F) sensor 1 is a planar one-cell limit current sensor. The sensor element of the A/F sensor 1 is composed an electrode layer, which transports ions. It has a heater in the element.

The sensor is capable of precise measurement $\lambda = 1$, but also in the lean and rich range. Together with its control electronics, the sensor outputs a clear, continuous signal throughout a wide λ range.

The exhaust gas components diffuse through the diffusion layer at the sensor cell. An electrode layer is applied voltage, and this current relative oxygen density in lean. Also this current relative hydrocarbon density in rich.



Therefore, the A/F sensor 1 is able to indicate air fuel ratio by this electrode layer of current. In addition, a heater is integrated in the sensor to ensure the required operating temperature of approximately 800°C (1,472°F).



DTC Logic INFOID:0000000003958747

DTC DETECTION LOGIC

To judge the malfunction of A/F sensor 1, this diagnosis measures response time of the A/F signal computed by ECM from the A/F sensor 1 signal. The time is compensated by engine operating (speed and load), fuel feedback control constant, and the A/F sensor 1 temperature index. Judgment is based on whether the compensated time (the A/F signal cycling time index) is inordinately long or not.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible Cause
P0133	Air fuel ratio (A/F) sensor 1 (bank 1) circuit slow response	· ·	
P0153	Air fuel ratio (A/F) sensor 1 (bank 2) circuit slow response	The response of the A/F signal computed by ECM from A/F sensor 1 signal takes more than the specified time.	shorted.) • A/F sensor 1 • A/F sensor 1 heater • Fuel pressure • Fuel injector • Intake air leaks • Exhaust gas leaks • PCV • Mass air flow sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 11 V at idle.

Will CONSULT-III be used?

EC-809 Revision: 2009 March 2009 FX35/FX50

P0133, P0153 A/F SENSOR 1

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

YES >> GO TO 2. NO >> GO TO 5.

2.PERFORM DTC CONFIRMATION PROCEDURE-I

(II) With CONSULT-III

- Start engine and warm it up to normal operating temperature.
- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- 4. Turn ignition switch OFF and wait at least 10 seconds.
- Restart engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- 6. Let engine idle for 1 minute.
- 7. Select "A/F SEN1(B1) P1278/P1279" (for DTC P0133) or "A/F SEN1(B2) P1288/P1289" (for DTC P0153) of "A/F SEN1" in "DTC WORK SUPPORT" mode with CONSULT-III.
- 8. Touch "START".

Is "COMPLETED" displayed on CONSULT-III screen?

YES >> GO TO 3 NO >> GO TO 4.

3.perform dtc confirmation procedure-ii

Touch "SELF-DIAG RESULT".

Which is displayed on CONSULT-III screen?

OK >> INSPECTION END

NG >> Go to EC-811, "Diagnosis Procedure".

4. PERFORM DTC CONFIRMATION PROCEDURE-II

- 1. After perform the following procedure, "TESTING" will be displayed on the CONSULT-III screen.
- Increase the engine speed up to between 4,000 and 5,000 rpm and maintain that speed for 10 seconds.
- Fully release accelerator pedal and then let engine idle for approximately 10 seconds.

If "TESTING" is not displayed after 10 seconds, refer to EC-731, "Component Function Check".

- Wait for approximately 20 seconds at idle under the condition that "TESTING" is displayed on the CON-SULT-III screen.
- Check that "TESTING" changes to "COMPLETED".
 - If "TESTING" changed to "OUT OF CONDITION", refer to EC-731, "Component Function Check".
- Touch "SELF-DIAG RESULT".

Which is displayed on CONSULT-III screen?

OK >> INSPECTION END

NG >> Go to EC-811, "Diagnosis Procedure".

5. CHECK AIR-FUEL RATIO SELF-LEARNING VALUE

With GST

- 1. Start engine and warm it up to normal operating temperature.
- Select Service \$01 with GST.
- Calculate the total value of "Short term fuel trim" and "Long term fuel trim" indications.

Is the total percentage within ±15%?

YES >> GO TO 7. NO >> GO TO 6.

6.DETECT MALFUNCTIONING PART

Check the following.

- Intake air leaks
- Exhaust gas leaks
- Incorrect fuel pressure
- Lack of fuel
- Fuel injector
- Incorrect PCV hose connection
- PCV valve
- · Mass air flow sensor

P0133, P0153 A/F SENSOR 1

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

>> Repair or replace malfunctioning part.

7.PERFORM DTC CONFIRMATION PROCEDURE

- Turn ignition switch OFF and wait at least 10 seconds.
- Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load. 2.
- Let engine idle for 1 minute. 3.
- Increase the engine speed up to between 4,000 and 5,000 rpm and maintain that speed for 10 seconds.
- Fully release accelerator pedal and then let engine idle for approximately 1 minute.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-811, "Diagnosis Procedure".

>> INSPECTION END NO

Diagnosis Procedure

INFOID:0000000003958748

1. CHECK GROUND CONNECTION

- Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

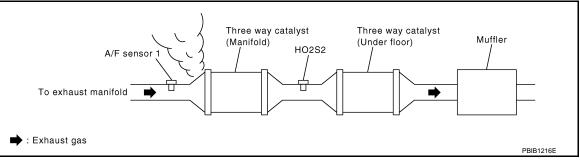
2.RETIGHTEN AIR FUEL RATIO SENSOR 1 $\,$

Loosen and retighten the air fuel ratio (A/F) sensor 1. Refer to EM-205, "Disassembly and Assembly".

>> GO TO 3.

3. CHECK EXHAUST GAS LEAKAGE

- 1. Start engine and run it at idle.
- Listen for an exhaust gas leakage before three way catalyst (manifold).



Is exhaust gas leakage detected?

YES >> Repair or replace malfunctioning part.

NO >> GO TO 4.

f 4.CHECK FOR INTAKE AIR LEAKAGE

Listen for an intake air leakage after the mass air flow sensor.

Is intake air leakage detected?

>> Repair or replace malfunctioning part. YES

NO >> GO TO 5.

f 5.CLEAR THE MIXTURE RATIO SELF-LEARNING VALUE

- Clear the mixture ratio self-learning value. Refer to EC-586, "MIXTURE RATIO SELF-LEARNING VALUE CLEAR: Special Repair Requirement".
- Run engine for at least 10 minutes at idle speed.

Is the 1st trip DTC P0171, P172, P0174 or P0175 detected? Is it difficult to start engine?

YES >> Perform trouble diagnosis for DTC P0171, P0174 or P0172, P0175. Refer to EC-834, "DTC Logic" or EC-838, "DTC Logic".

NO >> GO TO 6.

Revision: 2009 March

EC-811

Α

EC

D

Н

N

2009 FX35/FX50

< DTC/CIRCUIT DIAGNOSIS >

6. CHECK A/F SENSOR 1 POWER SUPPLY CIRCUIT

- 1. Disconnect A/F sensor 1 harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between A/F sensor 1 harness connector and ground.

DTC		A/F sensor	r 1	Ground	Voltage	
ыс	Bank	Connector	Terminal	Giodila	voltage	
P0133	1	F67	4	Ground	Battery voltage	
P0153	2	F68	4	Ground	Dattery Voltage	

Is the inspection result normal?

YES >> GO TO 8.

NO >> GO TO 7.

7.DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E10, F10
- IPDM E/R harness connector E7
- 15 A fuse (No. 46)
- Harness for open or short between A/F sensor 1 and fuse

>> Repair or replace harness or connectors.

$8.\mathsf{CHECK}$ A/F SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check the continuity between A/F sensor 1 harness connector and ECM harness connector.

DTC	A/F sensor 1			EC	Continuity		
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity	
P0133	133 1	F67	1		81		
F0133			2	F111	82	Existed	
P0153	0153 2	F68	1	1 111	85	LXISIEU	
F0155		F00	2		86		

4. Check the continuity between A/F sensor 1 harness connector and ground, or ECM harness connector and ground.

DTC	A/F sensor 1			ECM		Ground	Continuity
DIC	Bank	Bank Connector Term		Connector	Terminal	Giodila	Continuity
P0133	D0122 1	1 F67	1		81		Not existed
F0133	'		2	F111	82	Ground	
P0153	D0450 0	F68	1	1 111	85		
PU103	2	F00	2		86		

5. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

9. CHECK A/F SENSOR 1 HEATER

Refer to EC-758, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 10.

P0133, P0153 A/F SENSOR 1	
< DTC/CIRCUIT DIAGNOSIS > [VK50VE]	
NO >> GO TO 13.	
10.check mass air flow sensor	Α
Check both mass air flow sensor (bank 1) and mass air flow sensor (bank 2). Refer to EC-772, "Component Inspection".	EC
Is the inspection result normal?	EC
YES >> GO TO 11. NO >> Replace malfunctioning mass air flow sensor.	С
11. CHECK PCV VALVE	
Refer to EC-1120, "Component Inspection".	
Is the inspection result normal?	D
YES >> GO TO 12.	
NO >> Repair or replace PCV valve.	Е
12.check intermittent incident	
Perform GI-35, "Intermittent Incident".	
Is the inspection result normal?	F
YES >> GO TO 13.	
NO >> Repair or replace malfunctioning part. 13.REPLACE A/F SENSOR 1	0
	G
 Replace malfunctioning A/F sensor 1. CAUTION: Discard any A/F sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one. 	Н
 Before installing new A/F sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J-43897-12)] and approved anti-seize lubricant (commercial service tool). 	I
>> INSPECTION END	J
22 INC. LOTTER LINE	J
	K
	L
	M
	Ν
	0
	Р

EC-813 Revision: 2009 March 2009 FX35/FX50

INFOID:0000000003958750

P0137, P0157 HO2S2

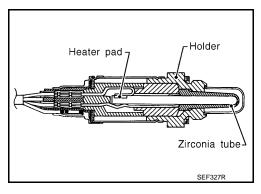
Description INFOID:000000003958749

The heated oxygen sensor 2, after three way catalyst (manifold), monitors the oxygen level in the exhaust gas on each bank.

Even if switching characteristics of the air fuel ratio (A/F) sensor 1 are shifted, the air fuel ratio is controlled to stoichiometric, by the signal from the heated oxygen sensor 2.

This sensor is made of ceramic zirconia. The zirconia generates voltage from approximately 1 V in richer conditions to 0 V in leaner conditions.

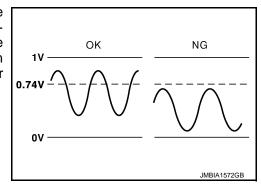
Under normal conditions the heated oxygen sensor 2 is not used for engine control operation.



DTC Logic

DTC DETECTION LOGIC

The heated oxygen sensor 2 has a much longer switching time between rich and lean than the air fuel ratio (A/F) sensor 1. The oxygen storage capacity of the three way catalyst (manifold) causes the longer switching time. To judge the malfunctions of heated oxygen sensor 2, ECM monitors whether the maximum voltage of the sensor is sufficiently high during various driving conditions such as fuel cut.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0137	Heated oxygen sensor 2 (bank 1) circuit low voltage	The constitution of the co	Harness or connectors (The sensor circuit is open or shorted)
P0157	Heated oxygen sensor 2 (bank 2) circuit low voltage	The maximum voltage from the sensor does not reach the specified voltage.	 Heated oxygen sensor 2 Fuel pressure Fuel injector Intake air leaks

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

Will CONSULT-III be used?

YES >> GO TO 2. NO >> GO TO 4.

2. PERFORM DTC CONFIRMATION PROCEDURE

(P) With CONSULT-III

TESTING CONDITION:

For better results, perform "DTC WORK SUPPORT" at a temperature of 0 to 30°C (32 to 86°F).

- 1. Start engine and warm it up to the normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Turn ignition switch ON.

< DTC/CIRCUIT DIAGNOSIS >

- Turn ignition switch OFF and wait at least 10 seconds.
- Restart engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no 5.
- Let engine idle for 1 minute.
- Select "DATA MONITOR" mode with CONSULT-III.
- 8. Check that "COOLAN TEMP/S" indicates more than 70°C (158°F). If not, warm up engine and go to next step when "COOLAN TEMP/S" indication reaches 70°C (158°F).
- Open engine hood.
- 10. Select "HO2S2 (B1) P1147" (for DTC P0137) or "HO2S2 (B2) P1167" (for DTC P0157) of "HO2S2" in "DTC WORK SUPPORT" mode with CONSULT-III.
- 11. Follow the instruction of CONSULT-III display.

NOTE:

It will take at most 10 minutes until "COMPLETED" is displayed.

12. Touch "SELF-DIAG RESULTS".

Which is displayed on CONSULT-III screen?

OK >> INSPECTION END

NG >> Go to EC-816, "Diagnosis Procedure".

CAN NOT BE DIAGNOSED>>GO TO 3.

3.perform dtc confirmation procedure again

- Turn ignition switch OFF and leave the vehicle in a cool place (soak the vehicle).
- Perform DTC confirmation procedure again.

>> GO TO 2.

4. PERFORM COMPONENT FUNCTION CHECK

Perform component function check. Refer to EC-815, "Component Function Check".

NOTE:

Use component function check to check the overall function of the heated oxygen sensor 2 circuit. During this check, a 1st trip DTC might not be confirmed.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-816, "Diagnosis Procedure".

Component Function Check

1.PERFORM COMPONENT FUNCTION CHECK-I

With GST

- 1. Start engine and warm it up to the normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.
- 5. Restart engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- Let engine idle for 1 minute.
- Check the voltage between ECM harness connector terminals under the following conditions.

	ECM					
DTC	Connector	+	_	Condition	Voltage	
	Connector	Terminal	Terminal			
P0137	F110	32	31	Revving up to 4,000 rpm under no load at	The voltage should be above 0.74 V at	
P0157	57	36	31	least 10 times	least once during this procedure.	

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

EC-815 Revision: 2009 March 2009 FX35/FX50

EC

[VK50VE]

D

Е

Н

INFOID:0000000003958751

M

Ν

Р

< DTC/CIRCUIT DIAGNOSIS >

2.PERFORM COMPONENT FUNCTION CHECK-II

Check the voltage between ECM harness connector terminals under the following conditions.

	ECM + -					
DTC			_	Condition	Voltage	
Connector	Terminal	Terminal				
P0137	F110	32	31	Keeping engine at idle for 10 minutes	The voltage should be above 0.74 V at	
P0157	1 110	36	31	Reeping engine at lule for 10 minutes	least once during this procedure.	

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 3.

3. PERFORM COMPONENT FUNCTION CHECK-III

Check the voltage between ECM harness connector terminals under the following conditions.

	ECM					
DTC	Connector	+	_	Condition	Voltage	
	Connector	Terminal	Terminal			
P0137	F110	32	Coasting from 80 km/h (50 MPH) with se-		The voltage should be above 0.74 V at	
P0157	1 110	36	31	lector lever in the D position	least once during this procedure.	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-816, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003958752

1. CHECK GROUND CONNECTION

- Turn ignition switch OFF.
- 2. Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CLEAR THE MIXTURE RATIO SELF-LEARNING VALUE

- Clear the mixture ratio self-learning value. Refer to <u>EC-586, "MIXTURE RATIO SELF-LEARNING VALUE CLEAR: Special Repair Requirement"</u>.
- Run engine for at least 10 minutes at idle speed.

Is the 1st trip DTC P0171 or P0174 detected? Is it difficult to start engine?

YES >> Perform trouble diagnosis for DTC P0171 or P0174. Refer to EC-834, "DTC Logic".

NO >> GO TO 3.

3.check heated oxygen sensor 2 ground circuit for open and short

- 1. Turn ignition switch OFF.
- Disconnect heated oxygen sensor 2 (HO2S2) harness connector.
- Disconnect ECM harness connector.
- 4. Check the continuity between HO2S2 harness connector and ECM harness connector.

DTC		HO2S2		EC	Continuity	
	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0137	1	F87	1	F110	31	Existed
P0157	2	F88	1	1110	5	LXISIEU

5. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

f 4.CHECK HO2S2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

Check the continuity between HO2S2 harness connector and ECM harness connector.

DTC	HO2S2			EC	Continuity	
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0137	1	F87	4	F110	32	Existed
P0157	2	F88	4	1 110	36	LAISIEU

Check the continuity between HO2S2 harness connector and ground, or ECM harness connector and ground.

DTC	HO2S2			ECM			Continuity
БТО	Bank	Connector	Terminal	Connector	Terminal	Ground	Continuity
P0137	1	F87	4	F110	32	Ground	Not existed
P0157	2	F88	4	1110	36	Giodila	Not existed

3. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

5. CHECK HEATED OXYGEN SENSOR 2

Refer to EC-817, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6.

6.REPLACE HEATED OXYGEN SENSOR 2

Replace malfunctioning heated oxygen sensor 2.

CAUTION:

- Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J-43897-12)] and approved anti-seize lubricant (commercial service tool).

>> INSPECTION END

7. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

1.INSPECTION START

Will CONSULT-III be used?

Will CONSULT-III be used?

YES >> GO TO 2.

NO >> GO TO 3.

2.CHECK HEATED OXYGEN SENSOR 2

EC-817

EC

Α

D

Е

F

K

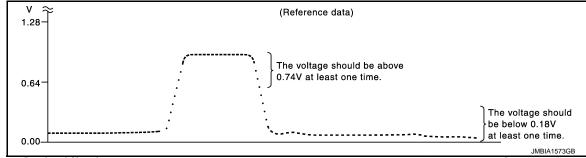
M

INFOID:0000000003958753

Р

(II) With CONSULT-III

- Start engine and warm it up to the normal operating temperature.
- 2. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- Let engine idle for 1 minute.
- 4. Select "FUEL INJECTION" in "ACTIVE TEST" mode, and select "HO2S2 (B1)/(B2)" as the monitor item with CONSULT-III.
- 5. Check "HO2S2 (B1)/(B2)" at idle speed when adjusting "FUEL INJECTION" to ±25%.



"HO2S2 (B1)/(B2)" should be above 0.74 V at least once when the "FUEL INJECTION" is +25%. "HO2S2 (B1)/(B2)" should be below 0.18 V at least once when the "FUEL INJECTION" is -25%.

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 6.

3.CHECK HEATED OXYGEN SENSOR 2-I

Without CONSULT-III

- 1. Start engine and warm it up to the normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- Let engine idle for 1 minute.
- Check the voltage between ECM harness connector terminals under the following conditions.

ECM					
Connector -	+ -		Condition	Voltage	
	Terminal	Terminal			
F110 -	32 [HO2S2 (bank 1)]	- 31	Revving up to 4,000 rpm under no load at least 10 times	The voltage should be above 0.74 V at least once during this procedure.	
	36 [HO2S2 (bank 2)]			The voltage should be below 0.18 V at least once during this procedure.	

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 4.

4. CHECK HEATED OXYGEN SENSOR 2-II

Check the voltage between ECM harness connector terminals under the following conditions.

ECM					
Connector	+ -		Condition	Voltage	
Connector	Terminal	Terminal			
E110	32 [HO2S2 (bank 1)]	- 31	Kooning angine at idle for 10 minutes	The voltage should be above 0.74 V at least once during this procedure.	
F110 -	36 [HO2S2 (bank 2)]		Keeping engine at idle for 10 minutes	The voltage should be below 0.18 V at least once during this procedure.	

P0137, P0157 HO2S2

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 5.

5. CHECK HEATED OXYGEN SENSOR 2-III

Check the voltage between ECM harness connector terminals under the following conditions.

	ECM			Voltage	
Connector	+ –		Condition		
Connector	Terminal	Terminal			
F110 -	32 [HO2S2 (bank 1)]	31	Coasting from 80 km/h (50 MPH) with se-	The voltage should be above 0.74 V at least once during this procedure.	
1110	36 [HO2S2 (bank 2)]	31	lector lever in the D position	The voltage should be below 0.18 V at least once during this procedure.	

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 6.

6. REPLACE HEATED OXYGEN SENSOR 2

Replace malfunctioning heated oxygen sensor 2.

CAUTION:

- Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J-43897-12)] and approved anti-seize lubricant (commercial service tool).

>> INSPECTION END

EC

Α

D

Е

F

G

K

L

Ν

U

Р

P0138, P0158 HO2S2

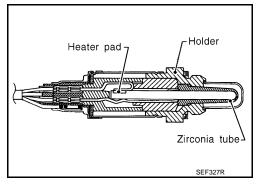
Description INFOID:0000000003958754

The heated oxygen sensor 2, after three way catalyst (manifold), monitors the oxygen level in the exhaust gas on each bank.

Even if switching characteristics of the air fuel ratio (A/F) sensor 1 are shifted, the air fuel ratio is controlled to stoichiometric, by the signal from the heated oxygen sensor 2.

This sensor is made of ceramic zirconia. The zirconia generates voltage from approximately 1 V in richer conditions to 0 V in leaner conditions.

Under normal conditions the heated oxygen sensor 2 is not used for engine control operation.



DTC Logic

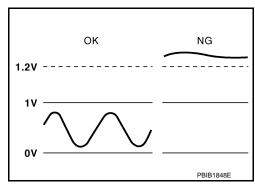
INFOID:0000000003958755

DTC DETECTION LOGIC

The heated oxygen sensor 2 has a much longer switching time between rich and lean than the air fuel ratio (A/ F) sensor 1. The oxygen storage capacity of the three way catalyst (manifold) causes the longer switching time.

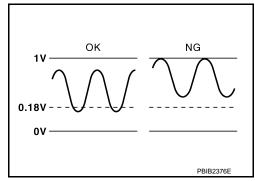
MALFUNCTION A

To judge the malfunctions of heated oxygen sensor 2, ECM monitors whether the voltage is unusually high during various driving conditions such as fuel cut.



MALFUNCTION B

To judge the malfunctions of heated oxygen sensor 2, ECM monitors whether the minimum voltage of sensor is sufficiently low during various driving conditions such as fuel cut.



DTC No.	Trouble diagnosis name	DTC detecting condition		Possible cause
		A)	An excessively high voltage from the sensor is sent to ECM.	Harness or connectors (The sensor circuit is open or shorted) Heated oxygen sensor 2
P0138	Heated oxygen sensor 2 (bank 1) circuit high voltage	B)	The minimum voltage from the sensor is not reached to the specified voltage.	 Harness or connectors (The sensor circuit is open or shorted) Heated oxygen sensor 2 Fuel pressure Fuel injector

P0138, P0158 HO2S2

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

< DTC/CIF	RCUIT DIAGNOSIS >			[VK50VE]
DTC No.	Trouble diagnosis name		DTC detecting condition	Possible cause
		A)	An excessively high voltage from the sensor is sent to ECM.	Harness or connectors (The sensor circuit is open or shorted) Heated oxygen sensor 2
P0158	Heated oxygen sensor 2 (bank 2) circuit high voltage	В)	The minimum voltage from the sensor is not reached to the specified voltage.	 Harness or connectors (The sensor circuit is open or shorted) Heated oxygen sensor 2 Fuel pressure Fuel injector
	IFIRMATION PROCED ONDITIONING	DUR	E	
efore con . Turn iç . Turn iç	onfirmation Procedure haducting the next test. gnition switch OFF and wition switch ON. gnition switch OFF and wition switch of swit	/ait a	at least 10 seconds.	s perform the following procedure
_	> GO TO 2. PRM DTC CONFIRMATION	ON P	PROCEDURE FOR MALFUNCTION	N A
. Turn iç . Turn iç . Turn iç . Start e . Let en	gnition switch OFF and w gnition switch ON. gnition switch OFF and w	/ait a /ait a	at least 10 seconds.	n for at least 1 minute under no load.
YES >: NO-1 >:	OTC detected? > Go to <u>EC-823, "Diagno</u> > With CONSULT-III: GC > With GST: GO TO 5.			
.PERFO	RM DTC CONFIRMATION	ON P	ROCEDURE FOR MALFUNCTION	NB
) With Co	ONSULT-III			
. Start e . Turn iç	engine and warm it up to gnition switch OFF and w	the r	RK SUPPORT" at a temperature normal operating temperature. at least 10 seconds.	of 0 to 30°C (32 to 86°F).
. Turn iç . Start e	gnition switch ON. gnition switch OFF and w engine and keep the engi gine idle for 1 minute.			n for at least 1 minute under no load.
SelectCheckIf not,	"DATA MONITOR" mode that "COOLAN TEMP/S warm up engine and go	" ind	h CONSULT-III. licates more than 70°C (158°F). ext step when "COOLAN TEMP/S"	indication reaches 70°C (158°F).
0. Select "DTC"	engine hood. "HO2S2 (B1) P1146" (f WORK SUPPORT" mod the instruction of CONS	e wit	h CONSULT-III.	6" (for DTC P0158) of "HO2S2" in
NOTE It will t	:	until	"COMPLETED" is displayed.	

12. Touch "SELF-DIAG RESULTS".

Which is displayed on CONSULT-III screen?

OK >> INSPECTION END

NG >> Go to EC-823, "Diagnosis Procedure".

CON NOT BE DIAGNOSED>>GO TO 4.

Revision: 2009 March **EC-821** 2009 FX35/FX50

< DTC/CIRCUIT DIAGNOSIS >

4.PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION B AGAIN

- 1. Turn ignition switch OFF and leave the vehicle in a cool place (soak the vehicle).
- 2. Perform DTC confirmation procedure again.

>> GO TO 3.

5. PERFORM COMPONENT FUNCTION CHECK FOR MALFUNCTION B

With GST

Perform component function check. Refer to EC-822, "Component Function Check".

NOTE:

Use component function check to check the overall function of the heated oxygen sensor 2 circuit. During this check, a 1st trip DTC might not be confirmed.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-823, "Diagnosis Procedure".

Component Function Check

INFOID:0000000003958756

1.PERFORM COMPONENT FUNCTION CHECK-I

With GST

- 1. Start engine and warm it up to the normal operating temperature.
- Turn ignition switch OFF and wait at least 10 seconds.
- 3. Turn ignition switch ON.
- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- 6. Let engine idle for 1 minute.
- 7. Check the voltage between ECM harness connector terminals under the following conditions.

		ECM					
DTC Connecto		+	_	Condition	Voltage		
	Connector	Terminal Terminal					
P0138	F110	32	31	Revving up to 4,000 rpm under no load at			
P0158			31	least 10 times	least once during this procedure.		

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.PERFORM COMPONENT FUNCTION CHECK-II

Check the voltage between ECM harness connector terminals under the following conditions.

	ECM					
DTC		+	_	Condition	Voltage	
	Connector	Connector Terminal Terminal				
P0138	F110	32	31	Keeping engine at idle for 10 minutes	The voltage should be below 0.18 V at	
P0158	1 110	36 Keeping engine at idle for 10 minutes		Reeping engine at idle for 10 minutes	least once during this procedure.	

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 3.

3. PERFORM COMPONENT FUNCTION CHECK-III

Check the voltage between ECM harness connector terminals under the following conditions.

INFOID:0000000003958757

Α

F

K

		ECM				
DTC	DTC		_	Condition	Voltage	
P0138	F110	32	31	Coasting from 80 km/h (50 MPH) with se-	The voltage should be below 0.18 V at least once during this procedure.	
P0158	1 110	36	31	lector lever in the D position		
		14	10			

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-823, "Diagnosis Procedure".

Diagnosis Procedure

1. INSPECTION START

Confirm the detected malfunction (A or B). Refer to EC-820, "DTC Logic".

Which malfunction is detected?

A >> GO TO 2

B >> GO TO 9.

2. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- 2. Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace ground connection.

3.check heated oxygen sensor 2 connector

- 1. Disconnect heated oxygen sensor 2 (HO2S2) harness connector.
- Check that water is not inside connectors.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace harness or connectors.

f 4.CHECK HO2S2 GROUND CIRCUIT FOR OPEN AND SHORT

- Disconnect ECM harness connector.
- 2. Check the continuity between HO2S2 harness connector and ECM harness connector.

DTC		HO2S2		EC	Continuity	
ыс	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0138	1	F87	1	F110	31	Existed
P0158	2	F88	1	1110	31	LAISIEU

3. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

${f 5.}$ CHECK HO2S2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between HO2S2 harness connector and ECM harness connector.

DTC		HO2S2		EC	Continuity	
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0138	1	F87	4	F110	32	Existed
P0158	3 2 F88		4	1 110	36	LAISIEU

< DTC/CIRCUIT DIAGNOSIS >

Check the continuity between HO2S2 harness connector and ground, or ECM harness connector and ground.

DTC	HO2S2			EC	CM	Ground	Continuity
ыс	Bank	Connector	Terminal	Connector	Terminal	Oround	Continuity
P0138	1	F87	4	F110	32	Ground	Not existed
P0158	2	F88	4	FIIU	36	Ground	Not existed

3. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

6.CHECK HEATED OXYGEN SENSOR 2

Refer to EC-826, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 8. NO >> GO TO 7.

.REPLACE HEATED OXYGEN SENSOR 2

Replace malfunctioning heated oxygen sensor 2.

CAUTION:

- Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J-43897-12)] and approved anti-seize lubricant (commercial service tool).

>> INSPECTION END

8. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

9. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair or replace ground connection.

10.CLEAR THE MIXTURE RATIO SELF-LEARNING VALUE

- Clear the mixture ratio self-learning value. Refer to <u>EC-586</u>, "MIXTURE RATIO SELF-LEARNING VALUE CLEAR: Special Repair Requirement".
- 2. Run engine for at least 10 minutes at idle speed.

Is the 1st trip DTC P0172 or P0175 detected? Is it difficult to start engine?

YES >> Perform trouble diagnosis for DTC P0172, P0175. Refer to EC-838, "DTC Logic".

NO >> GO TO 11.

11. CHECK HEATED OXYGEN SENSOR 2 GROUND CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- 2. Disconnect heated oxygen sensor 2 (HO2S2) harness connector.
- 3. Disconnect ECM harness connector.
- Check the continuity between HO2S2 harness connector and ECM harness connector.

DTC		HO2S2		EC	Continuity		
ыс	Bank Connector		Terminal	Connector Terminal		Continuity	
P0138	1	F87	1	F110	31	Existed	
P0158	P0158 2		1	1 110	31	LAISIEU	

EC

Α

5. Also check harness for short to ground and short to power.

Is the inspection result normal?

>> GO TO 12.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

12. CHECK HO2S2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

Check the continuity between HO2S2 harness connector and ECM harness connector.

DTC		HO2S2		EC	Continuity	
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0138	1	F87	4	F110	32	Existed
P0158	2 F88		4	FIIU	36	Existed

Check the continuity between HO2S2 harness connector and ground, or ECM harness connector and ground.

DTC	HO2S2			EC	CM	Ground	Continuity
ыс	Bank	Connector	Terminal	Connector	Terminal	Olouliu	Continuity
P0138	1	F87	4	F110	32	Ground	Not existed
P0158	2	F88	4	1 110	36	Giodila	INOL EXISTED

3. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 13.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

13. CHECK HEATED OXYGEN SENSOR 2

Refer to EC-826, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 15.

NO >> GO TO 14.

14.replace heated oxygen sensor 2

Replace malfunctioning heated oxygen sensor 2.

CAUTION:

- Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J-43897-12)] and approved anti-seize lubricant (commercial service tool).

>> INSPECTION END

15. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

EC-825 Revision: 2009 March 2009 FX35/FX50

D

Е

Р

< DTC/CIRCUIT DIAGNOSIS >

Component Inspection

INFOID:0000000004032230

1. INSPECTION START

Will CONSULT-III be used?

Will CONSULT-III be used?

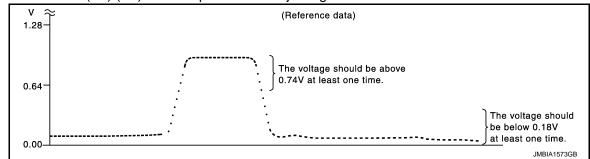
YES >> GO TO 2.

NO >> GO TO 3.

2.CHECK HEATED OXYGEN SENSOR 2

(P) With CONSULT-III

- 1. Start engine and warm it up to the normal operating temperature.
- 2. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- Let engine idle for 1 minute.
- 4. Select "FUEL INJECTION" in "ACTIVE TEST" mode, and select "HO2S2 (B1)/(B2)" as the monitor item with CONSULT-III.
- 5. Check "HO2S2 (B1)/(B2)" at idle speed when adjusting "FUEL INJECTION" to ±25%.



"HO2S2 (B1)/(B2)" should be above 0.74 V at least once when the "FUEL INJECTION" is +25%. "HO2S2 (B1)/(B2)" should be below 0.18 V at least once when the "FUEL INJECTION" is -25%.

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 6.

3.CHECK HEATED OXYGEN SENSOR 2-I

Without CONSULT-III

- 1. Start engine and warm it up to the normal operating temperature.
- Turn ignition switch OFF and wait at least 10 seconds.
- Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- 4. Let engine idle for 1 minute.
- 5. Check the voltage between ECM harness connector terminals under the following conditions.

ECM				
Connector	+	_	Condition	Voltage
	Terminal	Terminal		
F110	32 [HO2S2 (bank 1)]	- 31	Revving up to 4,000 rpm under no load at least 10 times	The voltage should be above 0.74 V at least once during this procedure. The voltage should be below 0.18 V at least once during this procedure.
	36 [HO2S2 (bank 2)]			

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 4.

4. CHECK HEATED OXYGEN SENSOR 2-II

Check the voltage between ECM harness connector terminals under the following conditions.

ECM				
Connector -	+	_	Condition	Voltage
	Terminal	Terminal		
F110	32 [HO2S2 (bank 1)]	- 31	Keeping engine at idle for 10 minutes	The voltage should be above 0.74 V at least once during this procedure. The voltage should be below 0.18 V at least once during this procedure.
	36 [HO2S2 (bank 2)]			

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 5.

5. CHECK HEATED OXYGEN SENSOR 2-III

Check the voltage between ECM harness connector terminals under the following conditions.

ECM				
Connector	+	_	Condition	Voltage
	Terminal	Terminal		
F110	32 [HO2S2 (bank 1)]	- 31	Coasting from 80 km/h (50 MPH) with selector lever in the D position	The voltage should be above 0.74 V at least once during this procedure. The voltage should be below 0.18 V at least once during this procedure.
	36 [HO2S2 (bank 2)]			

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 6.

6.REPLACE HEATED OXYGEN SENSOR 2

Replace malfunctioning heated oxygen sensor 2.

CAUTION:

- Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J-43897-12)] and approved anti-seize lubricant (commercial service tool).

>> INSPECTION END

С

EC

Α

D

Е

F

Н

- 1

K

M

Ν

O

Р

INFOID:0000000003958760

P0139, P0159 HO2S2

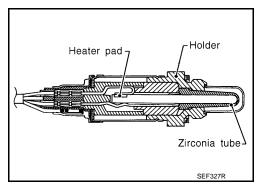
Description

The heated oxygen sensor 2, after three way catalyst (manifold), monitors the oxygen level in the exhaust gas on each bank.

Even if switching characteristics of the air fuel ratio (A/F) sensor 1 are shifted, the air fuel ratio is controlled to stoichiometric, by the signal from the heated oxygen sensor 2.

This sensor is made of ceramic zirconia. The zirconia generates voltage from approximately 1 V in richer conditions to 0 V in leaner conditions.

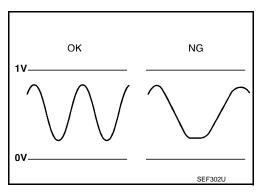
Under normal conditions the heated oxygen sensor 2 is not used for engine control operation.



DTC Logic

DTC DETECTION LOGIC

The heated oxygen sensor 2 has a much longer switching time between rich and lean than the air fuel ratio (A/F) sensor 1. The oxygen storage capacity of the three way catalyst (manifold) causes the longer switching time. To judge the malfunctions of heated oxygen sensor 2, ECM monitors whether the switching response of the sensor's voltage is faster than specified during various driving conditions such as fuel cut.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0139	Heated oxygen sensor 2 (bank 1) circuit slow response	between rich and lean than the specified time.	 Harness or connectors (The sensor circuit is open or shorted) Heated oxygen sensor 2 Fuel pressure Fuel injector Intake air leaks
P0159	Heated oxygen sensor 2 (bank 2) circuit slow response		

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

Will CONSULT-III be used?

YES >> GO TO 2. NO >> GO TO 4.

2.PERFORM DTC CONFIRMATION PROCEDURE

(P) With CONSULT-III

TESTING CONDITION:

For better results, perform "DTC WORK SUPPORT" at a temperature of 0 to 30°C (32 to 86°F).

- 1. Start engine and warm it up to the normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Turn ignition switch ON.

< DTC/CIRCUIT DIAGNOSIS >

- Turn ignition switch OFF and wait at least 10 seconds.
- Restart engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no 5.
- 6. Let engine idle for 1 minute.
- Select "DATA MONITOR" mode with CONSULT-III.
- 8. Check that "COOLAN TEMP/S" indicates more than 70°C (158°F). If not, warm up engine and go to next step when "COOLAN TEMP/S" indication reaches to 70°C (158°F).
- Open engine hood.
- 10. Select "HO2S2 (B1) P0139" or "HO2S2 (B2) P0159" of "HO2S2" in "DTC WORK SUPPORT" mode with CONSULT-III.
- 11. Start engine and follow the instruction of CONSULT-III display.

NOTE:

It will take at most 10 minutes until "COMPLETED" is displayed.

12. Touch "SELF-DIAG RESULTS".

Which is displayed on CONSULT-III screen?

OK >> INSPECTION END

NG >> Go to EC-830, "Diagnosis Procedure".

CAN NOT BE DIAGNOSED>>GO TO 3.

3.perform dtc confirmation procedure again

- Turn ignition switch OFF and leave the vehicle in a cool place (soak the vehicle).
- Perform DTC confirmation procedure again.

>> GO TO 2.

4. PERFORM COMPONENT FUNCTION CHECK

Perform component function check. Refer to EC-829, "Component Function Check".

NOTE:

Use component function check to check the overall function of the heated oxygen sensor 2 circuit. During this check, a 1st trip DTC might not be confirmed.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-830, "Diagnosis Procedure".

Component Function Check

1.PERFORM COMPONENT FUNCTION CHECK-I

With GST

- 1. Start engine and warm it up to the normal operating temperature.
- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.
- 5. Restart engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- Let engine idle for 1 minute.
- Check the voltage between ECM harness connector terminals under the following conditions.

	ECM						
DTC	Connector	+	_	Condition	Voltage		
		Terminal	Terminal				
P0139	F110	32	31	Revving up to 4,000 rpm under no load at	A change of voltage should be more than		
P0159	FIIU	36	31	least 10 times	0.24 V for 1 second during this procedure.		

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

EC-829 Revision: 2009 March 2009 FX35/FX50

EC

[VK50VE]

D

Н

INFOID:0000000003958761

M

Ν

Р

[VK50VE]

< DTC/CIRCUIT DIAGNOSIS >

2.perform component function check-ii

Check the voltage between ECM harness connector terminals under the following conditions.

	ECM					
DTC	Connector	+	_	Condition	tion Voltage	
		Terminal	Terminal			
P0139	F110	32	31	Keeping engine at idle for 10 minutes	A change of voltage should be more than 0.24 V for 1 second during this procedure.	
P0159	FIIU	36	31	Keeping engine at idle for 10 minutes		

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 3.

3. PERFORM COMPONENT FUNCTION CHECK-III

Check the voltage between ECM harness connector terminals under the following conditions.

		ECM				
DTC	Connector	+	_	Condition	Voltage	
		Terminal	Terminal			
P0139	F110 32 31	Coasting from 80 km/h (50 MPH) with se-	A change of voltage should be more than			
P0159	1 110	36	31	lector lever in the D position	0.24 V for 1 second during this procedure.	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-830, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003958762

1. CHECK GROUND CONNECTION

- Turn ignition switch OFF.
- 2. Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CLEAR THE MIXTURE RATIO SELF-LEARNING VALUE

- Clear the mixture ratio self-learning value. Refer to <u>EC-586, "MIXTURE RATIO SELF-LEARNING VALUE CLEAR: Special Repair Requirement"</u>.
- 2. Run engine for at least 10 minutes at idle speed.

Is the 1st trip DTC P0171, P0172, P0174 or P0175 detected? Is it difficult to start engine?

YES >> Perform trouble diagnosis for DTC P0171, P0174 or P0172, P0175. Refer to <u>EC-834, "DTC Logic"</u> or <u>EC-838, "DTC Logic"</u>.

NO >> GO TO 3.

3.check heated oxygen sensor 2 ground circuit for open and short

- Turn ignition switch OFF.
- Disconnect heated oxygen sensor 2 (HO2S2) harness connector.
- Disconnect ECM harness connector.
- Check the continuity between HO2S2 harness connector and ECM harness connector.

DTC		HO2S2		EC	Continuity	
ыс	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0139	1	F87	1	F110	31	Existed
P0159	2	F88	1	1 110	31	LAISIEU

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

4.CHECK HO2S2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

Check the continuity between HO2S2 harness connector and ECM harness connector.

DTC		HO2S2		ECM		Continuity
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0139	1	F87	4	F110	32	Existed
P0159	2	F88	4	FIIU	36	Existed

Check the continuity between HO2S2 harness connector and ground, or ECM harness connector and ground.

DTC	HO2S2			EC	CM	Ground	Continuity
DIC	Bank	Connector	Terminal	Connector	Terminal		Continuity
P0139	1	F87	4	F110	32	Ground	Not existed
P0159	2	F88	4	1 110	36		NOI EXISIEU

3. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

5 .CHECK HEATED OXYGEN SENSOR 2

Refer to EC-831, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 6.

6.REPLACE HEATED OXYGEN SENSOR 2

Replace malfunctioning heated oxygen sensor 2.

CAUTION:

- Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J-43897-12)] and approved anti-seize lubricant (commercial service tool).

>> INSPECTION END

7. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

1.INSPECTION START

Will CONSULT-III be used?

Will CONSULT-III be used?

YES >> GO TO 2.

NO >> GO TO 3.

Revision: 2009 March

EC-831

EC

Α

Е

D

F

Н

M

Ν

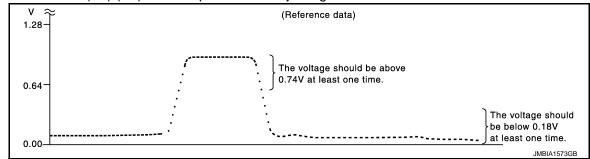
2009 FX35/FX50

INFOID:0000000004032231

2.CHECK HEATED OXYGEN SENSOR 2

(II) With CONSULT-III

- 1. Start engine and warm it up to the normal operating temperature.
- 2. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- Let engine idle for 1 minute.
- Select "FUEL INJECTION" in "ACTIVE TEST" mode, and select "HO2S2 (B1)/(B2)" as the monitor item with CONSULT-III.
- 5. Check "HO2S2 (B1)/(B2)" at idle speed when adjusting "FUEL INJECTION" to ±25%.



"HO2S2 (B1)/(B2)" should be above 0.74 V at least once when the "FUEL INJECTION" is +25%. "HO2S2 (B1)/(B2)" should be below 0.18 V at least once when the "FUEL INJECTION" is -25%.

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 6.

3.check heated oxygen sensor 2-1 $\,$

₩ Without CONSULT-III

- 1. Start engine and warm it up to the normal operating temperature.
- Turn ignition switch OFF and wait at least 10 seconds.
- 3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- 4. Let engine idle for 1 minute.
- Check the voltage between ECM harness connector terminals under the following conditions.

ECM					
Connector	+	_	Condition	Voltage	
Comilector	Terminal	Terminal			
F110	32 [HO2S2 (bank 1)]	24	Revving up to 4,000 rpm under no load at	The voltage should be above 0.74 V at least once during this procedure.	
F110	36 [HO2S2 (bank 2)]		least 10 times	The voltage should be below 0.18 V at least once during this procedure.	

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 4.

4. CHECK HEATED OXYGEN SENSOR 2-II

Check the voltage between ECM harness connector terminals under the following conditions.

Α

EC

D

Е

F

Н

ECM					
Connector	+	_	Condition	Voltage	
Connector	Terminal	Terminal			
F110	32 [HO2S2 (bank 1)]	21	Keeping engine at idle for 10 minutes	The voltage should be above 0.74 V at least once during this procedure.	
FIIO	36 [HO2S2 (bank 2)]	31		The voltage should be below 0.18 V at least once during this procedure.	

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 5.

5. CHECK HEATED OXYGEN SENSOR 2-III

Check the voltage between ECM harness connector terminals under the following conditions.

	ECM				
Connector	+ -		Condition	Voltage	
Connector	Terminal	Terminal			
F110	32 [HO2S2 (bank 1)]	31	Coasting from 80 km/h (50 MPH) with selector lever in the D position	The voltage should be above 0.74 V at least once during this procedure. The voltage should be below 0.18 V at least once during this procedure.	
1 110	36 [HO2S2 (bank 2)]	31			

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 6.

6.REPLACE HEATED OXYGEN SENSOR 2

Replace malfunctioning heated oxygen sensor 2.

CAUTION:

- Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J-43897-12)] and approved anti-seize lubricant (commercial service tool).

>> INSPECTION END

M

K

N

 \cap

Р

P0171, P0174 FUEL INJECTION SYSTEM FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

P0171, P0174 FUEL INJECTION SYSTEM FUNCTION

DTC Logic

DTC DETECTION LOGIC

With the Air/Fuel Mixture Ratio Self-Learning Control, the actual mixture ratio can be brought closely to the theoretical mixture ratio based on the mixture ratio feedback signal from A/F sensor 1. The ECM calculates the necessary compensation to correct the offset between the actual and the theoretical ratios.

In case the amount of the compensation value is extremely large (the actual mixture ratio is too lean), the ECM judges the condition as the fuel injection system malfunction and illuminates the MIL (2 trip detection logic).

Sensor	Input signal to ECM	ECM function	Actuator	
A/F sensor 1	Density of oxygen in exhaust gas (Mixture ratio feedback signal)	Fuel injection control	Fuel injector	

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0171	Fuel injection system too lean (bank 1)		Intake air leakage A/F sensor 1
P0174	Fuel injection system too lean (bank 2)	Fuel injection system does not operate properly. The amount of mixture ratio compensation is too large. (The mixture ratio is too lean.)	 Fuel injector Exhaust gas leakage Incorrect fuel pressure Lack of fuel Mass air flow sensor Incorrect PCV hose connection

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE-I

- Clear the mixture ratio self-learning value. Refer to <u>EC-586</u>, "MIXTURE RATIO SELF-LEARNING VALUE <u>CLEAR</u>: Special Repair Requirement".
- 2. Start engine.

Is it difficult to start engine?

YES >> GO TO 3.

NO >> GO TO 4.

3. RESTART ENGINE

If it is difficult to start engine, the fuel injection system has a malfunction, too.

Crank engine while depressing accelerator pedal.

NOTE:

When depressing accelerator pedal three fourths (3/4) or more, the control system does not start the engine. Do not depress accelerator pedal too much.

Does engine start?

YES >> Go to EC-835, "Diagnosis Procedure".

NO >> Check exhaust and intake air leakage visually.

4. PERFORM DTC CONFIRMATION PROCEDURE-II

- Keep engine idle for at least 5 minutes.
- 2. Check 1st trip DTC.

P0171, P0174 FUEL INJECTION SYSTEM FUNCTION

[VK50VE] < DTC/CIRCUIT DIAGNOSIS > Is 1st trip DTC detected? Α YES >> Go to EC-835, "Diagnosis Procedure". NO >> GO TO 5. 5. PERFORM DTC CONFIRMATION PROCEDURE-III EC Turn ignition switch OFF and wait at least 10 seconds. 2. Turn ignition switch ON. 3. Turn ignition switch OFF and wait at least 10 seconds. Start engine. 4. Maintain the following conditions for at least 10 consecutive minutes. Hold the accelerator pedal as steady as possible. D Vehicle speed 50 - 120 km/h (31 - 75 MPH) **CAUTION:** Е Always drive vehicle at a safe speed. Check 1st trip DTC. Is 1st trip DTC detected? F YES >> Go to EC-835, "Diagnosis Procedure". NO >> INSPECTION END Diagnosis Procedure INFOID:0000000003958765 1. CHECK EXHAUST GAS LEAKAGE Start engine and run it at idle. Н Listen for an exhaust gas leakage before three way catalyst (manifold). Three way catalyst Three way catalyst Muffler (Manifold) (Under floor) HO2S2 A/F sensor To exhaust manifold : Exhaust gas PRIR1216F Is exhaust gas leakage detected? YES >> Repair or replace malfunctioning part. NO >> GO TO 2. 2.CHECK FOR INTAKE AIR LEAKAGE Listen for an intake air leakage after the mass air flow sensor. Check PCV hose connection. Is intake air leakage detected? Ν YES >> Repair or replace malfunctioning part. NO >> GO TO 3. 3.check a/f sensor 1 input signal circuit Turn ignition switch OFF. Disconnect corresponding A/F sensor 1 harness connector. 2. Disconnect ECM harness connector. Р Check the continuity between A/F sensor 1 harness connector and ECM harness connector.

DTC		A/F sensor	1	EC	Continuity	
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0171	1	F67	1		81	Existed
FUITI	'	107	2	F111	82	
P0174	2 F68	E60	1	1 111	85	LAISIEU
F0174		2		86	_	

Check the continuity between A/F sensor 1 harness connector and ground, or ECM harness connector and ground.

DTC	A/F sensor		1	ECM		Ground	Continuity
DIC	Bank	Connector	Terminal	Connector	Terminal	Giodila	Continuity
P0171	1	F67	1		81		
FUITI	'	Γ0/	2	F111	82	Ground	Not existed
P0174	2	F68	1	1 111	85	Giodila	Not existed
F0174	2	1 00	2		86		

Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

4. CHECK FUEL PRESSURE

Check fuel pressure. Refer to EM-173, "Inspection".

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check fuel hoses and fuel tubes for clogging.

Is the inspection result normal?

YES >> Replace "fuel filter and fuel pump assembly".

NO >> Repair or replace malfunctioning part.

6.CHECK MASS AIR FLOW SENSOR

(II) With CONSULT-III

- Install all removed parts.
- Check "MASS AIR FLOW" in "DATA MONITOR" mode with CONSULT-III. For specification, refer to EC-1233, "Mass Air Flow Sensor".
- With GST
- 1. Install all removed parts.
- Check mass air flow sensor signal in Service \$01 with GST. For specification, refer to <u>EC-1233</u>, "Mass Air Flow Sensor".

Is the measurement value within the specification?

YES >> GO TO 7.

NO >> Check connectors for rusted terminals or loose connections in the mass air flow sensor circuit or grounds. Refer to EC-776, "Diagnosis Procedure".

7.CHECK FUNCTION OF FUEL INJECTOR

(P) With CONSULT-III

- Start engine.
- 2. Perform "POWER BALANCE" in "ACTIVE TEST" mode with CONSULT-III.
- Check that each circuit produces a momentary engine speed drop.
- Without CONSULT-III
- 1. Start engine and let it idle.

P0171, P0174 FUEL INJECTION SYSTEM FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Listen to each fuel injector operating sound.

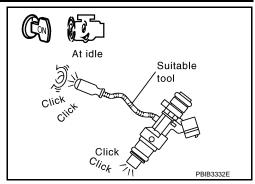
Clicking sound should be heard.

Is the inspection result normal?

YES >> GO TO 8.

NO

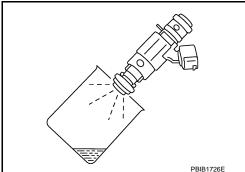
>> Perform trouble diagnosis for FUEL INJECTOR, refer to EC-1096. "Diagnosis Procedure".



8. CHECK FUEL INJECTOR

- Turn ignition switch OFF.
- Confirm that the engine is cooled down and there are no fire hazards near the vehicle.
- Disconnect all fuel injector harness connectors.
- Remove fuel tube assembly. Refer to EM-182, "Removal and Installation". Keep fuel hose and all fuel injectors connected to fuel tube.
- 5. For DTC P0171, reconnect fuel injector harness connectors on bank 1. For DTC P0174, reconnect fuel injector harness connectors on bank 2.
- 6. Disconnect all ignition coil harness connectors.
- 7. Prepare pans or saucers under each fuel injector.
- 8. Crank engine for approximately 3 seconds. For DTC P0171, check that fuel sprays out from fuel injectors on

For DTC P0174, check that fuel sprays out from fuel injectors on bank 2.



Fuel should be sprayed evenly for each fuel injector.

Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace fuel injectors from which fuel does not spray out. Always replace O-ring with new ones.

9. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Α

EC

Е

D

F

Ν

Р

P0172, P0175 FUEL INJECTION SYSTEM FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

P0172, P0175 FUEL INJECTION SYSTEM FUNCTION

DTC Logic

DTC DETECTION LOGIC

With the Air/Fuel Mixture Ratio Self-Learning Control, the actual mixture ratio can be brought closely to the theoretical mixture ratio based on the mixture ratio feedback signal from A/F sensor 1. The ECM calculates the necessary compensation to correct the offset between the actual and the theoretical ratios.

In case the amount of the compensation value is extremely large (the actual mixture ratio is too rich), the ECM judges the condition as the fuel injection system malfunction and illuminates the MIL (2 trip detection logic).

Sensor	Input signal to ECM	ECM function	Actuator
A/F sensor 1	Density of oxygen in exhaust gas (Mixture ratio feedback signal)	Fuel injection control	Fuel injector

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0172	Fuel injection system too rich (bank 1)	Fuel injection system does not operate properly.	A/F sensor 1 Fuel injector
P0175	Fuel injection system too rich (bank 2)	The amount of mixture ratio compensation is too large. (The mixture ratio is too rich.)	 Exhaust gas leakage Incorrect fuel pressure Mass air flow sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE-I

- Clear the mixture ratio self-learning value. Refer to <u>EC-586</u>, "MIXTURE RATIO SELF-LEARNING VALUE CLEAR: Special Repair Requirement".
- Start engine.

Is it difficult to start engine?

YES >> GO TO 3.

NO >> GO TO 4.

3. RESTART ENGINE

If it is difficult to start engine, the fuel injection system has a malfunction, too.

Crank engine while depressing accelerator pedal.

NOTE:

When depressing accelerator pedal three fourths (3/4) or more, the control system does not start the engine. Do not depress accelerator pedal too much.

Does engine start?

YES >> Go to EC-839, "Diagnosis Procedure".

NO >> Remove spark plugs and check for fouling, etc.

f 4.PERFORM DTC CONFIRMATION PROCEDURE-II

- Keep engine idle for at least 5 minutes.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-839, "Diagnosis Procedure".

NO >> GO TO 5.

P0172, P0175 FUEL INJECTION SYSTEM FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

5.PERFORM DTC CONFIRMATION PROCEDURE-III

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON. 2.
- 3. Turn ignition switch OFF and wait at least 10 seconds.
- 4. Start engine.
- Maintain the following conditions for at least 10 consecutive minutes.

Hold the accelerator pedal as steady as possible.

Vehicle speed 50 - 120 km/h (31 - 75 MPH)

CAUTION:

Always drive vehicle at a safe speed.

Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-839, "Diagnosis Procedure".

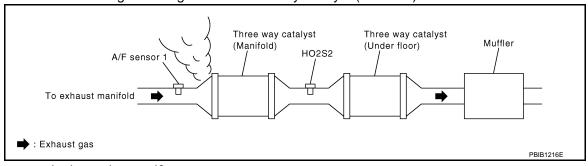
>> INSPECTION END NO

Diagnosis Procedure

1. CHECK EXHAUST GAS LEAKAGE

Listen for an exhaust gas leakage before three way catalyst (manifold). 2.

Start engine and run it at idle.



Is exhaust gas leakage detected?

YES >> Repair or replace malfunctioning part.

NO >> GO TO 2.

2.CHECK FOR INTAKE AIR LEAKAGE

Listen for an intake air leakage after the mass air flow sensor.

Is intake air leakage detected?

YES >> Repair or replace malfunctioning part.

NO >> GO TO 3.

3.check a/f sensor 1 input signal circuit

- 1. Turn ignition switch OFF.
- 2. Disconnect corresponding A/F sensor 1 harness connector.
- Disconnect ECM harness connector.
- Check the continuity between A/F sensor 1 harness connector and ECM harness connector.

DTC		A/F sensor	ensor 1 E		CM	Continuity		
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity		
P0172	1	F67	1		81			
F0172	Į į	F07	F07	107	2	F111	82	Existed
D0175	P0175 2 I	P0175 2 F68 —	1	1 111	85	LXISIGU		
		F00	2		86			

Check the continuity between A/F sensor 1 harness connector and ground, or ECM harness connector and ground.

[VK50VE]

EC

D

Е

INFOID:0000000003958767

M

Ν

Р

EC-839 Revision: 2009 March 2009 FX35/FX50

DTC	A/F sensor 1		ECM		Ground	Continuity	
DIC	Bank	Connector	Terminal	Connector	Terminal	Giodila	Continuity
P0172	1	F67	1		81		
FUITZ	'	F0/	2	F111	82	Ground	Not existed
P0175	2	F68	1	ГШ	85	Oround	
		F00	2		86		

6. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

4. CHECK FUEL PRESSURE

Check fuel pressure. Refer to EM-173, "Inspection".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace "fuel filter and fuel pump assembly".

5.CHECK MASS AIR FLOW SENSOR

(P) With CONSULT-III

- 1. Install all removed parts.
- 2. Check "MASS AIR FLOW" in "DATA MONITOR" mode with CONSULT-III. For specification, refer to <u>EC-1233</u>, "Mass Air Flow Sensor".
- With GST
- 1. Install all removed parts.
- Check mass air flow sensor signal in "Service \$01" with GST. For specification, refer to EC-1233, "Mass Air Flow Sensor".

Is the measurement value within the specification?

YES >> GO TO 6.

NO >> Check connectors for rusted terminals or loose connections in the mass air flow sensor circuit or grounds. Refer to EC-776, "Diagnosis Procedure".

6.CHECK FUNCTION OF FUEL INJECTOR

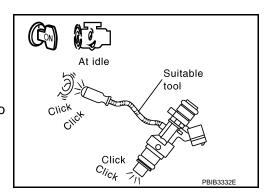
- (P) With CONSULT-III
- Start engine.
- 2. Perform "POWER BALANCE" in "ACTIVE TEST" mode with CONSULT-III.
- 3. Check that each circuit produces a momentary engine speed drop.
- 1. Start engine and let it idle.
- 2. Listen to each fuel injector operating sound.

Clicking sound should be heard.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Perform trouble diagnosis for FUEL INJECTOR, refer to <u>EC-1096</u>, "Diagnosis Procedure".



7. CHECK FUEL INJECTOR

- Remove fuel injector assembly. Refer to <u>EM-182, "Removal and Installation"</u>. Keep fuel hose and all fuel injectors connected to fuel tube.
- 2. Confirm that the engine is cooled down and there are no fire hazards near the vehicle.
- Disconnect all fuel injector harness connectors.

P0172, P0175 FUEL INJECTION SYSTEM FUNCTION [VK50VE] < DTC/CIRCUIT DIAGNOSIS > Disconnect all ignition coil harness connectors. Prepare pans or saucers under each fuel injector. Α Crank engine for approximately 3 seconds. Check that fuel does not drip from fuel injector. Is the inspection result normal? EC YES >> GO TO 8. NO >> Replace the fuel injectors from which fuel is dripping. Always replace O-ring with new one. 8. CHECK INTERMITTENT INCIDENT C Refer to GI-35, "Intermittent Incident". D >> INSPECTION END Е F Н K

L

M

Ν

0

Р

Revision: 2009 March EC-841 2009 FX35/FX50

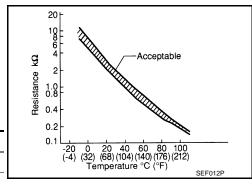
P0181 FTT SENSOR

Description

The fuel tank temperature sensor is used to detect the fuel temperature inside the fuel tank. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the fuel temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.

<Reference data>

Fuel temperature [°C (°F)]	Voltage* (V)	Resistance (kΩ)
20 (68)	3.5	2.3 - 2.7
50 (122)	2.2	0.79 - 0.90



^{*:} These data are reference values and are measured between ECM terminals 120 (Fuel tank temperature sensor) and 128 (ECM ground).

DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0181	Fuel tank temperature sensor circuit range/ performance	Rationally incorrect voltage from the sensor is sent to ECM, compared with the voltage signals from engine coolant temperature sensor and intake air temperature sensor.	 Harness or connectors (The sensor circuit is open or shorted) Fuel tank temperature sensor Unified meter and A/C amp.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE-I

- 1. Turn ignition switch ON and wait at least 10 seconds.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-843, "Diagnosis Procedure".

NO >> GO TO 3.

3.check engine coolant temperature

- (II) With CONSULT-III
- Select "COOLAN TEMP/S" in "DATA MONITOR" with CONSULT-III.
- Check "COOLAN TEMP/S" value.
- With GST

Follow the procedure "With CONSULT-III" above.

"COOLAN TEMP/S" less than 60°C (140°F)?

YES >> INSPECTION END

NO >> GO TO 4.

4. PERFORM DTC CONFIRMATION PROCEDURE-II

P0181 FTT SENSOR

[VK50VE] < DTC/CIRCUIT DIAGNOSIS > With CONSULT-III Cool engine down until "COOLAN TEMP/S" is less than 60°C (140°F). Α 2. Wait at least 10 seconds. Check 1st trip DTC. With GST EC Follow the procedure "With CONSULT-III" above. Is 1st trip DTC detected? YES >> Go to EC-843, "Diagnosis Procedure". NO >> INSPECTION END Diagnosis Procedure INFOID:0000000003958770 D 1. CHECK GROUND CONNECTION Turn ignition switch OFF. Е Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection". Is the inspection result normal? YES >> GO TO 2. NO >> Repair or replace ground connection. 2.CHECK DTC WITH "UNIFIED METER AND A/C AMP." Refer to MWI-45, "CONSULT-III Function (METER/M&A)". Is the inspection result normal? YES >> GO TO 3. >> Go to MWI-62, "Component Function Check". NO Н ${f 3.}$ CHECK FUEL TANK TEMPERATURE SENSOR POWER SUPPLY CIRCUIT Turn ignition switch OFF. Disconnect "fuel level sensor unit and fuel pump (main)" harness connector. 2. Turn ignition switch ON. 3. Check the voltage between "fuel level sensor unit and fuel pump (main)" harness connector and ground. Fuel level sensor unit and fuel pump (main) Ground Voltage (V) K Connector **Terminal** B22 4 Ground Approx. 5 Is the inspection result normal? YES >> GO TO 5. NO >> GO TO 4. **4.**DETECT MALFUNCTIONING PART M Check the following. Harness connectors M7, B1 Harness for open or short between ECM and "fuel level sensor unit and fuel pump (main)" N >> Repair open circuit, short to ground or short to power in harness or connector. 5.CHECK FUEL TANK TEMPERATURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT Turn ignition switch OFF. Disconnect "unified meter and A/C amp." harness connector. Check the continuity between "fuel level sensor unit and fuel pump (main)" harness connector and "unified meter and A/C amp." harness connector.

< DTC/CIRCUIT DIAGNOSIS >

Fuel level sensor unit and fuel pump (main)		Unified me an	Continuity	
Connector	Terminal	Connector	Terminal	
B22	5	M67	58	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- · Harness connectors M7, B1
- Harness for open or short between "fuel level sensor unit and fuel pump (main)" and "unified meter and A/C amp."

>> Repair open circuit, short to ground or short to power in harness or connector.

7. CHECK FUEL TANK TEMPERATURE SENSOR

Refer to EC-844, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 8.

NO >> Replace "fuel level sensor unit and fuel pump (main)".

8. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000003958771

1. CHECK FUEL TANK TEMPERATURE SENSOR

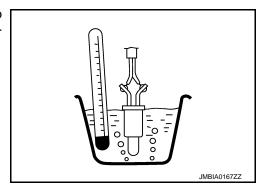
- 1. Turn ignition switch OFF.
- 2. Disconnect "fuel level sensor unit and fuel pump (main)" harness connector.
- 3. Remove fuel level sensor unit.
- Check resistance between "fuel level sensor unit and fuel pump (main)" terminals by heating with hot water as shown in the figure.

Terminals	Condition	Resistance (k Ω)	
4 and 5	Temperature [°C (°F)]	20 (68)	2.3 - 2.7
4 and 5	remperature [O (1)]	50 (122)	0.79 - 0.90

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace "fuel level sensor unit and fuel pump (main)".



[VK50VE]

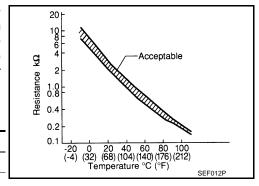
P0182, P0183 FTT SENSOR

Description INFOID:0000000004032232

The fuel tank temperature sensor is used to detect the fuel temperature inside the fuel tank. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the fuel temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.

<Reference data>

Fuel temperature [°C (°F)]	Voltage* (V)	Resistance (kΩ)
20 (68)	3.5	2.3 - 2.7
50 (122)	2.2	0.79 - 0.90



^{*:} These data are reference values and are measured between ECM terminals 120 (Fuel tank temperature sensor) and 128 (ECM ground).

DTC Logic INFOID:0000000003958773

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0182	Fuel tank temperature sensor circuit low input	An excessively low voltage from the sensor is sent to ECM.	Harness or connectors (The sensor circuit is open or shorted.)
P0183	Fuel tank temperature sensor circuit high input	An excessively high voltage from the sensor is sent to ECM.	Fuel tank temperature sensorUnified meter and A/C amp.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- Turn ignition switch ON and wait at least 5 seconds.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-845, "Diagnosis Procedure".

>> INSPECTION END NO

Diagnosis Procedure

1. CHECK GROUND CONNECTION

- Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK DTC WITH "UNIFIED METER AND A/C AMP."

Refer to MWI-45, "CONSULT-III Function (METER/M&A)".

EC-845 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

Ν

INFOID:0000000003958774

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 3.

NO >> Go to MWI-62, "Component Function Check".

3.check fuel tank temperature sensor power supply circuit

- Turn ignition switch OFF.
- 2. Disconnect "fuel level sensor unit and fuel pump (main)" harness connector.
- 3. Turn ignition switch ON.
- 4. Check the voltage between "fuel level sensor unit and fuel pump (main)" harness connector and ground.

	nsor unit and np (main)	Ground	Voltage (V)
Connector	Terminal		
B22	4	Ground	Approx. 5

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M7, B1
- Harness for open or short between ECM and "fuel level sensor unit and fuel pump (main)"
 - >> Repair open circuit, short to ground or short to power in harness or connector.

5.CHECK FUEL TANK TEMPERATURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect "unified meter and A/C amp." harness connector.
- 3. Check the continuity between "fuel level sensor unit and fuel pump (main)" harness connector and "unified meter and A/C amp." harness connector.

	Fuel level sensor unit and fuel pump (main)		Unified meter and A/C amp.	
Connector	Terminal	Connector	Terminal	
B22	5	M67	58	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M7, B1
- Harness for open or short between "fuel level sensor unit and fuel pump (main)" and "unified meter and A/C amp."
 - >> Repair open circuit, short to ground or short to power in harness or connector.

7. CHECK FUEL TANK TEMPERATURE SENSOR

Refer to EC-847, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 8.

NO >> Replace "fuel level sensor unit and fuel pump".

8. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

[VK50VE]

>> INSPECTION END

Component Inspection

INFOID:0000000004032233

1. CHECK FUEL TANK TEMPERATURE SENSOR

- Turn ignition switch OFF.
- Disconnect "fuel level sensor unit and fuel pump (main)" harness connector.
- 3. Remove fuel level sensor unit.
- 4. Check resistance between "fuel level sensor unit and fuel pump (main)" terminals by heating with hot water as shown in the figure.

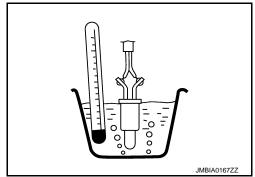
Terminals	Condition	Resistance (kΩ)	
4 and 5	Tomporature [°C (°E)]	20 (68)	2.3 - 2.7
4 and 5	and 5 Temperature [°C (°F)]		0.79 - 0.90



Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace "fuel level sensor unit and fuel pump (main)".



EC

Α

D

C

Е

F

Н

K

L

M

Ν

0

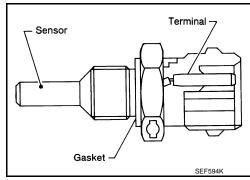
Р

EC-847 Revision: 2009 March 2009 FX35/FX50

P0196 EOT SENSOR

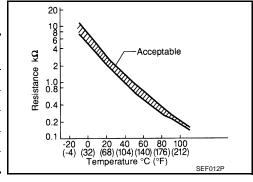
Description INFOID.000000003958776

The engine oil temperature sensor is used to detect the engine oil temperature. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the engine oil temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.



<Reference data>

Engine oil temperature [°C (°F)]	Voltage* (V)	Resistance (kΩ)
-10 (14)	4.4	7.0 - 11.4
20 (68)	3.5	2.1 - 2.9
50 (122)	2.2	0.68 - 1.00
90 (194)	0.9	0.236 - 0.260
110 (230)	0.6	0.143 - 0.153



^{*:} These data are reference values and are measured between ECM terminals 39 (Engine oil temperature sensor) and 34 (Sensor ground).

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P0196 is displayed with P0197 or P0198, first perform the trouble diagnosis for DTC P0197, P0198. Refer to EC-851, "DTC Logic".

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0196	Engine oil temperature sensor range/performance	Rationally incorrect voltage from the sensor is sent to ECM, compared with the voltage signals from engine coolant temperature sensor and intake air temperature sensor.	Harness or connectors (The sensor circuit is open or shorted) Engine oil temperature sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 11 V at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE-I

- 1. Start engine and warm it up to normal operating temperature.
- Turn ignition switch OFF and wait at least 10 seconds.

P0196 EOT SENSOR

[VK50VE] < DTC/CIRCUIT DIAGNOSIS > Turn ignition switch ON. Turn ignition switch OFF and wait at least 10 seconds. Α Start engine and let it idle for 5 minutes and 10 seconds. Check 1st trip DTC. Is 1st trip DTC detected? EC YES >> EC-849, "Diagnosis Procedure". NO >> GO TO 3. 3.PERFORM DTC CONFIRMATION PROCEDURE-II (P) With CONSULT-III Select "DATA MONITOR" mode with CONSULT-III. D Check that "COOLAN TEMP/S" indicates above 80°C (176°F). If it is above 80°C (176°F), go to the following steps. If it is below 80°C (176°F), warm engine up until "COOLAN TEMP/S" indicates more than 80°C (176°F). Then perform the following steps. Е 3. Turn ignition switch OFF and soak the vehicle in a cool place. 4. Turn ignition switch ON. NOTE: F Do not turn ignition switch OFF until step 8. 5. Select "DATA MONITOR" mode with CONSULT-III. Check the following. COOLAN TEMP/S Below 40°C (104°F) INT/A TEMP SE Below 40°C (104°F) Н Difference between "COOLAN TEMP/S" and "INT/A TEMP SE" Within 6°C (11°F) If they are within the specified range, perform the following steps. If they are out of the specified range, soak the vehicle to meet the above conditions. Then perform the following steps. NOTE: Do not turn ignition switch OFF. If it is supposed to need a long period of time, do not deplete the battery. Start engine and let it idle for 5 minutes. Check 1st trip DTC. With GST Follow the procedure "With CONSULT-III" above. Is 1st trip DTC detected? YES >> EC-849, "Diagnosis Procedure". >> INSPECTION END NO Diagnosis Procedure INFOID:0000000003958778 M 1. CHECK GROUND CONNECTION Turn ignition switch OFF. N Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection". Is the inspection result normal? YES >> GO TO 2. NO >> Repair or replace ground connection. 2.check engine oil temperature sensor Refer to EC-850, "Component Inspection". Is the inspection result normal? YES >> GO TO 3. NO >> Replace engine oil temperature sensor. 3.check intermittent incident Refer to GI-35, "Intermittent Incident"

Revision: 2009 March **EC-849** 2009 FX35/FX50

[VK50VE]

>> INSPECTION END

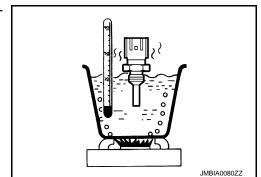
Component Inspection

INFOID:0000000003958779

1.CHECK ENGINE OIL TEMPERATURE SENSOR

- 1. Turn ignition switch OFF.
- 2. Disconnect engine oil temperature sensor harness connector.
- 3. Remove engine oil temperature sensor.
- 4. Check resistance between engine oil temperature sensor terminals by heating with hot water as shown in the figure.

Terminals	Condition	Resistance (k Ω)	
		20 (68)	2.1 - 2.9
1 and 2	Temperature [°C (°F)]	50 (122)	0.68 - 1.00
		90 (194)	0.236 - 0.260



Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace engine oil temperature sensor.

[VK50VE]

Α

EC

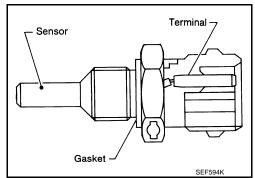
D

Е

P0197, P0198 EOT SENSOR

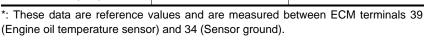
Description INFOID:0000000004032234

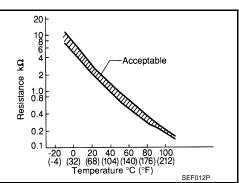
The engine oil temperature sensor is used to detect the engine oil temperature. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the engine oil temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.



<Reference data>

Engine oil temperature [°C (°F)]	Voltage* (V)	Resistance (kΩ)
-10 (14)	4.4	7.0 - 11.4
20 (68)	3.5	2.1 - 2.9
50 (122)	2.2	0.68 - 1.00
90 (194)	0.9	0.236 - 0.260
110 (230)	0.6	0.143 - 0.153





DTC Logic INFOID:0000000003958781

DTC DETECTION LOGIC

DTC No.	Trouble Diagnosis Name	DTC Detecting Condition	Possible Cause	
P0197	Engine oil temperature sensor circuit low input	An excessively low voltage from the sensor is sent to ECM.	Harness or connectors (The sensor circuit is open or shorted.)	
P0198	Engine oil temperature sensor circuit high input	An excessively high voltage from the sensor is sent to ECM.	Engine oil temperature sensor	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- Start engine and wait at least 5 seconds.
- Check 1st trip DTC. 2.

Is 1st trip DTC detected?

YES >> Go to EC-852, "Diagnosis Procedure".

NO >> INSPECTION END

M

Ν

Р

2009 FX35/FX50

P0197, P0198 EOT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Diagnosis Procedure

INFOID:0000000003958782

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- 2. Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK ENGINE OIL TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

- 1. Disconnect engine oil temperature (EOT) sensor harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between EOT sensor harness connector and ground.

EOT sensor		Ground	Voltage (V)	
Connector	Terminal	Glound	voltage (v)	
F38	1	Ground	Approx. 5	

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

${f 3.}$ CHECK EOT SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check the continuity between EOT sensor harness connector and ECM harness connector.

EOT sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	Continuity
F38	2	F110	34	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

4. CHECK ENGINE OIL TEMPERATURE SENSOR

Refer to EC-852, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace engine oil temperature sensor.

CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000004032235

1. CHECK ENGINE OIL TEMPERATURE SENSOR

- Turn ignition switch OFF.
- Disconnect engine oil temperature sensor harness connector.
- 3. Remove engine oil temperature sensor.

P0197, P0198 EOT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Check resistance between engine oil temperature sensor terminals by heating with hot water as shown in the figure.

Terminals	Condition		Resistance (kΩ)
	Temperature [°C (°F)]	20 (68)	2.1 - 2.9
1 and 2		50 (122)	0.68 - 1.00
		90 (194)	0.236 - 0.260

JMBIA0080ZZ

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace engine oil temperature sensor.

С

D

Α

EC

Е

F

G

Н

K

L

M

Ν

0

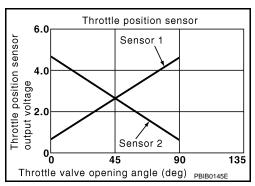
Р

P0222, P0223, P2132, P2133 TP SENSOR

Description

Electric throttle control actuator consists of throttle control motor, throttle position sensor, etc. The throttle position sensor responds to the throttle valve movement.

The throttle position sensor has two sensors. These sensors are a kind of potentiometer which transform the throttle valve position into output voltage, and emit the voltage signal to the ECM. The ECM judges the current opening angle of the throttle valve from these signals and controls the throttle valve opening angle in response to driving conditions via the throttle control motor.



DTC Logic

INFOID:0000000003958785

DTC DETECTION LOGIC

NOTE:

If DTC P0222, P0223, P2132 or P2133 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. Refer to EC-959, "DTC Logic".

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0222	Throttle position sensor 1 (bank 1) circuit low input	An excessively low voltage from the TP sensor 1 is sent to ECM.	
P0223	Throttle position sensor 1 (bank 1) circuit high input	An excessively high voltage from the TP sensor 1 is sent to ECM.	Harness or connectors (TP sensor 1 circuit is open or shorted.)
P2132	Throttle position sensor 1 (bank 2) circuit low input	An excessively low voltage from the TP sensor 1 is sent to ECM.	Electric throttle control actuator (TP sensor 1)
P2133	Throttle position sensor 1 (bank 2) circuit high input	An excessively high voltage from the TP sensor 1 is sent to ECM.	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10 V at idle.

>> GO TO 2.

2.perform dtc confirmation procedure

- Start engine and let it idle for 1 second.
- Check DTC.

Is DTC detected?

YES >> Go to EC-854, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003958786

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Revision: 2009 March EC-854 2009 FX35/FX50

P0222, P0223, P2132, P2133 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS > Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK THROTTLE POSITION SENSOR 1 POWER SUPPLY CIRCUIT-I

- Disconnect electric throttle control actuator harness connector.
- 2. Turn ignition switch ON.
- Check the voltage between electric throttle control actuator harness connector and ground.

DTC	Electric throttle control actuator			Ground	Voltage (V)
ыс	Bank	Connector	Terminal	Ground	voltage (v)
P0222, P0223	1	F66	2	Ground	Approx. 5
P2132, P2133	2	F64	2	Giodila	Αρρίολ. 3

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

3.check throttle position sensor 1 ground circuit for open and short

- Turn ignition switch OFF.
- Disconnect ECM harness connector.
- 3. Check the continuity between electric throttle control actuator harness connector and ECM harness con-

DTC	Electric throttle control actuator			ECM		Continuity
ыс	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0222, P0223	1	F66	4	F111	71	Existed
P2132, P2133	2	F64	4	1 111	72	LXISIGU

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

f 4.CHECK THROTTLE POSITION SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

Check the continuity between electric throttle control actuator harness connector and ECM harness connector.

DTC	Electric throttle control actuator			ECM		Continuity
ыс	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0222, P0223	1	F66	4	F111	73	Existed
P2132, P2133	2	F64	2	ГШ	77	EXISTEC

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

5.CHECK THROTTLE POSITION SENSOR

Refer to EC-856, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6.

Revision: 2009 March

6.REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

Replace malfunctioning electric throttle control actuator.

[VK50VE]

EC

Α

Е

F

Н

K

N

EC-855

[VK50VE]

Perform EC-582, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement"

>> INSPECTION END

7. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident"

>> INSPECTION END

Component Inspection

INFOID:0000000004032225

1. CHECK THROTTLE POSITION SENSOR

- 1. Turn ignition switch OFF.
- 2. Reconnect all harness connectors disconnected.
- 3. Perform EC-582, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement".
- 4. Turn ignition switch ON.
- 5. Set selector lever position to D.
- 6. Check the voltage between ECM harness connector terminals under the following conditions.

ECM				
Connector	+ -		Condition	Voltage (V)
Connector	Terminal	Terminal		
	73	71	Accelerator pedal: Fully released	More than 0.36
	[TP sensor 1 (bank 1)]	7 1	Accelerator pedal: Fully depressed	Less than 4.75
	77 72		Accelerator pedal: Fully released	More than 0.36
F111	[TP sensor 1 (bank 2)]	12	Accelerator pedal: Fully depressed	Less than 4.75
FIII	78 [TP sensor 2 (bank 1)] 71		Accelerator pedal: Fully released	Less than 4.75
			Accelerator pedal: Fully depressed	More than 0.36
	74 72		Accelerator pedal: Fully released	Less than 4.75
[TP sensor	[TP sensor 2 (bank 2)]	12	Accelerator pedal: Fully depressed	More than 0.36

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.replace electric throttle control actuator

- 1. Replace malfunctioning electric throttle control actuator.
- 2. Perform EC-582, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement".

>> INSPECTION END

Special Repair Requirement

INFOID:0000000004032226

${f 1}$.PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Refer to EC-582, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement"

>> GO TO 2.

2.PERFORM IDLE AIR VOLUME LEARNING

Refer to EC-583, "IDLE AIR VOLUME LEARNING: Special Repair Requirement"

>> END

P0225 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

P0225 TP SENSOR

DTC Logic

DTC DETECTION LOGIC

NOTE:

DTC P0225 is displayed with another DTC for electric throttle control actuator. Perform the trouble diagnosis for the corresponding DTC.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0225	Closed throttle position learning performance (bank 2)	Closed throttle position learning value is excessively low.	Electric throttle control actuator
F0223	Closed throttle position learning performance (bank 2)	Closed throttle position learning is not performed successfully, repeatedly.	(TP sensor 1 and 2)

EC

Α

Е

D

F

G

Н

Κ

L

M

Ν

0

Р

< DTC/CIRCUIT DIAGNOSIS >

P0300, P0301, P0302, P0303, P0304, P0305, P0306, P0307, P0308 MISFIRE

DTC Logic

DTC DETECTION LOGIC

When a misfire occurs, engine speed will fluctuate. If the engine speed fluctuates enough to cause the crank-shaft position (CKP) sensor signal to vary, ECM can determine that a misfire is occurring.

Sensor	Input signal to ECM	ECM function
Crankshaft position sensor	Engine speed	On board diagnosis of misfire

The misfire detection logic consists of the following two conditions.

1. One Trip Detection Logic (Three Way Catalyst Damage)

On the 1st trip that a misfire condition occurs that can damage the three way catalyst (TWC) due to overheating, the MIL will blink.

When a misfire condition occurs, the ECM monitors the CKP sensor signal every 200 engine revolutions for a change.

When the misfire condition decreases to a level that will not damage the TWC, the MIL will turn off.

If another misfire condition occurs that can damage the TWC on a second trip, the MIL will blink.

When the misfire condition decreases to a level that will not damage the TWC, the MIL will remain on.

If another misfire condition occurs that can damage the TWC, the MIL will begin to blink again.

2. Two Trip Detection Logic (Exhaust quality deterioration)

For misfire conditions that will not damage the TWC (but will affect vehicle emissions), the MIL will only light when the misfire is detected on a second trip. During this condition, the ECM monitors the CKP sensor signal every 1,000 engine revolutions.

A misfire malfunction can be detected in any one cylinder or in multiple cylinders.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	
P0300	Multiple cylinder misfires detected	Multiple cylinders misfire.		
P0301	No.1 cylinder misfire detected	No. 1 cylinder misfires.	Improper spark plug Insufficient compression	
P0302	No. 2 cylinder misfire detected	No. 2 cylinder misfires.	Incorrect fuel pressure	
P0303	No. 3 cylinder misfire detected	No. 3 cylinder misfires.	The fuel injector circuit is open or shorted Fuel injector	
P0304	No. 4 cylinder misfire detected	No. 4 cylinder misfires.	Intake air leakage	
P0305	No. 5 cylinder misfire detected	No. 5 cylinder misfires.	The ignition signal circuit is open or shorted Lack of fuel	
P0306	No. 6 cylinder misfire detected	No. 6 cylinder misfires.	Signal plate	
P0307	No. 7 cylinder misfire detected	No. 7 cylinder misfires.	A/F sensor 1 Incorrect PCV hose connection	
P0308	No. 8 cylinder misfire detected	No. 8 cylinder misfires.	- mooned i ov nose connection	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE-I

- 1. Start engine and warm it up to normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Turn ignition switch ON.
- 4. Turn ignition switch OFF and wait at least 10 seconds.

< DTC/CIRCUIT DIAGNOSIS >

Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-859, "Diagnosis Procedure".

NO >> GO TO 3.

3.perform dtc confirmation procedure-ii

1. Turn ignition switch OFF and wait at least 10 seconds.

Restart engine and let it idle for about 15 minutes.

- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.
- 4. Start engine and drive the vehicle under similar conditions to (1st trip) Freeze Frame Data for a certain time. Refer to the table below.

Hold the accelerator pedal as steady as possible.

Similar conditions to (1st trip) Freeze Frame Data mean that the following conditions should be satisfied at

CAUTION:

Always drive vehicle in safe manner according to traffic conditions and obey all traffic laws when driving.

Engine speed	Engine speed in the freeze frame data $\pm400~\text{rpm}$		
Vehicle speed	Vehicle speed in the freeze frame data \pm 10 km/h (6 MPH)		
Base fuel schedule	Base fuel schedule in the freeze frame data \times (1 \pm 0.1)		
Engine coolant temperature (T)	When the freeze frame data shows lower than 70°C (158°F), T should be lower than 70°C (158°F).		
condition	When the freeze frame data shows higher than or equal to 70°C (158°F), T should be higher than or equal to 70°C (158°F).		

Driving time varies according to the engine speed in the freeze frame data.

Engine speed	Time
Around 1,000 rpm	Approximately 10 minutes
Around 2,000 rpm	Approximately 5 minutes
More than 3,000 rpm	Approximately 3.5 minutes

Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-859, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1. CHECK FOR INTAKE AIR LEAKAGE AND PCV HOSE

- Start engine and run it at idle speed.
- Listen for the sound of the intake air leakage. 2.
- Check PCV hose connection.

Is intake air leakage detected?

YES >> Discover air leakage location and repair.

NO >> GO TO 2.

2.CHECK FOR EXHAUST SYSTEM CLOGGING

Stop engine and visually check exhaust tube, three way catalyst and muffler for dents.

Is the inspection result normal?

YES-1 >> With CONSULT-III: GO TO 3.

YES-2 >> Without CONSULT-III: GO TO 4.

>> Repair or replace malfunctioning part. NO

$oldsymbol{3}.$ PERFORM POWER BALANCE TEST

EC-859 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

F

Н

INFOID:0000000004045078

Ν

< DTC/CIRCUIT DIAGNOSIS >

- (II) With CONSULT-III
- Start engine.
- Perform "POWER BALANCE" in "ACTIVE TEST" mode with CONSULT-III.
- Check that each circuit produces a momentary engine speed drop.

Is the inspection result normal?

YES >> GO TO 9. NO >> GO TO 4.

4. CHECK FUNCTION OF FUEL INJECTOR-I

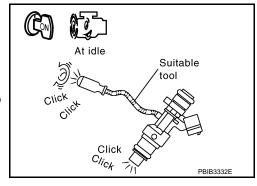
- Start engine and let it idle.
- Listen to each fuel injector operation.

Clicking sound should be heard.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Perform trouble diagnosis for FUEL INJECTOR, refer to EC-1096, "Diagnosis Procedure".



0

0

0

5.CHECK FUNCTION OF IGNITION COIL-I

CAUTION:

Perform the following procedure in a place with no combustible objects and good ventilation.

- 1. Turn ignition switch OFF.
- 2. Remove fuel pump fuse (1) in IPDM E/R (2) to release fuel pressure.

NOTE:

Do not use CONSULT-III to release fuel pressure, or fuel pressure applies again during the following procedure.

- 3. Start engine.
- 4. After engine stalls, crank it 2 or 3 times to release all fuel pres-
- 5. Turn ignition switch OFF.
- 6. Remove all ignition coil harness connectors to avoid the electrical discharge from the ignition coils.
- 7. Remove ignition coil and spark plug of the cylinder to be checked.
- 8. Crank engine for 5 seconds or more to remove combustion gas in the cylinder.
- 9. Connect spark plug and harness connector to ignition coil.
- 10. Fix ignition coil using a rope etc. with gap of 13 17 mm (0.52 -0.66 in) between the edge of the spark plug and grounded metal portion as shown in the figure.
- 11. Crank engine for approximately 3 seconds, and check whether spark is generated between the spark plug and the grounded metal portion.

13 - 17 mm ากกกก้ากกก้ำ (0.52-0.66 in) Grounded metal portion (Cylinder head, cylinder block, etc.)

JMBIA1552ZZ

Spark should be generated.

CAUTION:

- Never place the spark plug and the ignition coil within 50 cm (19.7 in) each other. Be careful not to get an electrical shock while checking, because the electrical discharge voltage becomes 20 kV or more.
- It might damage the ignition coil if the gap of more than 17 mm (0.66 in) is made.

When the gap is less than 13 mm (0.52 in), a spark might be generated even if the coil is malfunctioning.

Is the inspection result normal?

< DTC/CIRCUIT DIAGNOSIS >

YES >> GO TO 9. NO >> GO TO 6.

6.CHECK FUNCTION OF IGNITION COIL-II

- Turn ignition switch OFF.
- Disconnect spark plug and connect a non-malfunctioning spark plug. 2.
- Crank engine for approximately 3 seconds, and recheck whether spark is generated between the spark plug and the grounded metal portion.

Spark should be generated.

Is the inspection result normal?

YES >> GO TO 7.

>> Check ignition coil, power transistor and their circuits. Refer to EC-1107, "Diagnosis Procedure". NO

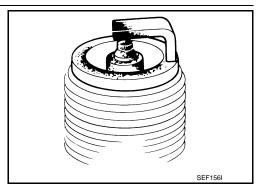
.CHECK SPARK PLUG

Check the initial spark plug for fouling, etc.

Is the inspection result normal?

YES >> Replace spark plug(s) with standard type one(s). For spark plug type, refer to EM-282, "Spark Plug".

NO >> Repair or clean spark plug. Then GO TO 8.



8.CHECK FUNCTION OF IGNITION COIL-III

- Reconnect the initial spark plugs.
- Crank engine for approximately 3 seconds, and recheck whether spark is generated between the spark plug and the grounded portion.

Spark should be generated.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace spark plug(s) with standard type one(s). For spark plug type, refer to EM-282, "Spark Plug".

9. CHECK COMPRESSION PRESSURE

Check compression pressure. Refer to EM-173, "Inspection".

Is the inspection result normal?

YES >> GO TO 10.

NO >> Check pistons, piston rings, valves, valve seats and cylinder head gaskets.

10.CHECK FUEL PRESSURE

- Install all removed parts.
- Check fuel pressure. Refer to EC-1228, "Inspection".

Is the inspection result normal?

YES >> GO TO 12.

NO >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check fuel hoses and fuel tubes for clogging.

Is the inspection result normal?

YES >> Replace "fuel filter and fuel pump assembly".

NO >> Repair or replace malfunctioning part.

12.CHECK IDLE SPEED AND IGNITION TIMING

EC-861 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

Н

K

Ν

< DTC/CIRCUIT DIAGNOSIS >

Check idle speed and ignition timing.

For procedure, refer to EC-577, "BASIC INSPECTION: Special Repair Requirement".

For specification, refer to EC-1233, "Idle Speed" and EC-1233, "Ignition Timing".

Is the inspection result normal?

YES >> GO TO 13.

NO >> Follow the EC-577, "BASIC INSPECTION: Special Repair Requirement".

13.CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT

- Turn ignition switch OFF.
- Disconnect corresponding A/F sensor 1 harness connector.
- Disconnect ECM harness connector.
- Check the continuity between A/F sensor 1 harness connector and ECM harness connector.

A/F sensor 1		EC	Continuity		
Bank	Connector	Terminal	Connector	Terminal	Continuity
1	F67	1		81	
ı	107	2	F111	82	Existed
2	EGO	1	ГП	85	Existed
2	F68	2		86	

Check the continuity between A/F sensor 1 harness connector and ground, or ECM harness connector and ground.

	A/F sensor	1	ECM		Ground	Continuity
Bank	Connector	Terminal	Connector	Terminal	Ground	Continuity
1	F67	1		81		
ı	107	2	F111	82	Ground	Not existed
2	F68	1	1 111	85	Ground	NOT EXISTED
2	1 00	2		86		

Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 14.

>> Repair open circuit, short to ground or short to power in harness or connectors. NO

14.CHECK A/F SENSOR 1 HEATER

Refer to EC-758, "Component Inspection".

Is the inspection result normal?

>> GO TO 15. YES

NO >> Replace malfunctioning A/F sensor 1.

15. CHECK MASS AIR FLOW SENSOR

(P) With CONSULT-III

Check mass air flow sensor signal in "DATA MONITOR" mode with CONSULT-III.

For specification, refer to EC-1233, "Mass Air Flow Sensor".

With GST

Check mass air flow sensor signal in Service \$01 with GST.

For specification, refer to EC-1233, "Mass Air Flow Sensor".

Is the measurement value within the specification?

YES >> GO TO 16.

>> Check connectors for rusted terminals or loose connections in the mass air flow sensor circuit or ground. Refer to EC-776, "Diagnosis Procedure".

16. CHECK SYMPTOM MATRIX CHART

Check items on the rough idle symptom in EC-1215, "Symptom Table".

EC-862 Revision: 2009 March 2009 FX35/FX50

P0300, P0301, P0302, P0303, P0304, P0305, P0306, P0307, P0308 MISFIRE < DTC/CIRCUIT DIAGNOSIS > [VK50V]	F1
12.10/01/02/12/1/01/02/02	_1
Is the inspection result normal? YES >> GO TO 17.	А
NO >> Repair or replace malfunctioning part.	, ,
17. ERASE THE 1ST TRIP DTC	
Some tests may cause a 1st trip DTC to be set.	— EC
Erase the 1st trip DTC from the ECM memory after performing the tests. Refer to EC-706, "Diagnosis Descr	p-
<u>tion"</u> .	С
>> GO TO 18.	
18.check intermittent incident	D
Refer to GI-35, "Intermittent Incident".	_
>> INSPECTION END	Е
	F
	G
	0
	Н
	J
	K
	L

EC-863 Revision: 2009 March 2009 FX35/FX50

Ν

0

Ρ

[VK50VE]

P0327, P0328, P0332, P0333 KS

Description

The knock sensor is attached to the cylinder block. It senses engine knocking using a piezoelectric element. A knocking vibration from the cylinder block is sensed as vibrational pressure. This pressure is converted into a voltage signal and sent to the ECM.

DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detected condition	Possible cause
P0327	Knock sensor (bank 1) circuit low input	An excessively low voltage from the sensor is sent to ECM.	
P0328	Knock sensor (bank 1) circuit high input	An excessively high voltage from the sensor is sent to ECM.	Harness or connectors (The sensor circuit is open or shorted.)
P0332	Knock sensor (bank 2) circuit low input	An excessively low voltage from the sensor is sent to ECM.	Knock sensor
P0333	Knock sensor (bank 2) circuit high input	An excessively high voltage from the sensor is sent to ECM.	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10 V at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine and run it for at least 5 seconds at idle speed.
- 2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-864, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003958793

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38. "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2. CHECK KNOCK SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- Disconnect knock sensor harness connector and ECM harness connector.
- Check the continuity between knock sensor harness connector and ECM harness connector.

[VK50VE]

DTC		Knock sens	nsor		CM	Continuity
ыс	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0327, P0328	1	F212	2	F110	35	Existed
P0332, P0333	2	F213	2	1110	33	LXISIEU

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3. 3.DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F49, F211
- Harness for open or short between knock sensor and ECM

>> Repair open circuit or short to power in harness or connectors.

4. CHECK KNOCK SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between knock sensor harness connector and ECM harness connector.

DTC	Knock sensor		EC	Continuity		
ыс	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0327, P0328	1	F212	1	F110	40	Existed
P0332, P0333	2	F213	1	FIIU	44	EXISTEC

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 5.

${f 5.}$ DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F49, F211
- Harness for open or short between ECM and knock sensor

>> Repair open circuit, short to ground or short to power in harness or connectors.

6. CHECK KNOCK SENSOR

Refer to EC-865, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 7.

>> Replace malfunctioning knock sensor.

.CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

1.CHECK KNOCK SENSOR

- Turn ignition switch OFF.
- Disconnect knock sensor harness connector.
- Check resistance between knock sensor terminals as per the following. NOTE:

EC-865 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

F

N

INFOID:0000000003958794

It is necessary to use an ohmmeter which can measure more than 10 M Ω .

Terminals	Resistance
1 and 2	Approx. 532 - 588 kΩ [at 20°C (68°F)]

CAUTION:

Never use any knock sensors that have been dropped or physically damaged. Use only new ones. <u>Is the inspection result normal?</u>

YES >> INSPECTION END

NO >> Replace malfunctioning knock sensor.

[VK50VE]

Α

EC

D

F

Н

P0335 CKP SENSOR

Description

The crankshaft position sensor is located on the cylinder block facing the gear teeth (cogs) of the signal plate. It detects the fluctuation of the engine revolution.

The sensor consists of a permanent magnet and Hall IC.

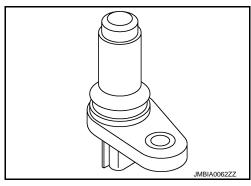
When the engine is running, the high and low parts of the teeth cause the gap with the sensor to change.

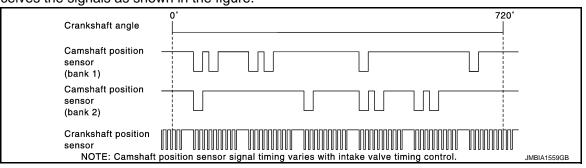
The changing gap causes the magnetic field near the sensor to change.

Due to the changing magnetic field, the voltage from the sensor changes.

The ECM receives the voltage signal and detects the fluctuation of the engine revolution.

ECM receives the signals as shown in the figure.





DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0335	Crankshaft position sensor circuit	 The crankshaft position sensor signal is not detected by the ECM during the first few seconds of engine cranking. The proper pulse signal from the crankshaft position sensor is not sent to ECM while the engine is running. The crankshaft position sensor signal is not in the normal pattern during engine running. 	Harness or connectors (Crankshaft position sensor circuit is open or shorted.) (Accelerator pedal position sensor 2 circuit is shorted.) (Battery current sensor circuit is shorted.) [Camshaft position sensor (bank 1) circuit is shorted.] (EVAP control system pressure sensor circuit is shorted.) [Exhaust valve timing control position sensor (bank 1) circuit is shorted.] (Manifold pressure sensor circuit is shorted.) Crankshaft position sensor Accelerator pedal position sensor Battery current sensor Camshaft position sensor (bank 1) EVAP control system pressure sensor Exhaust valve timing control position sensor (bank 1) Manifold pressure sensor Signal plate

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

Turn ignition switch OFF and wait at least 10 seconds.

Revision: 2009 March EC-867 2009 FX35/FX50

[VK50VE]

< DTC/CIRCUIT DIAGNOSIS >

- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10.5 V with ignition switch ON.

>> GO TO 2.

2.perform dtc confirmation procedure

1. Start engine and let it idle for at least 5 seconds.

If engine does not start, crank engine for at least 2 seconds.

2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-868, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003958797

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- 2. Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK CRANKSHAFT POSITION SENSOR POWER SUPPLY CIRCUIT-I

- 1. Disconnect crankshaft position (CKP) sensor harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between CKP sensor harness connector and ground.

CKP :	sensor	Ground	Voltage (V)
Connector	Terminal	Ground	voltage (v)
F2	1	Ground	Approx. 5

Is the inspection result normal?

YES >> GO TO 8.

NO >> GO TO 3.

3.check ckp sensor power supply circuit-ii $\,$

- Turn ignition switch ON.
- 2. Disconnect ECM harness connector.
- 3. Check the continuity between CKP sensor harness connector and ECM harness connector.

CKP s	CKP sensor		ECM		
Connector	Terminal	Connector Terminal		Continuity	
F2	1	F111	87	Existed	

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit.

4. CHECK SENSOR POWER SUPPLY CIRCUIT

Check harness for short to power and short to ground, between the following terminals.

EC	M	Sensor		•
Connector	Terminal	Name	Connector	Terminal
	87	CKP sensor	F2	1
24		Camshaft position sensor (bank 1)	F84	1
E444	91	EVT control position sensor (bank 1)	F59	1
F111	95	Battery current sensor	E21	1
		EVAP control system pressure sensor	B252	3
		Manifold pressure sensor	F65	3
M160 99		APP sensor 2 (Without ICC)	E112	6
		APP sensor 2 (With ICC)	E116	3
s the inspe	ection resu	ult normal?		
	> GO TO : > Repair s	5. hort to ground or short to power in	harness or	connecto

5. CHECK COMPONENTS

Check the following.

- Battery current sensor (Refer to <u>EC-1019</u>, "Component Inspection".)
- Camshaft position sensor (bank 1) (Refer to <u>EC-875, "Component Inspection"</u>.)
- EVAP control system pressure sensor (Refer to EC-911, "Component Inspection".)
- Exhaust valve timing control position sensor (bank 1) (Refer to <u>EC-972, "Component Inspection"</u>.)
- Manifold pressure sensor (Refer to <u>EC-1115</u>, "Component Inspection".)

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace malfunctioning component.

6.CHECK APP SENSOR

Refer to EC-1074, "Component Inspection".

Is the inspection result normal?

>> GO TO 12. YES

NO >> GO TO 7.

7.REPLACE ACCELERATOR PEDAL ASSEMBLY

- Replace accelerator pedal assembly.
- Perform EC-1075, "Special Repair Requirement".

>> INSPECTION END

8.CHECK CKP SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check the continuity between CKP sensor harness connector and ECM harness connector.

Continuity	ECM		CKP sensor	
Continuity	Connector Terminal		Terminal	Connector
Existed	68	F111	2	F2

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

9.CHECK CKP SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

Check the continuity between CKP sensor harness connector and ECM harness connector.

EC-869 Revision: 2009 March 2009 FX35/FX50

EC

Α

Е

F

M

N

< DTC/CIRCUIT DIAGNOSIS >

CKP s	CKP sensor ECM			Continuity
Connector	Terminal	Connector Terminal		Continuity
F2	3	F111	67	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

10. CHECK CRANKSHAFT POSITION SENSOR

Refer to EC-870, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 11.

NO >> Replace crankshaft position sensor.

11. CHECK GEAR TOOTH

Visually check for chipping signal plate gear tooth.

Is the inspection result normal?

YES >> GO TO 12.

NO >> Replace the signal plate.

12. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000003958798

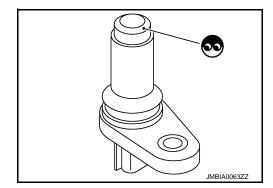
1. CHECK CRANKSHAFT POSITION SENSOR-I

- 1. Turn ignition switch OFF.
- 2. Loosen the fixing bolt of the sensor.
- 3. Disconnect crankshaft position sensor harness connector.
- 4. Remove the sensor.
- 5. Visually check the sensor for chipping.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace crankshaft position sensor.



2. CHECK CRANKSHAFT POSITION SENSOR-II

Check resistance between crankshaft position sensor terminals as per the following.

Terminals (Polarity)	Resistance
1 (+) - 2 (-)	
1 (+) - 3 (-)	Except 0 or ∞ Ω [at 25°C (77°F)]
2 (+) - 3 (-)	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace crankshaft position sensor.

Α

EC

D

Е

F

Н

P0340, P0345 CMP SENSOR

Description INFOID:000000003958799

The camshaft position sensor senses the protrution of the signal plate installed to the camshaft (INT) front end to identify a particular cylinder. The camshaft position sensor senses the piston position.

When the crankshaft position sensor system becomes inoperative, the camshaft position sensor provides various controls of engine parts instead, utilizing timing of cylinder identification signals.

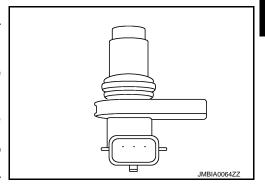
The sensor consists of a permanent magnet and Hall IC.

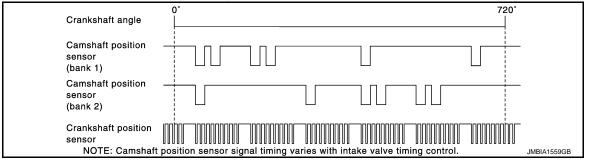
When engine is running, the high and low parts of the teeth cause the gap with the sensor to change.

The changing gap causes the magnetic field near the sensor to change.

Due to the changing magnetic field, the voltage from the sensor changes.

ECM receives the signals as shown in the figure.





DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P0345 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. Refer to EC-959, "DTC Logic".

J

K

N /I

Ν

0

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0340	Camshaft position sensor (bank 1) circuit	 The cylinder No. signal is not sent to ECM for the first few seconds during engine cranking. The cylinder No. signal is not sent to ECM during engine running. The cylinder No. signal is not in the normal pattern during engine running. 	Harness or connectors [Camshaft position sensor (bank 1) circuit is open or shorted.] (APP sensor 2 circuit is shorted.) (Battery current sensor circuit is shorted.) [Crankshaft position sensor circuit is shorted.] (EVAP control system pressure sensor circuit is shorted.) [Exhaust valve timing control position sensor (bank 1) circuit is shorted.] (Manifold pressure sensor circuit is shorted.) Camshaft position sensor (bank 1) Accelerator pedal position sensor Battery current sensor Crankshaft position sensor EVAP control system pressure sensor Evhaust valve timing control position sensor (bank 1) Manifold pressure sensor Camshaft (INT) Starter motor Starting system circuit Dead (Weak) battery
P0345	Camshaft position sensor (bank 2) circuit		Harness or connectors [Camshaft position sensor (bank 2) circuit is open or shorted.] Camshaft position sensor (bank 2) Camshaft (INT) Starter motor Starting system circuit Dead (Weak) battery

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10.5 V with ignition switch ON.

>> GO TO 2.

2.perform dtc confirmation procedure-i

- Start engine and let it idle for at least 5 seconds.
 If engine does not start, crank engine for at least 2 seconds.
- 2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-873, "Diagnosis Procedure".

NO >> GO TO 3.

3.perform dtc confirmation procedure-i

- Maintain engine speed at more than 800 rpm for at least 5 seconds.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-873, "Diagnosis Procedure".

P0340, P0345 CMP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003958801

1. CHECK STARTING SYSTEM

Turn ignition switch to START position.

Does the engine turn over? Does the starter motor operate?

YES >> GO TO 2.

NO >> Check starting system. (Refer to <u>STR-2, "Work Flow"</u>.)

2.CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- 2. Check ground connections M95, F33 and F34. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace ground connection.

3.check camshaft position sensor power supply circuit-i

- 1. Disconnect camshaft position (CMP) sensor harness connector.
- Turn ignition switch ON.
- Check the voltage between CMP sensor harness connector and ground.

DTC		CMP sens	MP sensor		Voltage (V)
DIC	Bank	Connector	Terminal	Ground	voltage (v)
P0340	1	F84	1	Ground	Approx. 5
P0345	2	F83	1	Glound	дриох. 3

Is the inspection result normal?

YES >> GO TO 9.

NO-1 >> P0340: GO TO 4.

NO-2 >> P0345: Repair open circuit, short to ground or short to power in harness or connectors.

4. CHECK CMP SENSOR POWER SUPPLY CIRCUIT-II

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check the continuity between CMP sensor harness connector and ECM harness connector.

CMP sensor			EC	CM	Continuity
Bank	Connector	Terminal	Connector	Terminal	Continuity
1	F84	1	F111	91	Existed

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit.

5. CHECK SENSOR POWER SUPPLY CIRCUIT

Check harness for short to power and short to ground, between the following terminals.

EC

Α

Е

D

F

G

K

N

ECM		Sensor				
Connector	Terminal	Name	Connector	Terminal		
	87	Crankshaft position sensor	F2	1		
	91	CMP sensor (bank 1)	F84	1		
F111	91	EVT control position sensor (bank 1)	F59	1		
		Battery current sensor	E21	1		
	95	EVAP control system pressure sensor	B252	3		
		Manifold pressure sensor	F65	1		
M160	00	APP sensor 2 (Without ICC)	E112	6		
M160 99		APP sensor 2 (With ICC)	E116	3		

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair short to ground or short to power in harness or connectors.

6. CHECK COMPONENTS

Check the following.

- Battery current sensor (Refer to EC-1019, "Component Inspection".)
- Crankshaft position sensor (Refer to <u>EC-870, "Component Inspection"</u>.)
- EVAP control system pressure sensor (Refer to <a>EC-911, <a>"Component Inspection".)
- Exhaust valve timing control position sensor (bank 1) (Refer to EC-972, "Component Inspection".)
- Manifold pressure sensor (Refer to <u>EC-1115, "Component Inspection"</u>.)

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace malfunctioning component.

7. CHECK APP SENSOR

Refer to EC-1074, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 13. NO >> GO TO 8.

8. REPLACE ACCELERATOR PEDAL ASSEMBLY

- Replace accelerator pedal assembly.
- 2. Perform EC-1075, "Special Repair Requirement".

>> INSPECTION END

9.check cmp sensor ground circuit for open and short

- 1. Turn ignition switch OFF.
- Disconnect ECM harness connector.
- Check the continuity between CMP sensor harness connector and ECM harness connector.

DTC		CMP sense	or	EC	CM	Continuity
ыс	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0340	1	F84	2	F111	58	Existed
P0345	2	F83	2	1 111	62	LXISIGU

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

10.CHECK CMP SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

< DTC/CIRCUIT DIAGNOSIS >

Check the continuity between CMP sensor harness connector and ECM harness connector.

DTC		CMP sense	or	ECM		Continuity
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0340	1	F84	3	F111	59	Existed
P0345	2	F83	3	1 111	63	LAISIEU

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

11. CHECK CAMSHAFT POSITION SENSOR

Refer to EC-875, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 12.

NO >> Replace malfunctioning camshaft position sensor.

12. CHECK CAMSHAFT (INT)

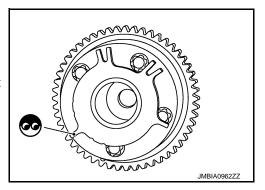
Check the following.

- Accumulation of debris to the signal plate of camshaft front end
- · Chipping signal plate of camshaft front end

Is the inspection result normal?

YES >> GO TO 13.

>> Remove debris and clean the signal plate of camshaft NO front end or replace camshaft.



13. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

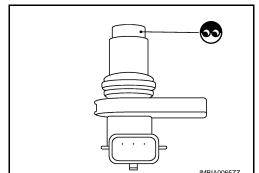
1. CHECK CAMSHAFT POSITION SENSOR-I

- Turn ignition switch OFF.
- 2. Loosen the fixing bolt of the sensor.
- 3. Disconnect camshaft position sensor harness connector.
- Remove the sensor.
- 5. Visually check the sensor for chipping.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace malfunctioning camshaft position sensor.



2.CHECK CAMSHAFT POSITION SENSOR-II $\,$

Check resistance camshaft position sensor terminals as per the following.

EC-875 Revision: 2009 March 2009 FX35/FX50

EC

[VK50VE]

Α

Е

INFOID:0000000003958802

N

P0340, P0345 CMP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Terminals (Polarity)	Resistance
1 (+) - 2 (-)	
1 (+) - 3 (-)	Except 0 or ∞ Ω [at 25°C (77°F)]
2 (+) - 3 (-)	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace malfunctioning camshaft position sensor.

[VK50VE]

P0420, P0430 THREE WAY CATALYST FUNCTION

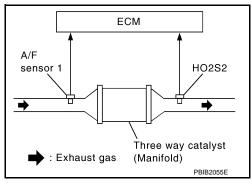
DTC Logic INFOID:0000000003958803

DTC DETECTION LOGIC

The ECM monitors the switching frequency ratio of air fuel ratio (A/F) sensor 1 and heated oxygen sensor 2.

A three way catalyst (manifold) with high oxygen storage capacity will indicate a low switching frequency of heated oxygen sensor 2. As oxygen storage capacity decreases, the heated oxygen sensor 2 switching frequency will increase.

When the frequency ratio of A/F sensor 1 and heated oxygen sensor 2 approaches a specified limit value, the three way catalyst (manifold) malfunction is diagnosed.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0420	Catalyst system efficiency below threshold (bank 1)	Three way catalyst (manifold) does not	Three way catalyst (manifold) Exhaust tube
P0430	Catalyst system efficiency below threshold (bank 2)	operate properly. Three way catalyst (manifold) does not have enough oxygen storage capacity.	 Intake air leakage Fuel injector Fuel injector leakage Spark plug Improper ignition timing

DTC CONFIRMATION PROCEDURE

1.INSPECTION START

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

Will CONSULT-III be used?

YFS >> GO TO 2. NO >> GO TO 6.

2.PERFORM DTC CONFIRMATION PROCEDURE-I

(P) With CONSULT-III

TESTING CONDITION:

Do not maintain engine speed for more than the specified minutes below.

- Start engine and warm it up to the normal operating temperature.
- Turn ignition switch OFF and wait at least 10 seconds. 2.
- 3. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.
- Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- Let engine idle for 1 minute.
- Select "DATA MONITOR" mode with CONSULT-III.
- Check that "COOLAN TEMP/S" indicates more than 70°C (158°F). If not, warm up engine and go to next step when "COOLAN TEMP/S" indication reaches to 70°C (158°F).
- Open engine hood.
- Select "DTC & SRT CONFIRMATION" then "SRT WORK SUPPORT" mode with CONSULT-III.
- 11. Rev engine between 2,000 and 3,000 rpm and hold it for 3 consecutive minutes then release the accelerator pedal completely.
- 12. Check the indication of "CATALYST".

Which is displayed on CONSULT-III screen?

CMPLT>> GO TO 5.

EC-877 Revision: 2009 March 2009 FX35/FX50

D

Α

EC

Е

Н

K

M

N

P0420, P0430 THREE WAY CATALYST FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

INCMP >> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE-II

- Wait 5 seconds at idle.
- Rev engine between 2,000 and 3,000 rpm and maintain it until "INCMP" of "CATALYST" changes to "CMPLT" (It will take approximately 5 minutes).

Does the indication change to "CMPLT"?

YES >> GO TO 5.

NO >> GO TO 4.

f 4.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

- Stop engine and cool it down to less than 70°C (158°F).
- Perform DTC CONFIRMATION PROCEDURE again.

>> GO TO 2.

5.perform dtc confirmation procedure-iii

Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-879, "Diagnosis Procedure".

NO >> INSPECTION END

6.PERFORM COMPONENT FUNCTION CHECK

With GST

Perform component function check. Refer to EC-878, "Component Function Check".

NOTE:

Use component function check to check the overall function of the three way catalyst (manifold). During this check, a 1st trip DTC might not be confirmed.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-879, "Diagnosis Procedure"

Component Function Check

INFOID:0000000003958804

1. PERFORM COMPONENT FUNCTION CHECK

With GST

- 1. Start engine and warm it up to the normal operating temperature.
- Turn ignition switch OFF and wait at least 10 seconds.
- 3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- 4. Let engine idle for 1 minute.
- Open engine hood.
- Check the voltage between ECM harness connector terminals under the following conditions.

	ECM				
DTC	Connector	+	_	Condition	Voltage
	Connector	Terminal	Terminal		
P0420	F110	32 [HO2S2 (bank 1)]		Keeping engine speed at 2,500 rpm	The voltage fluctuation cycle takes more than 5 seconds.
P0430	1110	36 [HO2S2 (bank 2)]		constant under no load	• 1 cycle: 0.6 - 1.0 → 0 - 0.3 → 0.6 - 1.0

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-879, "Diagnosis Procedure".

P0420, P0430 THREE WAY CATALYST FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Diagnosis Procedure

INFOID:0000000003958805

CHECK EXHAUST SYSTEM

Visually check exhaust tubes and muffler for dents.

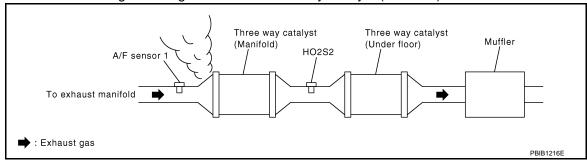
Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace malfunctioning part.

2.CHECK EXHAUST GAS LEAKAGE

- Start engine and run it at idle.
- Listen for an exhaust gas leakage before the three way catalyst (manifold).



Is exhaust gas leakage detected?

YES >> Repair or replace malfunctioning part.

NO >> GO TO 3.

3.CHECK INTAKE AIR LEAKAGE

Listen for an intake air leakage after the mass air flow sensor.

Is intake air leakage detected?

YES >> Repair or replace malfunctioning part.

NO >> GO TO 4.

4. CHECK IDLE SPEED AND IGNITION TIMING

Check idle speed and ignition timing.

For procedure, refer to EC-577, "BASIC INSPECTION: Special Repair Requirement".

For specification, refer to EC-1233, "Idle Speed" and EC-1233, "Ignition Timing".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Follow the EC-577, "BASIC INSPECTION: Special Repair Requirement".

CHECK FUEL INJECTORS

- Stop engine and then turn ignition switch ON.
- Check the voltage between ECM harness connector terminals as per the following.

	E	CM			
	+	-		Voltage	
Connector	Terminal	Connector	Terminal		
	17				
	21	- M160	128		
	25				
F110	29			Potton voltogo	
FIIU	33			Battery voltage	
	37				
	41				
	45				

EC-879 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

F

Н

Ν

< DTC/CIRCUIT DIAGNOSIS > Is the inspection result normal?

YES >> GO TO 6.

NO >> Perform <u>EC-1096</u>, "Diagnosis Procedure".

6. CHECK FUNCTION OF IGNITION COIL-I

CAUTION:

Perform the following procedure in a place with no combustible objects and good ventilation.

- Turn ignition switch OFF.
- Remove fuel pump fuse (1) in IPDM E/R (2) to release fuel pressure.

NOTE:

Do not use CONSULT-III to release fuel pressure, or fuel pressure applies again during the following procedure.

- Start engine. 3.
- After engine stalls, crank it 2 or 3 times to release all fuel pressure.
- 5. Turn ignition switch OFF.
- Remove all ignition coil harness connectors to avoid the electrical discharge from the ignition coils.
- 7. Remove ignition coil and spark plug of the cylinder to be checked.
- 8. Crank engine for 5 seconds or more to remove combustion gas in the cylinder.
- 9. Connect spark plug and harness connector to ignition coil.
- 10. Fix ignition coil using a rope etc. with gap of 13 17 mm (0.52 -0.66 in) between the edge of the spark plug and grounded metal portion as shown in the figure.
- 11. Crank engine for approximately 3 seconds, and check whether spark is generated between the spark plug and the grounded metal portion.



CAUTION:

- Never place the spark plug and the ignition coil within 50 cm (19.7 in) each other. Be careful not to get an electrical shock while checking, because the electrical discharge voltage becomes 20 kV or more.
- It might damage the ignition coil if the gap of more than 17 mm (0.66 in) is made.

When the gap is less than 13 mm (0.52 in), a spark might be generated even if the coil is malfunctioning.

Is the inspection result normal?

YFS >> GO TO 10. NO >> GO TO 7.

.CHECK FUNCTION OF IGNITION COIL-II

- Turn ignition switch OFF.
- Disconnect spark plug and connect a non-malfunctioning spark plug.
- Crank engine for approximately 3 seconds, and recheck whether spark is generated between the spark plug and the grounded metal portion.

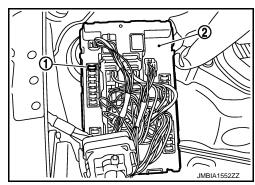
Spark should be generated.

Is the inspection result normal?

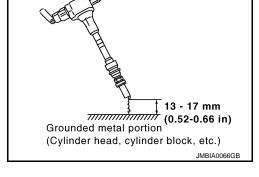
YES >> GO TO 8.

NO >> Check ignition coil, power transistor and their circuits. Refer to EC-1107, "Diagnosis Procedure".

8.CHECK SPARK PLUG



[VK50VE]



P0420, P0430 THREE WAY CATALYST FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

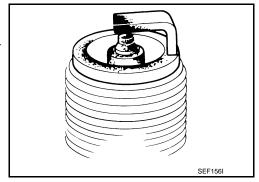
[VK50VE]

Check the initial spark plug for fouling, etc.

Is the inspection result normal?

YES >> Replace spark plug(s) with standard type one(s). For spark plug type, refer to EM-282, "Spark Plug".

NO >> Repair or clean spark plug. Then GO TO 9.



9. CHECK FUNCTION OF IGNITION COIL-III

- Reconnect the initial spark plugs.
- 2. Crank engine for approximately 3 seconds, and recheck whether spark is generated between the spark plug and the grounded portion.

Spark should be generated.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace spark plug(s) with standard type one(s). For spark plug type, refer to EM-282, "Spark Plua".

10. CHECK FUEL INJECTOR

- Turn ignition switch OFF.
- Remove fuel injector assembly.

Refer to EM-182, "Removal and Installation".

Keep fuel hose and all fuel injectors connected to fuel tube.

- 3. Disconnect all ignition coil harness connectors.
- 4. Reconnect all fuel injector harness connectors disconnected.
- 5. Turn ignition switch ON.
- 6. Check that fuel does not drip from fuel injector.

Does fuel drip from fuel injector?

YES >> Replace the fuel injector(s) from which fuel is dripping.

NO >> GO TO 11.

11. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace three way catalyst assembly.

NO >> Repair or replace harness or connector. EC

Α

D

F

Н

Ν

DTC Logic

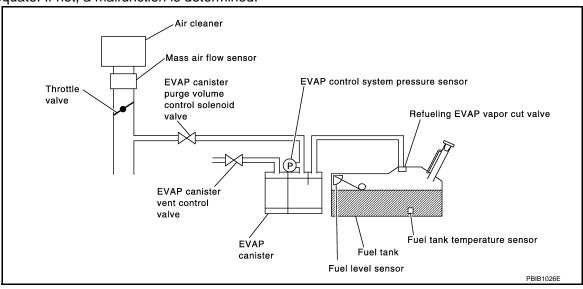
DTC DETECTION LOGIC

NOTE:

If DTC P0441 is displayed with other DTC such as P2122, P2123, P2127, P2128 or P2138, first perform trouble diagnosis for other DTC.

In this evaporative emission (EVAP) control system, purge flow occurs during non-closed throttle conditions. Purge volume is related to air intake volume. Under normal purge conditions (non-closed throttle), the EVAP canister purge volume control solenoid valve is open to admit purge flow. Purge flow exposes the EVAP control system pressure sensor to intake manifold vacuum.

Under normal conditions (non-closed throttle), sensor output voltage indicates if pressure drop and purge flow are adequate. If not, a malfunction is determined.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0441	EVAP control system incorrect purge flow	EVAP control system does not operate properly, EVAP control system has a leak between intake manifold and EVAP control system pressure sensor.	EVAP canister purge volume control solenoid valve stuck closed EVAP control system pressure sensor and the circuit Loose, disconnected or improper connection of rubber tube Blocked rubber tube Cracked EVAP canister EVAP canister purge volume control solenoid valve circuit Accelerator pedal position sensor Blocked purge port EVAP canister vent control valve

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

Will CONSULT-III be used?

YES >> GO TO 2. NO >> GO TO 5.

< DTC/CIRCUIT DIAGNOSIS >

2.perform dtc confirmation procedure-i

With CONSULT-III

TESTING CONDITION:

Always perform test at a temperature of 5°C (41°F) or more.

- Start engine and warm it up to normal operating temperature.
- Turn ignition switch OFF and wait at least 10 seconds.
- 3. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.
- Start engine and let it idle for at least 70 seconds.
- Select "PURG FLOW P0441" of "EVAPORATIVE SYSTEM" in "DTC WORK SUPPORT" mode with CON-SULT-III.
- Touch "START". 7.

Is "COMPLETED" displayed on CONSULT-III screen?

YES >> GO TO 4.

NO >> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE-II

When the following conditions are met, "TESTING" will be displayed on the CONSULT-III screen. Maintain the conditions continuously until "TESTING" changes to "COMPLETED". (It will take at least 35 seconds.)

Selector lever	Suitable position
VHCL SPEED SE	32 - 120 km/h (20 - 75 MPH)
ENG SPEED	500 - 3,000 rpm
B/FUEL SCHDL	1.3 - 9.0 msec
COOLAN TEMP/S	More than 0°C (32°F)

CAUTION:

Always drive vehicle at a safe speed.

If "TESTING" does not change for a long time, retry from step 2.

Is "COMPLETED" displayed on CONSULT-III screen?

YES >> GO TO 4.

NO >> Perform DTC CONFIRMATION PROCEDURE again. GO TO 2.

f 4.PERFORM DTC CONFIRMATION PROCEDURE-III

Touch "SELF-DIAG RESULTS".

Which is displayed on CONSULT-III screen?

OK >> INSPECTION END

NG >> Go to EC-884, "Diagnosis Procedure".

${f 5.}$ PERFORM COMPONENT FUNCTION CHECK

Perform component function check. Refer to EC-883, "Component Function Check".

Use component function check to check the overall monitoring function of the EVAP control system purge flow monitoring. During this check, a 1st trip DTC might not be confirmed.

Is the inspection result normal?

>> INSPECTION END YES

>> Go to EC-884, "Diagnosis Procedure". NO

Component Function Check

1. PERFORM COMPONENT FUNCTION CHECK

With GST

- 1. Lift up drive wheels.
- Start engine (VDC switch OFF) and warm it up to normal operating temperature.

[VK50VE]

EC

D

Е

Н

N

Р

INFOID:0000000003958807

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

- Turn ignition switch OFF and wait at least 10 seconds.
- Start engine and wait at least 70 seconds.
- 5. Set voltmeter probes to ECM harness connector terminals under the following conditions.

ECM				
Connector	+	_		
Connector	Terminal	Terminal		
F111	80 (EVAP control system pressure sensor signal)	70		

- Check EVAP control system pressure sensor value at idle speed and note it.
- 7. Establish and maintain the following conditions for at least 1 minute.

Air conditioner switch	ON
Headlamp switch	ON
Rear window defogger switch	ON
Engine speed	Approx. 3,000 rpm
Gear position	Any position other than P, N or R

Verify that EVAP control system pressure sensor value stays 0.1 V less than the value at idle speed (measured at step 6) for at least 1 second.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-884, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003958808

1. CHECK EVAP CANISTER

- 1. Turn ignition switch OFF.
- 2. Check EVAP canister for cracks.

Is the inspection result normal?

YES-1 >> With CONSULT-III: GO TO 2.

YES-2 >> Without CONSULT-III: GO TO 3.

NO >> Replace EVAP canister.

2. CHECK PURGE FLOW

- (P) With CONSULT-III
- Disconnect vacuum hose connected to EVAP canister purge volume control solenoid valve at EVAP service port.
- Start engine and let it idle.
- Select "PURG VOL CONT/V" in "ACTIVE TEST" mode with CONSULT-III.
- Touch "Qd" and "Qu" on CONSULT-III screen to adjust "PURG VOL CONT/V" opening and check vacuum existence.

PURG VOL CONT/V	Vacuum
100%	Existed
0%	Not existed

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 4.

3. CHECK PURGE FLOW

- Start engine and warm it up to normal operating temperature.
- 2. Stop engine.

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

- Disconnect vacuum hose connected to EVAP canister purge volume control solenoid valve at EVAP service port and install vacuum gauge. For the location of EVAP service port, refer to EC-654, "System Description".
- Start engine and let it idle.

Never depress accelerator pedal even slightly.

Check vacuum gauge indication before 60 seconds pass after starting engine.

Vacuum should not exist.

Rev engine up to 2,000 rpm after 100 seconds pass after starting engine.

Vacuum should exist.

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 4.

4.CHECK EVAP PURGE LINE

- Turn ignition switch OFF.
- Check EVAP purge line for improper connection or disconnection. Refer to EC-654, "System Description".

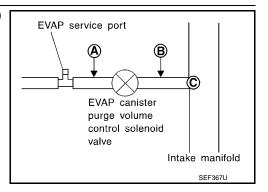
Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair EVAP purge line.

5.CHECK EVAP PURGE HOSE AND PURGE PORT

- Disconnect purge hoses connected to EVAP service port (A) and EVAP canister purge volume control solenoid valve (B).
- Blow air into each hose and EVAP purge port (**C**).



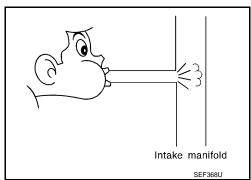
Check that air flows freely.

Is the inspection result normal?

YES-1 >> With CONSULT-III: GO TO 6.

YES-2 >> Without CONSULT-III: GO TO 7.

NO >> Repair or clean hoses and/or purge port.



6.CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

- With CONSULT-III
- Start engine.
- Perform "PURG VOL CONT/V" in "ACTIVE TEST" mode with CONSULT-III. Check that engine speed varies according to the valve opening.

Does engine speed vary according to the valve opening?

YES >> GO TO 8.

NO >> GO TO 7.

Revision: 2009 March

EC-885 2009 FX35/FX50

EC

D

Е

F

Н

K

M

Ν

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

7.CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-896, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 8.

NO >> Replace EVAP canister purge volume control solenoid valve.

8.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR CONNECTOR

- Disconnect EVAP control system pressure sensor harness connector.
- Check that water is not inside connectors.

Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace EVAP control system pressure sensor.

9.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR FUNCTION

Refer to EC-912, "DTC Logic" for DTC P0452, EC-917, "DTC Logic" for DTC P0453.

Is the inspection result normal?

YES >> GO TO 10.

NO >> Replace EVAP control system pressure sensor.

10.CHECK RUBBER TUBE FOR CLOGGING

- 1. Disconnect rubber tube connected to EVAP canister vent control valve.
- 2. Check the rubber tube for clogging.

Is the inspection result normal?

YES >> GO TO 11.

NO >> Clean the rubber tube using an air blower.

11. CHECK EVAP CANISTER VENT CONTROL VALVE

Refer to EC-903, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 12.

NO >> Replace EVAP canister vent control valve.

12. CHECK EVAP PURGE LINE

Inspect EVAP purge line (pipe and rubber tube). Check for evidence of leaks.

Refer to EC-654, "System Description".

Is the inspection result normal?

YES >> GO TO 13.

NO >> Repair or replace malfunctioning part.

13. CLEAN EVAP PURGE LINE

Clean EVAP purge line (pipe and rubber tube) using air blower.

>> GO TO 14.

14. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

[VK50VE]

P0442 EVAP CONTROL SYSTEM

DTC Logic

DTC DETECTION LOGIC

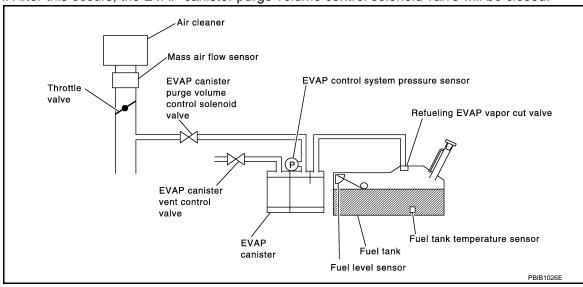
NOTE:

If DTC P0442 is displayed with DTC P0456, first perform the trouble diagnosis for DTC P0456. Refer to <u>EC-929, "DTC Logic"</u>.

This diagnosis detects leaks in the EVAP purge line using engine intake manifold vacuum.

If pressure does not increase, the ECM will check for leaks in the line between the fuel tank and EVAP canister purge volume control solenoid valve, under the following "Vacuum test" conditions.

The EVAP canister vent control valve is closed to shut the EVAP purge line off. The EVAP canister purge volume control solenoid valve will then be opened to depressurize the EVAP purge line using intake manifold vacuum. After this occurs, the EVAP canister purge volume control solenoid valve will be closed.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	
P0442	EVAP control system small leak detected (negative pressure)	EVAP control system has a leak, EVAP control system does not operate properly.	 Incorrect fuel tank vacuum relief valve Incorrect fuel filler cap used Fuel filler cap remains open or does not close. Foreign matter caught in fuel filler cap. Leak is in line between intake manifold and EVAP canister purge volume control solenoid valve. Foreign matter caught in EVAP canister vent control valve. EVAP canister or fuel tank leaks EVAP purge line (pipe and rubber tube) leaks EVAP purge line rubber tube bent Loose or disconnected rubber tube EVAP canister vent control valve and the circuit 	
			 EVAP canister purge volume control solenoid valve and the circuit Fuel tank temperature sensor O-ring of EVAP canister vent control valve is missing or damaged EVAP canister is saturated with water EVAP control system pressure sensor Fuel level sensor and the circuit Refueling EVAP vapor cut valve ORVR system leaks 	F

CAUTION

- Use only a genuine NISSAN fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the MIL may illuminate.
- If the fuel filler cap is not tightened properly, the MIL may illuminate.

Revision: 2009 March EC-887 2009 FX35/FX50

EC

Α

D

Е

F

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Use only a genuine NISSAN rubber tube as a replacement.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

NOTE:

Check that EVAP hoses are connected to EVAP canister purge volume control solenoid valve properly.

Will CONSULT-III be used?

YES >> GO TO 2. NO >> GO TO 3.

2. PERFORM DTC CONFIRMATION PROCEDURE

(P) With CONSULT-III

TESTING CONDITION:

- Perform "DTC WORK SUPPORT" when the fuel level is between 1/4 and 3/4 full, and vehicle is placed on flat level surface.
- Always perform test at a temperature of 0 to 30°C (32 to 86°F).
- 1. Turn ignition switch ON.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-III.
- 4. Check that the following conditions are met.

COOLAN TEMP/S: 0 - 70°C (32 - 158°F) INT/A TEMP SE: 0 - 30°C (32 - 86°F)

 Select "EVP SML LEAK PÒ442/P1442" of "EVAPORATIVE SYSTEM" in "DTC WORK SUPPORT" mode with CONSULT-III.

Follow the instructions displayed.

NOTE:

If the engine speed cannot be maintained within the range displayed on the CONSULT-III screen, go to EC-577, "BASIC INSPECTION: Special Repair Requirement".

Which is displayed on CONSULT-III screen?

OK >> INSPECTION END

NG >> Go to EC-888, "Diagnosis Procedure".

3.PERFORM DTC CONFIRMATION PROCEDURE

With GST

NOTE:

Be sure to read the explanation of Driving Pattern in <u>EC-1177</u>, "How to <u>Set SRT Code"</u> before driving vehicle.

- 1. Start engine.
- 2. Drive vehicle according to Driving Pattern.
- 3. Stop vehicle.
- 4. Turn ignition switch OFF, wait at least 10 seconds and then turn ON.
- 5. Check 1st trip DTC.

Is 1st trip DTC displayed?

YES-1 >> P0441: Go to <u>EC-884</u>, "<u>Diagnosis Procedure</u>". YES-2 >> P0442: Go to <u>EC-888</u>, "<u>Diagnosis Procedure</u>". NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003958810

1. CHECK FUEL FILLER CAP DESIGN

1. Turn ignition switch OFF.

< DTC/CIRCUIT DIAGNOSIS >

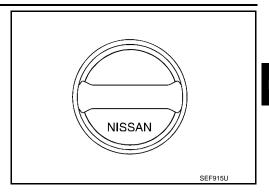
[VK50VE]

2. Check for genuine NISSAN fuel filler cap design.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace with genuine NISSAN fuel filler cap.



2.CHECK FUEL FILLER CAP INSTALLATION

Check that the cap is tightened properly by rotating the cap clockwise.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Open fuel filler cap, then clean cap and fuel filler neck threads using air blower. Retighten until ratcheting sound is heard.

3.CHECK FUEL FILLER CAP FUNCTION

Check for air releasing sound while opening the fuel filler cap.

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4. CHECK FUEL TANK VACUUM RELIEF VALVE

Refer to EC-892, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace fuel filler cap with a genuine one.

5.CHECK FOR EVAP LEAK

Refer to EC-1229, "Inspection".

Is there any leak in EVAP line?

YES >> Repair or replace malfunctioning part.

NO >> GO TO 6.

6. CHECK EVAP CANISTER VENT CONTROL VALVE

Check the following.

• EVAP canister vent control valve is installed properly.

Refer to EC-1231, "Removal and Installation".

EVAP canister vent control valve.

Refer to EC-903, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace EVAP canister vent control valve and O-ring.

7.CHECK IF EVAP CANISTER IS SATURATED WITH WATER

 Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.

EC

Α

С

D

Е

F

G

. .

Н

1

K

M

Ν

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

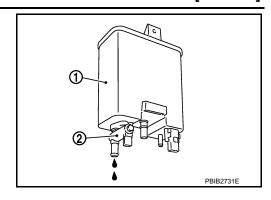
- 2. Check if water will drain from EVAP canister (1).
- EVAP canister vent control valve (2)

Does water drain from the EVAP canister?

YES >> GO TO 8.

NO-1 >> With CONSULT-III: GO TO 10.

NO-2 >> Without CONSULT-III: GO TO 11.



8. CHECK EVAP CANISTER

Weigh the EVAP canister with the EVAP canister vent control valve and EVAP control system pressure sensor attached.

The weight should be less than 2.1 kg (4.6 lb).

Is the inspection result normal?

YES-1 >> With CONSULT-III: GO TO 10.

YES-2 >> Without CONSULT-III: GO TO 11.

NO >> GO TO 9.

9. DETECT MALFUNCTIONING PART

Check the following.

- EVAP canister for damage
- EVAP hose between EVAP canister and vehicle frame for clogging or poor connection

>> Repair hose or replace EVAP canister.

10.check evap canister purge volume control solenoid valve operation

(P) With CONSULT-III

- 1. Disconnect vacuum hose from EVAP canister purge volume control solenoid valve at EVAP service port.
- 2. Start engine and let it idle.
- 3. Select "PURG VOL CONT/V" in "ACTIVE TEST" mode.
- 4. Touch "Qu" on CONSULT-III screen to increase "PURG VOL CONT/V" opening to 100%.
- 5. Check vacuum hose for vacuum.

Vacuum should exist.

Is the inspection result normal?

YES >> GO TO 13.

NO >> GO TO 12.

11. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

- 1. Start engine and warm it up to normal operating temperature.
- Stop engine.
- 3. Disconnect vacuum hose from EVAP canister purge volume control solenoid valve at EVAP service port.
- 4. Start engine and let it idle for at least 80 seconds.
- 5. Check vacuum hose for vacuum when revving engine up to 2,000 rpm.

Vacuum should exist.

Is the inspection result normal?

YES >> GO TO 13.

NO >> GO TO 12.

12. CHECK VACUUM HOSE

Check vacuum hoses for clogging or disconnection. Refer to <u>EC-654, "System Description"</u>. Is the inspection result normal?

Revision: 2009 March **EC-890** 2009 FX35/FX50

PU442 EVAP CONTROL STSTEM	D///F0\/F1
< DTC/CIRCUIT DIAGNOSIS >	[VK50VE]
YES >> GO TO 13. NO >> Repair or reconnect the hose.	
13. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE	
Refer to EC-896, "Component Inspection".	F
Is the inspection result normal?	
YES >> GO TO 14. NO >> Replace EVAP canister purge volume control solenoid valve.	
14. CHECK FUEL TANK TEMPERATURE SENSOR	
Refer to EC-844, "Component Inspection".	
Is the inspection result normal? YES >> GO TO 15.	
NO >> Replace "fuel level sensor unit and fuel pump".	
15. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR	
Refer to EC-911, "Component Inspection".	
Is the inspection result normal?	
YES >> GO TO 16.	
NO >> Replace EVAP control system pressure sensor.	
16. CHECK EVAP PURGE LINE	
Check EVAP purge line (pipe, rubber tube, fuel tank and EVAP canister) for cracks or improper Refer to EC-654, "System Diagram".	er connection.
Is the inspection result normal?	
YES >> GO TO 17.	
NO >> Repair or reconnect the hose.	
17.CLEAN EVAP PURGE LINE	
Clean EVAP purge line (pipe and rubber tube) using air blower.	
>> GO TO 18.	
18. CHECK EVAP/ORVR LINE	
Check EVAP/ORVR line between EVAP canister and fuel tank for clogging, kinks, looseness connection. For location, refer to <u>EC-1116</u> , " <u>Description</u> ".	ss and improper
Is the inspection result normal?	
YES >> GO TO 19.	
NO >> Repair or replace hoses and tubes.	
19.check recirculation line	
Check recirculation line between filler neck tube and fuel tank for clogging, kinks, cracks, improper connection.	, looseness and
Is the inspection result normal?	
YES >> GO TO 20.	
NO >> Repair or replace hose, tube or filler neck tube.	
20. CHECK REFUELING EVAP VAPOR CUT VALVE	
Refer to EC-1119, "Component Inspection".	
Is the inspection result normal?	
YES >> GO TO 21.	
NO >> Replace refueling EVAP vapor cut valve with fuel tank.	
21.CHECK FUEL LEVEL SENSOR	
Refer to MWI-63, "Component Inspection".	
Is the inspection result normal?	

Revision: 2009 March **EC-891** 2009 FX35/FX50

YES >> GO TO 22.

< DTC/CIRCUIT DIAGNOSIS >

NO >> Replace "fuel level sensor unit and fuel pump".

22. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

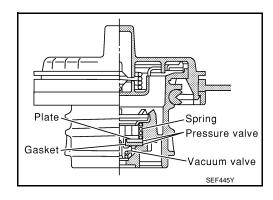
Component Inspection

INFOID:0000000003958811

[VK50VE]

1. CHECK FUEL FILLER CAP

- 1. Turn ignition switch OFF.
- 2. Remove fuel filler cap.
- 3. Wipe clean valve housing.



- 4. Install fuel filler cap adapter (commercial service tool) to fuel filler cap.
- 5. Check valve opening pressure and vacuum.

Pressure: 15.3 - 20.0 kPa (0.156 - 0.204 kg/cm², 2.22 -

2.90 psi)

Vacuum: -6.0 to -3.3 kPa (-0.061 to -0.034 kg/cm²,

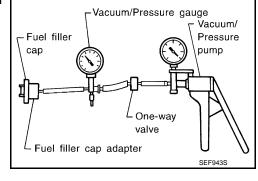
-0.87 to -0.48 psi)

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.REPLACE FUEL FILLER CAP



Replace fuel filler cap.

CAUTION:

Use only a genuine fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the MIL may illuminate.

>> INSPECTION END

P0443 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

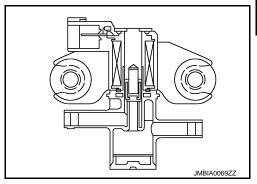
< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

P0443 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Description INFOID:0000000003958812

The EVAP canister purge volume control solenoid valve is used to control the flow rate of fuel vapor from the EVAP canister. The EVAP canister purge volume control solenoid valve is moved by ON/OFF pulses from the ECM. The longer the ON pulse, the greater the amount of fuel vapor that will flow through the valve.



DTC Logic INFOID:0000000003958813

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0443	EVAP canister purge volume control solenoid valve	The canister purge flow is detected during the specified driving conditions, even when EVAP canister purge volume control solenoid valve is completely closed.	EVAP control system pressure sensor EVAP canister purge volume control solenoid valve (The valve is stuck open.) EVAP canister vent control valve EVAP canister Hoses (Hoses are connected incorrectly or clogged.)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Always perform test at a temperature of 5°C (41°F) or more.

Will CONSULT-III be used?

YES >> GO TO 2.

NO >> GO TO 3.

2.PERFORM DTC CONFIRMATION PROCEDURE

(P) With CONSULT-III

- Start engine and warm it up to normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds. 4.
- Turn ignition switch ON.
- 6. Select "PURG VOL CN/V P1444" of "EVAPORATIVE SYSTEM" in "DTC WORK SUPPORT" mode with CONSULT-III.
- Touch "START".
- 8. Start engine and let it idle until "TESTING" on CONSULT-III changes to "COMPLETED". (It will take approximately 10 seconds.)

Which is displayed on CONSULT-III screen?

EC

Α

Е

D

If "TESTING" is not displayed after 5 minutes, retry from step 2. 9. Touch "SELF-DIAG RESULTS".

Revision: 2009 March

P0443 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS > [VK50VE]

OK >> INSPECTION END

NG >> Go to EC-894, "Diagnosis Procedure".

3.PERFORM DTC CONFIRMATION PROCEDURE

With GST

- 1. Start engine and warm it up to normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Turn ignition switch ON.
- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Start engine and let it idle for at least 20 seconds.
- 6. Check 1st trip DTC.

Is 1st trip DTC displayed?

YES >> Go to EC-894, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003958814

1. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE POWER SUPPLY CIRCUIT

- Turn ignition switch OFF.
- 2. Disconnect EVAP canister purge volume control solenoid valve harness connector.
- 3. Turn ignition switch ON.
- 4. Check the voltage between EVAP canister purge volume control solenoid valve harness connector and ground.

EVAP canister purge volun	Ground	Voltage	
Connector	Glound	voltage	
F7	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3. NO >> GO TO 2.

2. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E106, M6
- Harness connectors M116, F103
- Harness for open or short between EVAP canister purge volume control solenoid valve and IPDM E/R
- Harness for open or short between EVAP canister purge volume control solenoid valve and ECM
 - >> Repair open circuit, short to ground or short to power in harness or connectors.

3.CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check the continuity between EVAP canister purge volume control solenoid valve harness connector and ECM harness connector.

EVAP canister purge volum	EC	М	Continuity	
Connector	Terminal	Connector	Terminal	Continuity
F7	2	F110	8	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

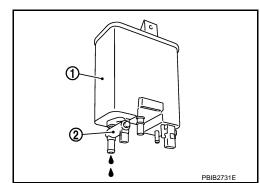
4.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR CONNECTOR

P0443 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE [VK50VE] < DTC/CIRCUIT DIAGNOSIS > Disconnect EVAP control system pressure sensor harness connector. Check that water is not inside connectors. Α Is the inspection result normal? YES >> GO TO 5. NO >> Replace EVAP control system pressure sensor. EC 5.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR Refer to EC-911, "Component Inspection". Is the inspection result normal? YES-1 >> With CONSULT-III: GO TO 6. YES-2 >> Without CONSULT-III: GO TO 7. >> Replace EVAP control system pressure sensor. 6.CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE With CONSULT-III Turn ignition switch OFF. Reconnect harness connectors disconnected. Perform "PURG VOL CONT/V" in "ACTIVE TEST" mode with CONSULT-III. Check that engine speed varies according to the valve opening. Does engine speed vary according to the valve opening? YES >> GO TO 8. NO >> GO TO 7. 7.CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE Refer to EC-896, "Component Inspection". Is the inspection result normal? YES >> GO TO 8. NO >> Replace EVAP canister purge volume control solenoid valve. 8.CHECK RUBBER TUBE FOR CLOGGING Disconnect rubber tube connected to EVAP canister vent control valve. Check the rubber tube for clogging. Is the inspection result normal? YES >> GO TO 9. NO >> Clean the rubber tube using an air blower. 9.CHECK EVAP CANISTER VENT CONTROL VALVE Refer to EC-903, "Component Inspection". Is the inspection result normal? YES >> GO TO 10. NO >> Replace EVAP canister vent control valve. 10.CHECK IF EVAP CANISTER IS SATURATED WITH WATER Ν Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached. Check if water will drain from EVAP canister (1).

EVAP canister vent control valve (2)

Does water drain from the EVAP canister?

YES >> GO TO 11. NO >> GO TO 13.



Р

EC-895 Revision: 2009 March 2009 FX35/FX50

P0443 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

11. CHECK EVAP CANISTER

Weigh the EVAP canister with the EVAP canister vent control valve and EVAP control system pressure sensor attached.

The weight should be less than 2.1 kg (4.6 lb).

Is the inspection result normal?

YES >> GO TO 13.

NO >> GO TO 12.

12. DETECT MALFUNCTIONING PART

Check the following.

- EVAP canister for damage
- EVAP hose between EVAP canister and vehicle frame for clogging or poor connection
 - >> Repair hose or replace EVAP canister.

13. CHECK INTERMITTENT INCIDENT

Refer to GI-35. "Intermittent Incident".

>> INSPECTION END

Component Inspection

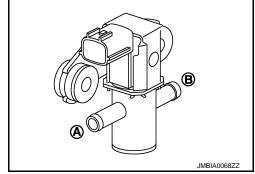
INFOID:0000000003958815

1. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

(P) With CONSULT-III

- Turn ignition switch OFF.
- 2. Reconnect all harness connectors disconnected.
- 3. Disconnect EVAP purge hoses connected to EVAP canister purge volume control solenoid valve.
- 4. Turn ignition switch ON.
- 5. Select "PURG VOL CONT/V" in "ACTIVE TEST" mode with CONSULT-III.
- Touch "Qd" and "Qu" on CONSULT-III screen to adjust "PURG VOL C/V" opening and check air passage continuity of EVAP canister purge volume control solenoid valve under the following conditions.

Condition (PURG VOL C/V value)	Air passage continuity between (A) and (B)
100%	Existed
0%	Not existed



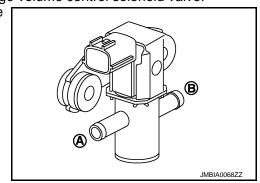
₩ Without CONSULT-III

- 1. Turn ignition switch OFF.
- Disconnect EVAP canister purge volume control solenoid valve harness connector.
- 3. Disconnect EVAP purge hoses connected to EVAP canister purge volume control solenoid valve.
- 4. Check air passage continuity of EVAP canister purge volume control solenoid valve under the following conditions.

Condition	Air passage continuity between (A) and (B)
12 V direct current supply between terminals 1 and 2	Existed
No supply	Not existed

Is the inspection result normal?

YES >> INSPECTION END



P0443 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS > [VK50VE]

NO >> Replace EVAP canister purge volume control solenoid valve

EC

Α

С

D

Е

F

G

Н

1

J

Κ

L

M

Ν

0

P0444, P0445 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

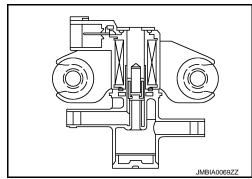
[VK50VE]

INFOID:0000000003958817

P0444, P0445 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Description INFOID:000000003958816

The EVAP canister purge volume control solenoid valve is used to control the flow rate of fuel vapor from the EVAP canister. The EVAP canister purge volume control solenoid valve is moved by ON/OFF pulses from the ECM. The longer the ON pulse, the greater the amount of fuel vapor that will flow through the valve.



DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition Possible cause	
P0444	EVAP canister purge volume control solenoid valve circuit open	An excessively low voltage signal is sent to ECM through the valve	Harness or connectors (The solenoid valve circuit is open or shorted.) EVAP canister purge volume control solenoid valve
P0445	EVAP canister purge volume control solenoid valve circuit shorted	An excessively high voltage signal is sent to ECM through the valve	Harness or connectors (The solenoid valve circuit is shorted.) EVAP canister purge volume control solenoid valve

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm battery voltage is more than 11 V at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine and let it idle for at least 13 seconds.
- 2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-898, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003958818

1. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE POWER SUPPLY CIRCUIT

- Turn ignition switch OFF.
- 2. Disconnect EVAP canister purge volume control solenoid valve harness connector.
- Turn ignition switch ON.

P0444, P0445 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Α

EC

D

Е

F

Н

 Check the voltage between EVAP canister purge volume control solenoid valve harness connector and ground.

EVAP canister purge volume control solenoid valve		Ground	Voltage
Connector	nector Terminal		
F7	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3. NO >> GO TO 2.

2.DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E106, M6
- Harness connectors M116, F103
- Harness for open or short between EVAP canister purge volume control solenoid valve and IPDM E/R
- Harness for open or short between EVAP canister purge volume control solenoid valve and ECM

>> Repair open circuit, short to ground or short to power in harness or connectors.

3. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check the continuity between EVAP canister purge volume control solenoid valve harness connector and ECM harness connector.

EVAP canister purge volume control solenoid valve		ECM		Continuity
Connector	Terminal	Connector	Terminal	
F7	2	F110	8	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES-1 >> With CONSULT-III: GO TO 4.

YES-2 >> Without CONSULT-III: GO TO 5.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

4. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

- (P) With CONSULT-III
- 1. Reconnect all harness connectors disconnected.
- Start engine.
- 3. Perform "PURG VOL CONT/V" in "ACTIVE TEST" mode with CONSULT-III. Check that engine speed varies according to the valve opening.

Does engine speed vary according to the valve opening?

YES >> GO TO 6. NO >> GO TO 5.

${f 5.}$ CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-900, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace EVAP canister purge volume control solenoid valve.

6.CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

Revision: 2009 March **EC-899** 2009 FX35/FX50

P0444, P0445 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

>> INSPECTION END

Component Inspection

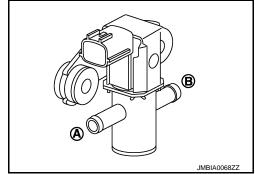
INFOID:0000000004032236

1. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

(P) With CONSULT-III

- 1. Turn ignition switch OFF.
- 2. Reconnect all harness connectors disconnected.
- 3. Disconnect EVAP purge hoses connected to EVAP canister purge volume control solenoid valve.
- Turn ignition switch ON.
- 5. Select "PURG VOL CONT/V" in "ACTIVE TEST" mode with CONSULT-III.
- Touch "Qd" and "Qu" on CONSULT-III screen to adjust "PURG VOL C/V" opening and check air passage continuity of EVAP canister purge volume control solenoid valve under the following conditions.

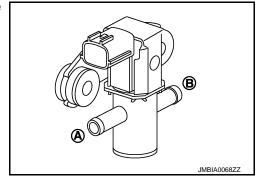
Condition (PURG VOL C/V value)	Air passage continuity between (A) and (B)
100%	Existed
0%	Not existed



Nithout CONSULT-III

- Turn ignition switch OFF.
- 2. Disconnect EVAP canister purge volume control solenoid valve harness connector.
- 3. Disconnect EVAP purge hoses connected to EVAP canister purge volume control solenoid valve.
- 4. Check air passage continuity of EVAP canister purge volume control solenoid valve under the following conditions.

Condition	Air passage continuity between (A) and (B)
12 V direct current supply between terminals 1 and 2	Existed
No supply	Not existed



Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace EVAP canister purge volume control solenoid valve

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Α

EC

D

Е

L

N

Р

INFOID:0000000003958822

P0447 EVAP CANISTER VENT CONTROL VALVE

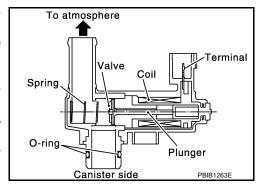
Description INFOID:0000000003958820

The EVAP canister vent control valve is located on the EVAP canister and is used to seal the canister vent.

This solenoid valve responds to signals from the ECM. When the ECM sends an ON signal, the coil in the solenoid valve is energized. A plunger will then move to seal the canister vent. The ability to seal the vent is necessary for the on board diagnosis of other evaporative emission control system components.

This solenoid valve is used only for diagnosis, and usually remains opened.

When the vent is closed, under normal purge conditions, the evaporative emission control system is depressurized and allows "EVAP Control System" diagnosis.



DTC Logic INFOID:0000000003958821

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0447	EVAP canister vent control valve circuit open	An improper voltage signal is sent to ECM through EVAP canister vent control valve.	Harness or connectors (The valve circuit is open or shorted.) EVAP canister vent control valve

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON. 2.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm battery voltage is more than 11 V at idle.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- Start engine and wait at least 8 seconds.
- Check 1st trip DTC.

Is 1st trip DTC detected?

>> Go to EC-901, "Diagnosis Procedure". YES

NO >> INSPECTION END

Diagnosis Procedure

1.INSPECTION START

Will CONSULT-III be used?

Will CONSULT-III be used?

YES >> GO TO 2. NO >> GO TO 3.

2.check evap canister vent control valve circuit

- With CONSULT-III
- Turn ignition switch OFF and then ON.
- Select "VENT CONTROL/V" in "ACTIVE TEST" mode with CONSULT-III.

EC-901 Revision: 2009 March 2009 FX35/FX50

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

- 3. Touch "ON/OFF" on CONSULT-III screen.
- 4. Check for operating sound of the valve.

Clicking sound should be heard.

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 3.

${f 3.}$ CHECK EVAP CANISTER VENT CONTROL VALVE POWER SUPPLY CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect EVAP canister vent control valve harness connector.
- 3. Turn ignition switch ON.
- 4. Check the voltage between EVAP canister vent control valve harness connector and ground.

EVAP canister vent control valve		Ground	Voltage
Connector	Terminal		
B253	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E106, M6
- Harness connectors B201, M117
- Harness for open or short between EVAP canister vent control valve and IPDM E/R
 - >> Repair open circuit, short to ground or short to power in harness or connectors.

5.check evap canister vent control valve output signal circuit for open and short

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check the continuity between EVAP canister vent control valve harness connector and ECM harness connector.

EVAP canister vent control valve		ECM		Continuity
Connector	Terminal	Connector	Terminal	
B253	2	M160	127	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 6.

6.DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B201, M117
- Harness for open or short between EVAP canister vent control valve and ECM
 - >> Repair open circuit, short to ground or short to power in harness or connectors.

7. CHECK RUBBER TUBE FOR CLOGGING

- Disconnect rubber tube connected to EVAP canister vent control valve.
- 2. Check the rubber tube for clogging.

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 8.

NO >> Clean the rubber tube using an air blower.

8.CHECK EVAP CANISTER VENT CONTROL VALVE

Refer to EC-903, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace EVAP canister vent control valve.

9. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

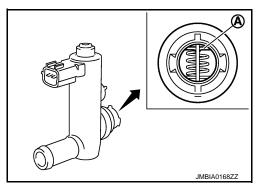
1. CHECK EVAP CANISTER VENT CONTROL VALVE-I

- Turn ignition switch OFF.
- Remove EVAP canister vent control valve from EVAP canister.
- 3. Check portion (A) of EVAP canister vent control valve for rust.

Is it rusted?

YES >> Replace EVAP canister vent control valve

NO >> GO TO 2.

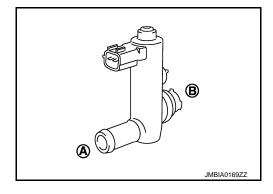


2.CHECK EVAP CANISTER VENT CONTROL VALVE-II

- (P) With CONSULT-III
- 1. Reconnect harness connectors disconnected.
- Turn ignition switch ON.
- 3. Perform "VENT CONTROL/V" in "ACTIVE TEST" mode.
- 4. Check air passage continuity and operation delay time. Check that new O-ring is installed properly.

VENT CONTROL/V Condition	Air passage continuity between (A) and (B)
ON	Not existed
OFF	Existed

Operation takes less than 1 second.



Without CONSULT-III

- 1. Disconnect EVAP canister vent control valve harness connector.
- 2. Check air passage continuity and operation delay time under the following conditions. Check that new O-ring is installed properly.

[VK50VE]

INFOID:0000000003958823

EC

Α

D

Е

Н

K

M

Ν

Р

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Condition	Air passage continuity between (A) and (B)
12 V direct current supply between terminals 1 and 2	Not existed
OFF	Existed

Operation takes less than 1 second.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace EVAP canister vent control valve

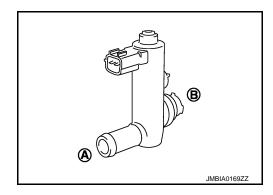
3.CHECK EVAP CANISTER VENT CONTROL VALVE-III

(I) With CONSULT-III

- 1. Clean the air passage [portion (A) to (B)] of EVAP canister vent control valve using an air blower.
- Perform "VENT CONTROL/V" in "ACTIVE TEST" mode.
- Check air passage continuity and operation delay time.
 Check that new O-ring is installed properly.

VENT CONTROL/V Condition	Air passage continuity between (A) and (B)
ON	Not existed
OFF	Existed

Operation takes less than 1 second.



Nithout CONSULT-III

- 1. Clean the air passage [portion (A) to (B)] of EVAP canister vent control valve using an air blower.
- 2. Check air passage continuity and operation delay time under the following conditions. Check that new O-ring is installed properly.

Condition	Air passage continuity between (A) and (B)
12 V direct current supply between terminals 1 and 2	Not existed
OFF	Fxisted

Operation takes less than 1 second.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace EVAP canister vent control valve

[VK50VE]

P0448 EVAP CANISTER VENT CONTROL VALVE

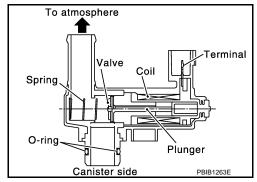
Description INFOID:0000000003958824

The EVAP canister vent control valve is located on the EVAP canister and is used to seal the canister vent.

This solenoid valve responds to signals from the ECM. When the ECM sends an ON signal, the coil in the solenoid valve is energized. A plunger will then move to seal the canister vent. The ability to seal the vent is necessary for the on board diagnosis of other evaporative emission control system components.

This solenoid valve is used only for diagnosis, and usually remains opened.

When the vent is closed, under normal purge conditions, the evaporative emission control system is depressurized and allows "EVAP Control System" diagnosis.



DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	
P0448	EVAP canister vent control valve close	EVAP canister vent control valve remains closed under specified driving conditions.	EVAP canister vent control valve EVAP control system pressure sensor and the circuit Blocked rubber tube to EVAP canister vent control valve EVAP canister is saturated with water	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Turn ignition switch ON and wait at least 5 seconds.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Start engine and let it idle for at least 1 minute.
- 4. Repeat next procedures 3 times.
- Increase the engine speed up to between 3,000 and 3,500 rpm and maintain that speed for 2 minutes and 50 seconds to 3 minutes.

Do not exceed 3 minutes.

- Fully released accelerator pedal and keep engine idle for approximately 5 seconds.
- Repeat next procedure 20 times.
- Quickly increase the engine speed up to between 4,000 and 4,500 rpm and maintain that speed for 25 to 30 seconds.

EC

Α

С

D

Е

F

Н

K

L

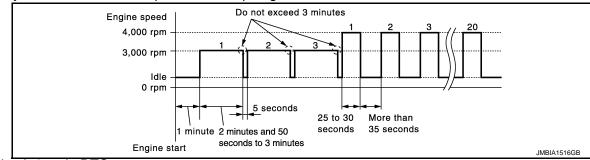
M

Ν

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Fully released accelerator pedal and keep engine idle for at least 35 seconds.



6. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-906, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003958826

1. CHECK RUBBER TUBE

- 1. Turn ignition switch OFF.
- 2. Disconnect rubber tube connected to EVAP canister vent control valve.
- 3. Check the rubber tube for clogging.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Clean rubber tube using an air blower.

2. CHECK EVAP CANISTER VENT CONTROL VALVE

Refer to EC-907, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace EVAP canister vent control valve.

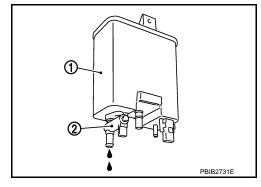
${f 3}.$ CHECK IF EVAP CANISTER IS SATURATED WITH WATER

- Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
- 2. Check if water will drain from the EVAP canister (1).
- EVAP canister vent control valve (2)

Does water drain from EVAP canister?

YES >> GO TO 4.

NO >> GO TO 6.



4. CHECK EVAP CANISTER

Weigh the EVAP canister with the EVAP canister vent control valve and EVAP control system pressure sensor attached.

The weight should be less than 2.1 kg (4.6 lb).

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

• EVAP canister for damage

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

- EVAP hose between EVAP canister and vehicle frame for clogging or poor connection
 - >> Repair hose or replace EVAP canister.

6.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR CONNECTOR

- Disconnect EVAP control system pressure sensor harness connector.
- Check that water is not inside connectors.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace EVAP control system pressure sensor.

7.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-911, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 8.

NO >> Replace EVAP control system pressure sensor.

8. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

1. CHECK EVAP CANISTER VENT CONTROL VALVE-I

Turn ignition switch OFF.

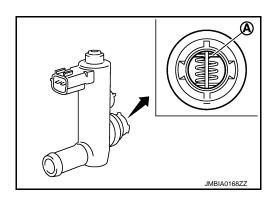
Component Inspection

- Remove EVAP canister vent control valve from EVAP canister.
- Check portion (A) of EVAP canister vent control valve for rust.

Is it rusted?

YES >> Replace EVAP canister vent control valve

NO >> GO TO 2.



2.CHECK EVAP CANISTER VENT CONTROL VALVE-II

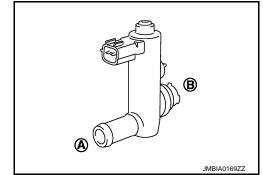
With CONSULT-III

- 1. Reconnect harness connectors disconnected.
- 2. Turn ignition switch ON.
- 3. Perform "VENT CONTROL/V" in "ACTIVE TEST" mode.
- Check air passage continuity and operation delay time.

Check that new O-ring is installed properly.

VENT CONTROL/V Condition	Air passage continuity between (A) and (B)
ON	Not existed
OFF	Existed

Operation takes less than 1 second.



Without CONSULT-III

EC-907 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

Н

INFOID:0000000004032237

M

Ν

Р

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

- 1. Disconnect EVAP canister vent control valve harness connector.
- 2. Check air passage continuity and operation delay time under the following conditions.

Check that new O-ring is installed properly.

Condition	Air passage continuity between (A) and (B)
12 V direct current supply between terminals 1 and 2	Not existed
OFF	Existed

Operation takes less than 1 second.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace EVAP canister vent control valve

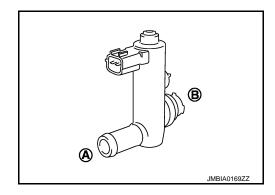
3.CHECK EVAP CANISTER VENT CONTROL VALVE-III

(II) With CONSULT-III

- 1. Clean the air passage [portion (A) to (B)] of EVAP canister vent control valve using an air blower.
- 2. Perform "VENT CONTROL/V" in "ACTIVE TEST" mode.
- Check air passage continuity and operation delay time.
 Check that new O-ring is installed properly.

VENT CONTROL/V Condition	Air passage continuity between (A) and (B)
ON	Not existed
OFF	Existed

Operation takes less than 1 second.



₩ Without CONSULT-III

- 1. Clean the air passage [portion (A) to (B)] of EVAP canister vent control valve using an air blower.
- 2. Check air passage continuity and operation delay time under the following conditions.

Check that new O-ring is installed properly.

Condition	Air passage continuity between (A) and (B)
12 V direct current supply between terminals 1 and 2	Not existed
OFF	Existed

Operation takes less than 1 second.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace EVAP canister vent control valve

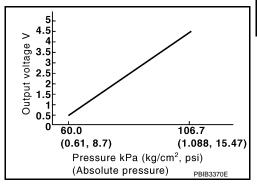
< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

P0451 EVAP CONTROL SYSTEM PRESSURE SENSOR

Description INFOID:000000003958828

The EVAP control system pressure sensor detects pressure in the purge line. The sensor output voltage to the ECM increases as pressure increases.



DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0451	EVAP control system pressure sensor performance	ECM detects a sloshing signal from the EVAP control system pressure sensor	Harness or connectors (EVAP control system pressure sensor circuit is shorted.) (APP sensor 2 circuit is shorted.) (Battery current sensor circuit is shorted.) [Camshaft position sensor (bank 1) circuit is shorted.] (Crankshaft position sensor circuit is shorted.) [Exhaust valve timing control position sensor (bank 1) circuit is shorted.] (Manifold pressure sensor circuit is shorted.) EVAP control system pressure sensor Accelerator pedal position sensor Battery current sensor Camshaft position sensor (bank 1) Crankshaft position sensor Exhaust valve timing control position sensor (bank 1) Manifold pressure sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

EC-909

- Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and wait at least 40 seconds.

NOTE:

Do not depress accelerator pedal even slightly.

Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-910, "Diagnosis Procedure".

NO >> INSPECTION END

EC

Α

Е

F

L

M

Ν

Р

D

INFOID:0000000003958829

2009 FX35/FX50

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Diagnosis Procedure

INFOID:0000000003958830

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR CONNECTOR

- 1. Disconnect EVAP control system pressure sensor harness connector.
- 2. Check that water is not inside connectors.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace harness connector.

3.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT

- Turn ignition switch ON.
- 2. Check the voltage between EVAP control system pressure sensor harness connector and ground.

	trol system e sensor	Ground	Voltage (V)
Connector	Terminal		
B252	3	Ground	Approx. 5

Is the inspection result normal?

YES >> GO TO 8. NO >> GO TO 4.

4. CHECK SENSOR POWER SUPPLY CIRCUIT

Check harness for short to power and short to ground, between the following terminals.

ECM		Sensor				
Connector	Terminal	Name	Connector	Terminal		
	87	Crankshaft position sensor	F2	1		
	91	Camshaft position sensor (bank 1)	F84	1		
F111		EVT control position sensor (bank 1)	F59	1		
1 111	95	Battery current sensor	E21	1		
		EVAP control system pressure sensor	B252	3		
		Manifold pressure sensor	F65	3		
M160	99	APP sensor 2 (Without ICC)	E112	6		
		APP sensor 2 (With ICC)	E116	3		

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair short to ground or short to power in harness or connectors.

5. CHECK COMPONENTS

Check the following.

- Battery current sensor (Refer to EC-1019, "Component Inspection".)
- Camshaft position sensor (bank 1) (Refer to EC-875, "Component Inspection".)
- Crankshaft position sensor (Refer to EC-870, "Component Inspection".)
- Exhaust valve timing control position sensor (bank 1) (Refer to EC-972, "Component Inspection".)
- Manifold pressure sensor (Refer to EC-1115, "Component Inspection".)

Is the inspection result normal?

[VK50VE] < DTC/CIRCUIT DIAGNOSIS > YES >> GO TO 6. NO >> Replace malfunctioning component. Α 6.CHECK APP SENSOR Refer to EC-1074, "Component Inspection". EC Is the inspection result normal? YES >> GO TO 9. NO >> GO TO 7. 7. REPLACE ACCELERATOR PEDAL ASSEMBLY Replace accelerator pedal assembly Perform EC-1075, "Special Repair Requirement". D >> INSPECTION END Е 8.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR Refer to EC-911, "Component Inspection". Is the inspection result normal? F YES >> GO TO 9. NO >> Replace EVAP control system pressure sensor. 9. CHECK INTERMITTENT INCIDENT Refer to GI-35, "Intermittent Incident". Н >> INSPECTION END Component Inspection INFOID:000000000395883 1. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR 1. Turn ignition switch OFF. Remove EVAP control system pressure sensor with its harness connector. Always replace O-ring with a new one. 3. Install a vacuum pump to EVAP control system pressure sensor. Turn ignition switch ON and check output voltage between ECM harness connector terminals under the following conditions. **ECM** Condition Voltage (V) [Applied vacuum kPa (kg/cm², psi)] Connector Terminal **Terminal** Not applied 1.8 - 4.8 F111 80 70 -26.7 (-0.272, -3.87) 2.1 to 2.5 lower than above value **CAUTION:** Ν · Always calibrate the vacuum pump gauge when using it. Never apply below -93.3 kPa (-0.952 kg/cm², -13.53 psi) or pressure over 101.3 kPa (1.033 kg/cm², 14.69 psi). Is the inspection result normal? YES >> INSPECTION END NO >> Replace EVAP control system pressure sensor. Р

Revision: 2009 March EC-911 2009 FX35/FX50

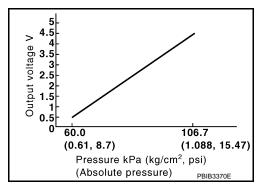
< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

P0452 EVAP CONTROL SYSTEM PRESSURE SENSOR

Description INFOID:000000004032238

The EVAP control system pressure sensor detects pressure in the purge line. The sensor output voltage to the ECM increases as pressure increases.



DTC Logic

INFOID:0000000003958833

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0452	EVAP control system pressure sensor low input	An excessively low voltage from the sensor is sent to ECM.	Harness or connectors (EVAP control system pressure sensor circuit is open or shorted.) (APP sensor 2 circuit is shorted.) (Battery current sensor circuit is shorted.) [Camshaft position sensor (bank 1) circuit is shorted.] (Crankshaft position sensor circuit is shorted.) [EVT control position sensor (bank 1) circuit is shorted.] (Manifold pressure sensor circuit is shorted.) EVAP control system pressure sensor Accelerator pedal position sensor Battery current sensor Camshaft position sensor (bank 1) Crankshaft position sensor Exhaust valve timing control position sensor (bank 1) Manifold pressure sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Always perform test at a temperature of 5°C (41°F) or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

(P) With CONSULT-III

- 1. Start engine and warm it up to normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Turn ignition switch ON.
- 6. Select "DATA MONITOR" mode with CONSULT-III.
- 7. Check that "FUEL T/TMP SE" is more than 0°C (32°F).
- 8. Start engine and wait at least 20 seconds.

P0452 EVAP CONTROL SYSTEM PRESSURE SENSOR [VK50VE] < DTC/CIRCUIT DIAGNOSIS > Check 1st trip DTC. With GST Α 1. Start engine and warm it up to normal operating temperature. Set voltmeter probes to ECM harness connector terminals under the following conditions. EC **ECM** + Connector **Terminal** Terminal 120 M160 128 (Fuel tank temperature sensor signal) D Check that the voltage is less than 4.2 V. Turn ignition switch OFF and wait at least 10 seconds. Turn ignition switch ON. Е 6. Turn ignition switch OFF and wait at least 10 seconds. Start engine and wait at least 20 seconds. Check 1st trip DTC. Is 1st trip DTC detected? F YES >> Go to EC-913, "Diagnosis Procedure". NO >> INSPECTION END Diagnosis Procedure INFOID:000000000395883 1. CHECK GROUND CONNECTION Turn ignition switch OFF. Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection". Is the inspection result normal? YES >> GO TO 2. NO >> Repair or replace ground connection. 2.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR CONNECTOR Disconnect EVAP control system pressure sensor harness connector. Check that water is not inside connectors. Is the inspection result normal? K YES >> GO TO 3. NO >> Repair or replace harness connector. 3.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT-I L 1. Turn ignition switch ON. Check the voltage between EVAP control system pressure sensor harness connector and ground. N

	trol system e sensor	Ground	Voltage (V)
Connector	Terminal		
B252	3	Ground	Approx. 5

Is the inspection result normal?

>> GO TO 10. YES

NO >> GO TO 4.

f 4.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT-II

- Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check the continuity between EVAP control system pressure sensor harness connector and ECM harness connector.

Р

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

EVAP cont	•	ECM		Continuity
Connector	Terminal	Connector	Terminal	
B252	3	F111	95	Existed

Is the inspection result normal?

YES >> GO TO 6. NO >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B201, M117
- Harness connectors M116. F103
- Harness for open between ECM and EVAP control system pressure sensor

>> Repair open circuit.

6. CHECK SENSOR POWER SUPPLY CIRCUIT

Check harness for short to power and short to ground, between the following terminals.

ECM		Sensor				
Connector	Terminal	Name	Connector	Terminal		
	87	Crankshaft position sensor	F2	1		
	91	Camshaft position sensor (bank 1)	F84	1		
F111		EVT control position sensor (bank 1)	F59	1		
1 111	95	Battery current sensor	E21	1		
		95	EVAP control system pressure sensor	B252	3	
			Manifold pressure sensor	F65	3	
M160	99	APP sensor 2 (Without ICC)	E112	6		
W160	33	APP sensor 2 (With ICC)	E116	3		

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair short to ground or short to power in harness or connectors.

7. CHECK COMPONENTS

Check the following.

- Battery current sensor (Refer to <u>EC-1019, "Component Inspection"</u>.)
- Camshaft position sensor (bank 1) (Refer to EC-875, "Component Inspection".)
- Crankshaft position sensor (Refer to <u>EC-870, "Component Inspection"</u>.)
- Exhaust valve timing control position sensor (bank 1) (Refer to <u>EC-972, "Component Inspection"</u>.)
- Manifold pressure sensor (Refer to EC-1115, "Component Inspection".)

Is the inspection result normal?

YES >> GO TO 8.

NO >> Replace malfunctioning component.

8. CHECK APP SENSOR

Refer to EC-1074, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 15.

NO >> GO TO 9.

9. REPLACE ACCELERATOR PEDAL ASSEMBLY

- 1. Replace accelerator pedal assembly
- 2. Perform EC-1075, "Special Repair Requirement".

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

>> INSPECTION END

10.check evap control system pressure sensor ground circuit for open and SHORT

1. Turn ignition switch OFF.

- 2. Disconnect ECM harness connector.
- 3. Check the continuity between EVAP control system pressure sensor harness connector and ECM harness connector.

EVAP control system pressure sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	
B252	1	F111	70	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 12.

NO >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B201, M117
- Harness connectors M116, F103
- Harness for open or short between EVAP control system pressure sensor and ECM

>> Repair open circuit, short to ground or short to power in harness or connectors.

12.check evap control system pressure sensor input signal circuit for open and SHORT

Check the continuity between EVAP control system pressure sensor harness connector and ECM harness connector.

EVAP control system pressure sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	
B252	2	F111	80	Existed

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 14.

NO >> GO TO 13.

13.detect malfunctioning part

Check the following.

- Harness connectors B201, M117
- Harness connectors M116, F103
- Harness for open or short between EVAP control system pressure sensor and ECM

>> Repair open circuit, short to ground or short to power in harness or connectors.

14. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-916, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 15.

NO >> Replace EVAP control system pressure sensor. EC

Α

Е

D

Н

K

N

Р

EC-915 Revision: 2009 March 2009 FX35/FX50

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

15. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000004032239

1. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

- 1. Turn ignition switch OFF.
- 2. Remove EVAP control system pressure sensor with its harness connector.

Always replace O-ring with a new one.

- 3. Install a vacuum pump to EVAP control system pressure sensor.
- 4. Turn ignition switch ON and check output voltage between ECM harness connector terminals under the following conditions.

ECM			Condition	Voltage (V)	
Connector	+ -		Condition [Applied vacuum kPa (kg/cm ² , psi)]		
Connector	Terminal	Terminal	[, ipplied vacadili iii a (iig/oiii ; pol/j		
F111	80	70	Not applied	1.8 - 4.8	
1 111	30	70	-26.7 (-0.272, -3.87)	2.1 to 2.5 lower than above value	

CAUTION:

- Always calibrate the vacuum pump gauge when using it.
- Never apply below -93.3 kPa (-0.952 kg/cm², -13.53 psi) or pressure over 101.3 kPa (1.033 kg/cm², 14.69 psi).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace EVAP control system pressure sensor.

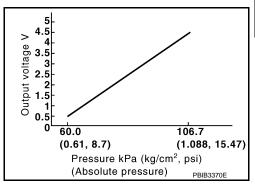
< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

P0453 EVAP CONTROL SYSTEM PRESSURE SENSOR

Description INFOID:0000000004032240

The EVAP control system pressure sensor detects pressure in the purge line. The sensor output voltage to the ECM increases as pressure increases.



DTC Logic

DTC DETECTION LOGIC

DTC No. DTC detecting condition Possible cause Trouble diagnosis name Harness or connectors (EVAP control system pressure sensor circuit is open or shorted.) (APP sensor 2 circuit is shorted.) Н (Battery current sensor circuit is shorted.) [Camshaft position sensor (bank 1) circuit is shorted.] [Crankshaft position sensor circuit is shorted.] [Exhaust valve timing control position sensor (bank 1) circuit is shorted.] EVAP control system (Manifold pressure sensor circuit is shorted.) An excessively high voltage from P0453 pressure sensor high in-· EVAP control system pressure sensor the sensor is sent to ECM. put · Accelerator pedal position sensor · Battery current sensor · Camshaft position sensor (bank 1) · Crankshaft position sensor K • Exhaust valve timing control position sensor (bank 1) · Manifold pressure sensor · EVAP canister vent control valve EVAP canister · Rubber hose from EVAP canister vent control valve to vehicle frame

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Always perform test at a temperature of 5°C (41°F) or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- With CONSULT-III
- 1. Start engine and warm it up to normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.

EC

Α

D

Е

F

INFOID:0000000003958837

F

M

Ν

Revision: 2009 March EC-917 2009 FX35/FX50

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

- Turn ignition switch OFF and wait at least 10 seconds.
- 5. Turn ignition switch ON.
- 6. Select "DATA MONITOR" mode with CONSULT-III.
- 7. Check that "FUEL T/TMP SE" is more than 0°C (32°F).
- Start engine and wait at least 20 seconds.
- 9. Check 1st trip DTC.
- With GST
- Start engine and warm it up to normal operating temperature.
- 2. Set voltmeter probes to ECM harness connector terminals under the following conditions.

	ECM	Ground
Connector	+	_
	Terminal	Terminal
M160	120 (Fuel tank temperature sensor signal)	128

- Check that the voltage is less than 4.2 V.
- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Turn ignition switch ON.
- 6. Turn ignition switch OFF and wait at least 10 seconds.
- 7. Start engine and wait at least 20 seconds.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-918, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003958838

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR CONNECTOR

- Disconnect EVAP control system pressure sensor harness connector.
- Check that water is not inside connectors.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace harness connector.

3.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT

- Turn ignition switch ON.
- 2. Check the voltage between EVAP control system pressure sensor harness connector and ground.

EVAP control syster	Ground	Voltage (V)	
Connector Terminal		Ground	voilage (v)
B252	3	Ground	Approx. 5

Is the inspection result normal?

YES >> GO TO 10.

NO >> GO TO 4.

4. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT-II

- Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Check the continuity between EVAP control system pressure sensor harness connector and ECM harness connector.

EVAP control system pressure sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	Continuity
B252	3	M160	107	Existed

EC

Α

Is the inspection result normal?

YES >> GO TO 6. NO >> GO TO 5.

5. DETECT MALFUNCTIONING PART

D

Check the following.

- Harness connectors B201, M117
- Harness connectors M116, F103
- Harness for open between ECM and EVAP control system pressure sensor

>> Repair open circuit.

6.CHECK SENSOR POWER SUPPLY CIRCUIT

Check harness for short to power and short to ground, between the following terminals.

ECM Sensor **Terminal Terminal** Connector Name Connector 87 F2 1 Crankshaft position sensor F84 1 Camshaft position sensor (bank 1) 91 EVT control position sensor (bank 1) F59 1 F111 Battery current sensor E21 1 95 EVAP control system pressure sensor B252 3 F65 3 Manifold pressure sensor APP sensor 2 (Without ICC) E112 6 M160 99 APP sensor 2 (With ICC) E116 3

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair short to ground or short to power in harness or connectors.

.CHECK COMPONENTS

Check the following.

- Battery current sensor (Refer to <u>EC-1019</u>, "Component Inspection".)
- Camshaft position sensor (bank 1) (Refer to EC-875, "Component Inspection".)
- Crankshaft position sensor (Refer to <u>EC-870</u>, "Component Inspection".)
- Exhaust valve timing control position sensor (bank 1) (Refer to EC-972, "Component Inspection".)
- Manifold pressure sensor (Refer to <u>EC-1115</u>, "Component Inspection".)

Is the inspection result normal?

YES >> GO TO 8.

NO >> Replace malfunctioning component.

$oldsymbol{\mathsf{S}}.\mathsf{CHECK}$ APP SENSOR

Refer to EC-1074, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 20.

NO >> GO TO 9.

9. REPLACE ACCELERATOR PEDAL ASSEMBLY

Replace accelerator pedal assembly

EC-919 Revision: 2009 March 2009 FX35/FX50

Е

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Perform <u>EC-1075</u>, "Special Repair Requirement".

>> INSPECTION END

10.check evap control system pressure sensor ground circuit for open and short

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check the continuity between EVAP control system pressure sensor harness connector and ECM harness connector.

EVAP control system pressure sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	
B252	1	F111	70	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 12. NO >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B201, M117
- Harness connectors M116, F103
- Harness for open or short between EVAP control system pressure sensor and ECM

>> Repair open circuit, short to ground or short to power in harness or connectors.

12.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

Check the continuity between EVAP control system pressure sensor harness connector and ECM harness connector.

EVAP control system pressure sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	
B252	2	F111	80	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 14. NO >> GO TO 13.

13. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B201, M117
- Harness connectors M116, F103
- Harness for open or short between EVAP control system pressure sensor and ECM

>> Repair open circuit, short to ground or short to power in harness or connectors.

14. CHECK RUBBER TUBE

- 1. Disconnect rubber tube connected to EVAP canister vent control valve.
- 2. Check the rubber tube for clogging.

Is the inspection result normal?

YES >> GO TO 15.

< DTC/CIRCUIT DIAGNOSIS >

NO >> Clean the rubber tube using an air blower, repair or replace rubber tube.

15. CHECK EVAP CANISTER VENT CONTROL VALVE

Refer to EC-903, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 16.

NO >> Replace EVAP canister vent control valve.

16. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-921, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 17.

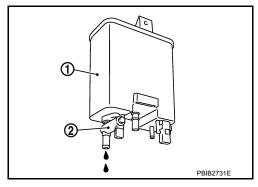
NO >> Replace EVAP control system pressure sensor.

17. CHECK IF EVAP CANISTER IS SATURATED WITH WATER

- Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
- 2. Check if water will drain from the EVAP canister (1).
- EVAP canister vent control valve (2)

Does water drain from EVAP canister?

YES >> GO TO 18. NO >> GO TO 20.



18. CHECK EVAP CANISTER

Weigh the EVAP canister with the EVAP canister vent control valve and EVAP control system pressure sensor attached.

The weight should be less than 2.1 kg (4.6 lb).

Is the inspection result normal?

YES >> GO TO 20. NO >> GO TO 19.

19. DETECT MALFUNCTIONING PART

Check the following.

- EVAP canister for damage
- EVAP hose between EVAP canister and vehicle frame for clogging or poor connection

>> Repair hose or replace EVAP canister.

20. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

1. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

- Turn ignition switch OFF.
- 2. Remove EVAP control system pressure sensor with its harness connector.

Always replace O-ring with a new one.

- 3. Install a vacuum pump to EVAP control system pressure sensor.
- Turn ignition switch ON and check output voltage between ECM harness connector terminals under the following conditions.

EC

Α

[VK50VE]

C

D

Е

F

0

J

Κ

M

N

0

INFOID:0000000004032241

2009 FX35/FX50

Revision: 2009 March

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

ECM			Condition		
Connector	+	_	Condition [Applied vacuum kPa (kg/cm ² , psi)]	Voltage (V)	
Connector	Terminal	Terminal	[tppned raedam in a (itgrem ; per/]		
F111	80	70	Not applied	1.8 - 4.8	
1 111	00	70	-26.7 (-0.272, -3.87)	2.1 to 2.5 lower than above value	

CAUTION:

- Always calibrate the vacuum pump gauge when using it.
- Never apply below -93.3 kPa (-0.952 kg/cm², -13.53 psi) or pressure over 101.3 kPa (1.033 kg/cm², 14.69 psi).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace EVAP control system pressure sensor.

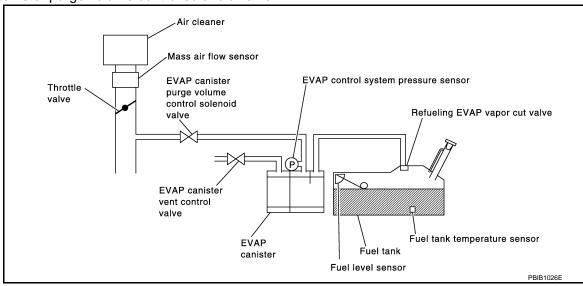
[VK50VE]

P0455 EVAP CONTROL SYSTEM

DTC Logic INFOID:0000000003958840

DTC DETECTION LOGIC

This diagnosis detects a very large leak (fuel filler cap fell off etc.) in EVAP system between the fuel tank and EVAP canister purge volume control solenoid valve.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0455	EVAP control system gross leak detected	EVAP control system has a very large leak such as fuel filler cap fell off, EVAP control system does not operate properly.	 Fuel filler cap remains open or does not close. Incorrect fuel tank vacuum relief valve Incorrect fuel filler cap used Foreign matter caught in fuel filler cap. Leak is in line between intake manifold and EVAP canister purge volume control solenoid valve. Foreign matter caught in EVAP canister vent control valve. EVAP canister or fuel tank leaks EVAP purge line (pipe and rubber tube) leaks EVAP purge line rubber tube bent. Loose or disconnected rubber tube EVAP canister vent control valve and the circuit EVAP canister purge volume control solenoid valve and the circuit Fuel tank temperature sensor O-ring of EVAP canister vent control valve is missing or damaged. EVAP control system pressure sensor Refueling EVAP vapor cut valve ORVR system leaks

CAUTION:

- Use only a genuine NISSAN fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the MIL may illuminate.
- If the fuel filler cap is not tightened properly, the MIL may illuminate.
- Use only a genuine NISSAN rubber tube as a replacement.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

Never remove fuel filler cap during the DTC Confirmation Procedure.

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

EC-923 Revision: 2009 March 2009 FX35/FX50

EC

Α

C

D

Е

F

Н

Р

< DTC/CIRCUIT DIAGNOSIS >

- Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

NOTE:

Check that EVAP hoses are connected to EVAP canister purge volume control solenoid valve properly.

Will CONSULT-III be used?

YES >> GO TO 2. NO >> GO TO 4.

2.PERFORM DTC CONFIRMATION PROCEDURE

(P) With CONSULT-III

TESTING CONDITION:

- Perform "DTC WORK SUPPORT" when the fuel level is between 1/4 and 3/4 full, and vehicle is placed on flat level surface.
- Open engine hood before conducting the following procedures.
- 1. Tighten fuel filler cap securely until ratcheting sound is heard.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.
- 4. Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-III.
- 5. Check that the following conditions are met.

COOLAN TEMP/S: 0 - 70°C (32 - 158°F)

INT/A TEMP SE: 0 - 60°C (32 - 140°F)

6. Select "EVP SML LEAK P0442/P1442" of "EVAPORATIVE SYSTEM" in "DTC WORK SUPPORT" mode with CONSULT-III.

Follow the instructions displayed.

NOTE:

If the engine speed cannot be maintained within the range displayed on the CONSULT-III screen, go to EC-577, "BASIC INSPECTION: Special Repair Requirement".

Which is displayed on CONSULT-III screen?

OK >> INSPECTION END

NG >> GO TO 3.

3. CHECK DTC

Check DTC.

Which DTC is detected?

P0455 >> Go to <u>EC-925</u>, "<u>Diagnosis Procedure</u>". P0442 >> Go to <u>EC-888</u>, "<u>Diagnosis Procedure</u>".

4. PERFORM DTC CONFIRMATION PROCEDURE

With GST

NOTE:

Be sure to read the explanation of Driving Pattern in <u>EC-1177</u>, "How to <u>Set SRT Code"</u> before driving vehicle.

- Start engine.
- 2. Drive vehicle according to Driving Pattern.
- Stop vehicle.
- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Turn ignition switch ON.
- 6. Turn ignition switch OFF and wait at least 10 seconds.
- 7. Turn ignition switch ON.
- 8. Check 1st trip DTC.

Is 1st trip DTC detected?

YES-1 >> P0455: Go to <u>EC-925</u>, "<u>Diagnosis Procedure</u>". YES-2 >> P0442: Go to <u>EC-888</u>, "<u>Diagnosis Procedure</u>". YES-3 >> P0441: Go to <u>EC-884</u>, "<u>Diagnosis Procedure</u>". NO >> INSPECTION END

Revision: 2009 March EC-924 2009 FX35/FX50

[VK50VE]

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Diagnosis Procedure

INFOID:0000000003958841

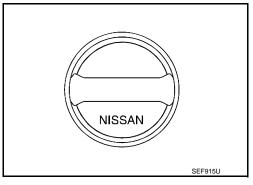
1. CHECK FUEL FILLER CAP DESIGN

- Turn ignition switch OFF.
- 2. Check for genuine NISSAN fuel filler cap design.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace with genuine NISSAN fuel filler cap.



2.CHECK FUEL FILLER CAP INSTALLATION

Check that the cap is tightened properly by rotating the cap clockwise.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Open fuel filler cap, then clean cap and fuel filler neck threads using air blower. Retighten until ratcheting sound is heard.

3.CHECK FUEL FILLER CAP FUNCTION

Check for air releasing sound while opening the fuel filler cap.

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

f 4.CHECK FUEL TANK VACUUM RELIEF VALVE

Refer to EC-927, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 5.

>> Replace fuel filler cap with a genuine one. NO

${f 5}.$ CHECK EVAP PURGE LINE

Check EVAP purge line (pipe, rubber tube, fuel tank and EVAP canister) for cracks, improper connection or disconnection.

Refer to EC-654, "System Description".

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or reconnect the hose.

6. CLEAN EVAP PURGE LINE

Clean EVAP purge line (pipe and rubber tube) using air blower.

>> GO TO 7.

7.CHECK EVAP CANISTER VENT CONTROL VALVE

Check the following.

EVAP canister vent control valve is installed properly.

Refer to EC-1231, "Removal and Installation".

EVAP canister vent control valve.

Refer to EC-903, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace EVAP canister vent control valve and O-ring.

EC-925 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

F

K

M

Ν

< DTC/CIRCUIT DIAGNOSIS >

8. CHECK FOR EVAP LEAK

Refer to EC-1229, "Inspection".

Is there any leak in EVAP line?

YES >> Repair or replace malfunctioning part.

NO-1 >> With CONSULT-III: GO TO 9.

NO-2 >> Without CONSULT-III: GO TO 10.

9.CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

(P) With CONSULT-III

- 1. Disconnect vacuum hose from EVAP canister purge volume control solenoid valve at EVAP service port.
- Start engine and let it idle.
- Select "PURG VOL CONT/V" in "ACTIVE TEST" mode.
- 4. Touch "Qu" on CONSULT-III screen to increase "PURG VOL C/V" opening to 100%.
- Check vacuum hose for vacuum.

Vacuum should exist.

Is the inspection result normal?

YES >> GO TO 12. NO >> GO TO 11.

10.check evap canister purge volume control solenoid valve operation

Without CONSULT-III

- 1. Start engine and warm it up to normal operating temperature.
- 2. Stop engine.
- 3. Disconnect vacuum hose from EVAP canister purge volume control solenoid valve at EVAP service port.
- 4. Start engine and let it idle for at least 80 seconds.
- 5. Check vacuum hose for vacuum when revving engine up to 2,000 rpm.

Vacuum should exist.

Is the inspection result normal?

YES >> GO TO 13. NO >> GO TO 11.

11. CHECK VACUUM HOSE

Check vacuum hoses for clogging or disconnection. Refer to EC-654, "System Description".

Is the inspection result normal?

YES-1 >> With CONSULT-III: GO TO 12.

YES-2 >> Without CONSULT-III: GO TO 13.

NO >> Repair or reconnect the hose.

12. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

(II) With CONSULT-III

- 1. Start engine.
- Perform "PURG VOL CONT/V" in "ACTIVE TEST" mode with CONSULT-III. Check that engine speed varies according to the valve opening.

Does engine speed vary according to the valve opening?

YES >> GO TO 14. NO >> GO TO 13.

13. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-896, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 14.

NO >> Replace EVAP canister purge volume control solenoid valve.

14. CHECK FUEL TANK TEMPERATURE SENSOR

[VK50VE] < DTC/CIRCUIT DIAGNOSIS > Refer to EC-844, "Component Inspection". Is the inspection result normal? YES >> GO TO 15. >> Replace "fuel level sensor unit and fuel pump (main)". NO

15. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-911, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 16.

>> Replace EVAP control system pressure sensor. NO

16. CHECK EVAP/ORVR LINE

Check EVAP/ORVR line between EVAP canister and fuel tank for clogging, kinks, looseness and improper connection. For location, refer to EC-1116, "Description".

Is the inspection result normal?

YES >> GO TO 17.

NO >> Repair or replace hoses and tubes.

17. CHECK RECIRCULATION LINE

Check recirculation line between filler neck tube and fuel tank for clogging, kinks, cracks, looseness and improper connection.

Is the inspection result normal?

YES >> GO TO 18.

NO >> Repair or replace hose, tube or filler neck tube.

18.CHECK REFUELING EVAP VAPOR CUT VALVE

Refer to EC-1119, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 19.

NO >> Replace refueling EVAP vapor cut valve with fuel tank.

19. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

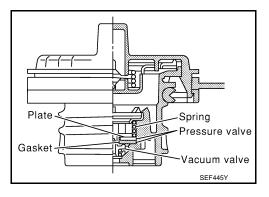
Component Inspection

1.CHECK FUEL FILLER CAP

- Turn ignition switch OFF.
- 2. Remove fuel filler cap.

Revision: 2009 March

Wipe clean valve housing.



EC

Α

D

F

Е

Н

INFOID:0000000004032242

K

M

Ν

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

4. Install fuel filler cap adapter (commercial service tool) to fuel filler cap.

5. Check valve opening pressure and vacuum.

Pressure: 15.3 - 20.0 kPa (0.156 - 0.204 kg/cm², 2.22 -

2.90 psi)

Vacuum: -6.0 to -3.3 kPa (-0.061 to -0.034 kg/cm²,

-0.87 to -0.48 psi)

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

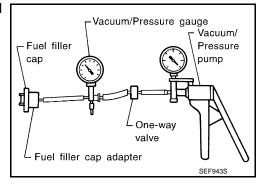
2.REPLACE FUEL FILLER CAP

Replace fuel filler cap.

CAUTION:

Use only a genuine fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the MIL may illuminate.

>> INSPECTION END



[VK50VE]

Α

EC

D

Е

F

P0456 EVAP CONTROL SYSTEM

DTC Logic

DTC DETECTION LOGIC

NOTE:

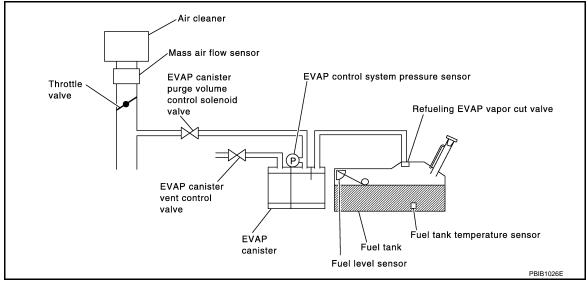
If DTC P0456 is displayed with DTC P0442, first perform the trouble diagnosis for DTC P0456. Refer to <u>EC-929, "DTC Logic"</u>.

This diagnosis detects very small leaks in the EVAP line between fuel tank and EVAP canister purge volume control solenoid valve, using the intake manifold vacuum in the same way as conventional EVAP small leak diagnosis.

If ECM judges a leak which corresponds to a very small leak, the very small leak P0456 will be detected.

If ECM judges a leak equivalent to a small leak, EVAP small leak P0442 will be detected.

If ECM judges that there are no leaks, the diagnosis will be OK.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0456	Evaporative emission control system very small leak (negative pressure check)	EVAP system has a very small leak. EVAP system does not operate properly.	 Incorrect fuel tank vacuum relief valve Incorrect fuel filler cap used Fuel filler cap remains open or does not close. Foreign matter caught in fuel filler cap. Leak is in line between intake manifold and EVAP canister purge volume control solenoid valve. Foreign matter caught in EVAP canister vent control valve. EVAP canister or fuel tank leaks EVAP purge line (pipe and rubber tube) leaks EVAP purge line rubber tube bent Loose or disconnected rubber tube EVAP canister vent control valve and the circuit EVAP canister purge volume control solenoid valve and the circuit Fuel tank temperature sensor O-ring of EVAP canister vent control valve is missing or damaged EVAP canister is saturated with water EVAP control system pressure sensor Refueling EVAP vapor cut valve ORVR system leaks Fuel level sensor and the circuit Foreign matter caught in EVAP canister purge volume control solenoid valve

CAUTION:

< DTC/CIRCUIT DIAGNOSIS >

- Use only a genuine NISSAN fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the MIL may illuminate.
- If the fuel filler cap is not tightened properly, the MIL may illuminate.
- Use only a genuine NISSAN rubber tube as a replacement.

DTC CONFIRMATION PROCEDURE

1.INSPECTION START

Will CONSULT-III be used?

Will CONSULT-III be used?

YES >> GO TO 2.

NO >> GO TO 4.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

NOTE:

After repair, check that the hoses and clips are installed properly.

TESTING CONDITION:

- Open engine hood before conducting the following procedure.
- If any of following conditions are met just before the DTC confirmation procedure, leave the vehicle for more than 1 hour.
- Fuel filler cap is removed.
- Fuel is refilled or drained.
- EVAP component part/parts is/are removed.
- Before performing the following procedure, confirm that battery voltage is more than 11 V at idle.
- Check that EVAP hoses are connected to EVAP canister purge volume control solenoid valve properly.

>> GO TO 3.

3. PERFORM DTC CONFIRMATION PROCEDURE

(P) With CONSULT-III

- 1. Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-III.
- 2. Check that the following conditions are met.

FUEL LEVEL SE: 0.25 - 1.4 V

COOLAN TEMP/S: 0 - 32°C (32 - 90°F) FUEL T/TMP SE: 0 - 35°C (32 - 95°F) INT A/TEMP SE: More than 0°C (32°F)

If NG, turn ignition switch OFF and leave the vehicle in a cool place (soak the vehicle), or refill/drain fuel until the output voltage of the "FUEL LEVEL SE" meets within the range above and leave the vehicle for more than 1 hour. Then start from step 1.

- 3. Turn ignition switch OFF and wait at least 10 seconds.
- 4. Turn ignition switch ON.
- Select "EVP V/S LEAK P0456/P1456" of "EVAPORATIVE SYSTEM" in "DTC WORK SUPPORT" mode with CONSULT-III.

Follow the instructions displayed.

NOTE:

If the engine speed cannot be maintained within the range displayed on CONSULT-III screen, go to <u>EC-577</u>, "BASIC INSPECTION: Special Repair Requirement".

Which is displayed on CONSULT-III screen?

OK >> INSPECTION END

NG >> Go to EC-931, "Diagnosis Procedure".

4.PERFORM COMPONENT FUNCTION CHECK

With GST

Perform Component Function Check. Refer to EC-931, "Component Function Check".

Revision: 2009 March **EC-930** 2009 FX35/FX50

< DTC/CIRCUIT DIAGNOSIS >

NOTE:

Use Component Function Check to check the overall function of the EVAP very small leak function. During this check, a 1st trip DTC might not be confirmed.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-931, "Diagnosis Procedure".

Component Function Check

INFOID:0000000003958844

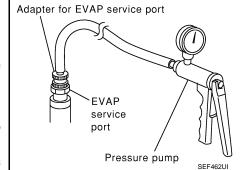
[VK50VE]

1. PERFORM COMPONENT FUNCTION CHECK

With GST CAUTION:

- Never use compressed air, doing so may damage the EVAP system.
- · Never start engine.
- Never exceed 4.12 kPa (0.042 kg/cm², 0.6 psi).
- 1. Attach the EVAP service port adapter securely to the EVAP service port (commercial service tool).
- 2. Set the pressure pump and a hose.
- 3. Also set a vacuum gauge via 3-way connector and a hose.
- 4. Turn ignition switch ON.
- Connect GST and select Service \$08.
- 6. Using Service \$08 control the EVAP canister vent control valve (close).
- 7. Apply pressure and check the following conditions are satisfied.

Pressure to be applied: 2.7 kPa (0.028 kg/cm², 0.39 psi) Time to be waited after the pressure drawn in to the EVAP system and the pressure to be dropped: 60 seconds and the pressure should not be dropped more than 0.4 kPa (0.004 kg/cm², 0.06 psi).



Is the inspection result normal?

YES >> GO TO 2.

NO >> Go to <u>EC-931</u>, "<u>Diagnosis Procedure</u>".

2. RELEASE PRESSURE

- 1. Disconnect GST.
- 2. Start engine and warm it up to normal operating temperature.
- 3. Turn ignition switch OFF and wait at least 10 seconds.
- 4. Restart engine and let it idle for 90 seconds.
- 5. Keep engine speed at 2,000 rpm for 30 seconds.
- 6. Turn ignition switch OFF.

NOTE:

For more information, refer to GST Instruction Manual.

INFOID:0000000003958845

>> INSPECTION END

Diagnosis Procedure

1. CHECK FUEL FILLER CAP DESIGN

Turn ignition switch OFF.

Ρ

Revision: 2009 March EC-931 2009 FX35/FX50

EC

EC

D

Е

F

G

. .

Κ

M

N

0

< DTC/CIRCUIT DIAGNOSIS >

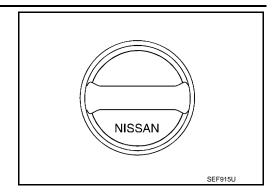
[VK50VE]

2. Check for genuine NISSAN fuel filler cap design.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace with genuine NISSAN fuel filler cap.



2. CHECK FUEL FILLER CAP INSTALLATION

Check that the cap is tightened properly by rotating the cap clockwise.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Open fuel filler cap, then clean cap and fuel filler neck threads using air blower. Retighten until ratcheting sound is heard.

3.CHECK FUEL FILLER CAP FUNCTION

Check for air releasing sound while opening the fuel filler cap.

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4. CHECK FUEL TANK VACUUM RELIEF VALVE

Refer to EC-935, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace fuel filler cap with a genuine one.

5.CHECK FOR EVAP LEAK

Refer to EC-1229, "Inspection".

Is there any leak in EVAP line?

YES >> Repair or replace malfunctioning part.

NO >> GO TO 6.

6.CHECK EVAP CANISTER VENT CONTROL VALVE

Check the following.

EVAP canister vent control valve is installed properly.

Refer to EC-1231, "Removal and Installation".

EVAP canister vent control valve

Refer to EC-903, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace EVAP canister vent control valve and O-ring.

.CHECK IF EVAP CANISTER IS SATURATED WITH WATER

 Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

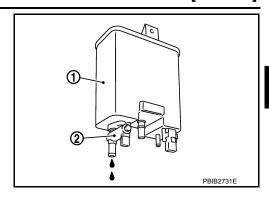
- Check if water will drain from EVAP canister (1).
- EVAP canister vent control valve (2)

Does water drain from the EVAP canister?

>> GO TO 8.

NO-1 >> With CONSULT-III: GO TO 10.

NO-2 >> Without CONSULT-III: GO TO 11.



8. CHECK EVAP CANISTER

Weigh the EVAP canister with the EVAP canister vent control valve and EVAP control system pressure sensor

The weight should be less than 2.1 kg (4.6 lb).

Is the inspection result normal?

YES-1 >> With CONSULT-III: GO TO 10.

YES-2 >> Without CONSULT-III: GO TO 11.

>> GO TO 9. NO

9. DETECT MALFUNCTIONING PART

Check the following.

- EVAP canister for damage
- EVAP hose between EVAP canister and vehicle frame for clogging or poor connection

>> Repair hose or replace EVAP canister.

10.check evap canister purge volume control solenoid valve operation

With CONSULT-III

- 1. Disconnect vacuum hose from EVAP canister purge volume control solenoid valve at EVAP service port.
- 2. Start engine and let it idle.
- 3. Select "PURG VOL CONT/V" in "ACTIVE TEST" mode.
- Touch "Qu" on CONSULT-III screen to increase "PURG VOL C/V" opening to 100%.
- Check vacuum hose for vacuum.

Vacuum should exist.

Is the inspection result normal?

YES >> GO TO 13.

NO >> GO TO 12.

11.CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

Without CONSULT-III

- 1. Start engine and warm it up to normal operating temperature.
- Stop engine.
- Disconnect vacuum hose from EVAP canister purge volume control solenoid valve at EVAP service port.
- 4. Start engine and let it idle for at least 80 seconds.
- 5. Check vacuum hose for vacuum when revving engine up to 2,000 rpm.

Vacuum should exist.

Is the inspection result normal?

YES >> GO TO 14.

NO >> GO TO 12.

12. CHECK VACUUM HOSE

Check vacuum hoses for clogging or disconnection. Refer to EC-654, "System Description". Is the inspection result normal?

EC-933 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

F

Н

M

N

Р

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

YES >> GO TO 13.

NO >> Repair or reconnect the hose.

13. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-896, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 14.

NO >> Replace EVAP canister purge volume control solenoid valve.

14. CHECK FUEL TANK TEMPERATURE SENSOR

Refer to EC-844. "Component Inspection".

Is the inspection result normal?

YES >> GO TO 15.

NO >> Replace "fuel level sensor unit and fuel pump (main)".

15. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-911, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 16.

NO >> Replace EVAP control system pressure sensor.

16. CHECK EVAP PURGE LINE

Check EVAP purge line (pipe, rubber tube, fuel tank and EVAP canister) for cracks or improper connection. Refer to <u>EC-654</u>, "System Description".

Is the inspection result normal?

YES >> GO TO 17.

NO >> Repair or reconnect the hose.

17. CLEAN EVAP PURGE LINE

Clean EVAP purge line (pipe and rubber tube) using air blower.

>> GO TO 18.

18. CHECK EVAP/ORVR LINE

Check EVAP/ORVR line between EVAP canister and fuel tank for clogging, kinks, looseness and improper connection. For location, refer to EC-1116, "Description".

Is the inspection result normal?

YES >> GO TO 19.

NO >> Repair or replace hoses and tubes.

19. CHECK RECIRCULATION LINE

Check recirculation line between filler neck tube and fuel tank for clogging, kinks, cracks, looseness and improper connection.

Is the inspection result normal?

YES >> GO TO 20.

NO >> Repair or replace hose, tube or filler neck tube.

20. CHECK REFUELING EVAP VAPOR CUT VALVE

Refer to MWI-63, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 21.

NO >> Replace refueling EVAP vapor cut valve with fuel tank.

21. CHECK FUEL LEVEL SENSOR

Refer to MWI-63, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 22.

Revision: 2009 March **EC-934** 2009 FX35/FX50

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

>> Replace "fuel level sensor unit and fuel pump (main)". NO

22. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000004032243

Vacuum/

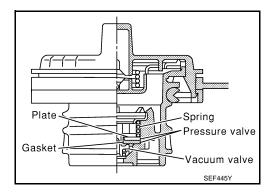
Pressure

pump

SEF943S

1. CHECK FUEL FILLER CAP

- Turn ignition switch OFF.
- 2. Remove fuel filler cap.
- 3. Wipe clean valve housing.



-Vacuum/Pressure gauge

One-way

valve

-Fuel filler

- Fuel filler cap adapter

cap

Install fuel filler cap adapter (commercial service tool) to fuel filler cap.

Check valve opening pressure and vacuum.

Pressure: 15.3 - 20.0 kPa (0.156 - 0.204 kg/cm², 2.22 -

2.90 psi)

Vacuum: -6.0 to -3.3 kPa (-0.061 to -0.034 kg/cm²,

-0.87 to -0.48 psi)

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2. 2.REPLACE FUEL FILLER CAP

Replace fuel filler cap.

CAUTION:

Use only a genuine fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the MIL may illuminate.

>> INSPECTION END

M

EC

Α

C

D

Е

F

Н

K

L

Ν

Р

P0460 FUEL LEVEL SENSOR

Description

The fuel level sensor is mounted in the fuel level sensor unit.

The sensor detects a fuel level in the fuel tank and transmits a signal to the "unified meter and A/C amp.". The "unified meter and A/C amp." sends the fuel level sensor signal to the ECM through the CAN communication line

It consists of two parts, one is mechanical float and the other is variable resistor. Fuel level sensor output voltage changes depending on the movement of the fuel mechanical float.

DTC Logic

DTC DETECTION LOGIC

NOTE:

- If DTC P0460 is displayed with DTC UXXXX, first perform the trouble diagnosis for DTC UXXXX.
- If DTC P0460 is displayed with DTC P0607, first perform the trouble diagnosis for DTC P0607. Refer to EC-958, "DTC Logic".

When the vehicle is parked, the fuel level in the fuel tank is naturally stable. It means that output signal of the fuel level sensor does not change. If ECM senses sloshing signal from the sensor, fuel level sensor malfunction is detected.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0460	Fuel level sensor circuit noise	Even though the vehicle is parked, a signal being varied is sent from the fuel level sensor to ECM.	 Harness or connectors (The CAN communication line is open or shorted) Harness or connectors (The sensor circuit is open or shorted) Unified meter and A/C amp. Fuel level sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine and wait maximum of 2 consecutive minutes.
- 2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-936, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003958849

1.CHECK DTC WITH "UNIFIED METER AND A/C AMP."

Refer to MWI-45, "CONSULT-III Function (METER/M&A)".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Go to MWI-62, "Diagnosis Procedure".

2.CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

P0460 FUEL LEVEL SENSOR

< DTC/CIRCUIT DIAGNOSIS > [VK50VE]

>> INSPECTION END

EC

D

Е

F

G

Н

1

J

Κ

L

 \mathbb{N}

Ν

0

Ρ

P0461 FUEL LEVEL SENSOR

Description INFOID:000000004032244

The fuel level sensor is mounted in the fuel level sensor unit.

The sensor detects a fuel level in the fuel tank and transmits a signal to the "unified meter and A/C amp.". The "unified meter and A/C amp." sends the fuel level sensor signal to the ECM through the CAN communication line

It consists of two parts, one is mechanical float and the other is variable resistor. Fuel level sensor output voltage changes depending on the movement of the fuel mechanical float.

DTC Logic

DTC DETECTION LOGIC

NOTE:

- If DTC P0461 is displayed with DTC UXXXX, first perform the trouble diagnosis for DTC UXXXX.
- If DTC P0461 is displayed with DTC P0607, first perform the trouble diagnosis for DTC P0607. Refer to EC-958, "DTC Logic".

Driving long distances naturally affect fuel gauge level.

This diagnosis detects the fuel gauge malfunction of the gauge not moving even after a long distance has been driven.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0461	Fuel level sensor circuit range/performance	The output signal of the fuel level sensor does not change within the specified range even though the vehicle has been driven a long distance.	Harness or connectors (The CAN communication line is open or shorted) Harness or connectors (The sensor circuit is open or shorted) Unified meter and A/C amp. Fuel level sensor

DTC CONFIRMATION PROCEDURE

1. PERFORM COMPONENT FUNCTION CHECK

Perform Component Function Check. Refer to EC-938, "Component Function Check".

Use component function check to check the overall function of the fuel level sensor. During this check, a 1st trip DTC might not be confirmed.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-939, "Diagnosis Procedure".

Component Function Check

INFOID:0000000003958852

1.PRECONDITIONING

WARNING:

When performing the following procedure, always observe the handling of the fuel. Refer to <u>FL-10</u>, <u>"Removal and Installation"</u>.

TESTING CONDITION:

Before starting component function check, preparation of draining fuel and refilling fuel is required.

>> GO TO 2.

2. PERFORM COMPONENT FUNCTION CHECK

NOTE:

Start from step 8, if it is possible to confirm that the fuel cannot be drained by 30 $\,\ell$ (7-7/8 US gal, 6-5/8 Imp gal) in advance.

- Prepare a fuel container and a spare hose.
- Release fuel pressure from fuel line. Refer to <u>EC-1228, "Inspection"</u>.

Revision: 2009 March EC-938 2009 FX35/FX50

P0461 FUEL LEVEL SENSOR

P0461 FUEL LEVEL SENSOR		
< DTC/CIRCUIT DIAGNOSIS >	[VK50VE]	
 Remove the fuel feed hose on the fuel level sensor unit. Connect a spare fuel hose where the fuel feed hose was removed. Turn ignition switch ON. 		А
 6. Drain fuel by 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal) from the fuel tank using proper equipment. 7. Confirm that the fuel gauge indication varies. 8. Fill fuel into the fuel tank for 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal). 9. Confirm that the fuel gauge indication varies. 		EC
Is the inspection result normal? YES >> INSPECTION END NO >> Go to EC-939, "Diagnosis Procedure".		С
Diagnosis Procedure	INFOID:0000000003958853	D
1. CHECK DTC WITH "UNIFIED METER AND A/C AMP."		
Refer to MWI-45, "CONSULT-III Function (METER/M&A)".		Е
Is the inspection result normal? YES >> GO TO 2.		
NO >> Go to MWI-62, "Diagnosis Procedure".		F
2.CHECK INTERMITTENT INCIDENT Refer to GI-35, "Intermittent Incident".	_	
		G
>> INSPECTION END		Н
		I
		J
		1.6
		K
		L
		\mathbb{M}
		Ν
		0
		Р

Revision: 2009 March **EC-939** 2009 FX35/FX50

P0462, P0463 FUEL LEVEL SENSOR

Description INFOID:000000004032245

The fuel level sensor is mounted in the fuel level sensor unit.

The sensor detects a fuel level in the fuel tank and transmits a signal to the "unified meter and A/C amp.". The "unified meter and A/C amp." sends the fuel level sensor signal to the ECM through the CAN communication line.

It consists of two parts, one is mechanical float and the other is variable resistor. Fuel level sensor output voltage changes depending on the movement of the fuel mechanical float.

DTC Logic

DTC DETECTION LOGIC

NOTE:

- If DTC P0462 or P0463 is displayed with DTC UXXXX, first perform the trouble diagnosis for DTC UXXXX.
- If DTC P0462 or P0463 is displayed with DTC P0607, first perform the trouble diagnosis for DTC P0607.Refer to <u>EC-958</u>, "DTC Logic".

This diagnosis indicates the former, to detect open or short circuit malfunction.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0462	Fuel level sensor circuit low input	An excessively low voltage from the sensor is sent to ECM.	Harness or connectors (The CAN communication line is open or shorted)
P0463	Fuel level sensor circuit high input	An excessively high voltage from the sensor is sent to ECM.	 Harness or connectors (The sensor circuit is open or shorted) Unified meter and A/C amp. Fuel level sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 11 V at ignition switch ON.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Turn ignition switch ON and wait at least 5 seconds.
- 2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-940, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003958856

1. CHECK DTC WITH "UNIFIED METER AND A/C AMP."

Refer to MWI-45, "CONSULT-III Function (METER/M&A)".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Go to MWI-62, "Diagnosis Procedure".

2.CHECK INTERMITTENT INCIDENT

P0462, P0463 FUEL LEVEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

EC

Α

D

Е

F

G

Н

Κ

L

M

Ν

0

Ρ

P0500 VSS

Description

The vehicle speed signal is sent to the "unified meter and A/C amp." from the "ABS actuator and electric unit (control unit)" by CAN communication line. The "unified meter and A/C amp." then sends a signal to the ECM by CAN communication line.

DTC Logic

DTC DETECTION LOGIC

NOTE:

- If DTC P0500 is displayed with DTC UXXXX, first perform the trouble diagnosis for DTC UXXXX.
- If DTC P0500 is displayed with DTC P0607, first perform the trouble diagnosis for DTC P0607. Refer to EC-958, "DTC Logic".

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0500	Vehicle speed sensor	The vehicle speed signal sent to ECM is almost 0 km/h (0 MPH) even when vehicle is being driven.	Harness or connectors (The CAN communication line is open or shorted) Harness or connectors (The vehicle speed signal circuit is open or shorted) Wheel sensor Unified meter and A/C amp. ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.INSPECTION START

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

Will CONSULT-III be used?

YES >> GO TO 2. NO >> GO TO 4.

2. CHECK VEHICLE SPEED SIGNAL

NOTE:

This procedure may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

- (P) With CONSULT-III
- Start engine (VDC switch OFF).
- Read "VHCL SPEED SE" in "DATA MONITOR" mode with CONSULT-III.
 The vehicle speed on CONSULT-III should exceed 10 km/h (6 MPH) when rotating wheels with suitable gear position.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Go to EC-943, "Diagnosis Procedure".

3.PERFORM DTC CONFIRMATION PROCEDURE

- 1. Select "DATA MONITOR" mode with CONSULT-III.
- 2. Warm engine up to normal operating temperature.
- Maintain the following conditions for at least 50 consecutive seconds. CAUTION:

Always drive vehicle at a safe speed.

ENG SPEED	More than 1,500 rpm
COOLAN TEMP/S	More than 70°C (158°F)

P0500 VSS

< DTC/CIRCUI	T DIAGNOSIS >	[VK50VE]
B/FUEL SCHDL	5.5 - 31.8 msec	
Selector lever	Except P or N position	
PW/ST SIGNAL	OFF	•
4. Check 1st ti	rip DTC.	
s 1st trip DTC o		
	to <u>EC-943, "Diagnosis Procedure"</u> . PECTION END	
4	COMPONENT FUNCTION CHECK	
_	JOINT GIVEN I GIVETION GILLOR	
With GST Perform Compo	nent Function Check. Refer to EC-943, "Component Function Check".	
Use Component	t Function Check to check the overall function of the vehicle speed s	ignal circuit. During this
•	DTC might not be confirmed.	
s the inspection		
	PECTION END to EC-943, "Diagnosis Procedure".	
Jomponent	Function Check	INFOID:0000000003958859
PERFORM C	COMPONENT FUNCTION CHECK	
With GST		
Lift up drive	wheels.	
2. Start engine		
	e speed signal in Service \$01 with GST. speed signal on GST should be able to exceed 10 km/h (6 MPH) wh	nen rotating wheels with
suitable gea		ion retaining introduction
s the inspection	result normal?	
	PECTION END	
NO >> Go	to <u>EC-943, "Diagnosis Procedure"</u> .	
Diagnosis Pr	ocedure	INFOID:000000003958860
1.CHECK DTC	WITH "ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)"	
	4, "CONSULT-III Function".	
	result normal?	
YES >> GO	TO 2.	
_ '	pair or replace malfunctioning part.	
∠.CHECK DTC	WITH "UNIFIED METER AND A/C AMP."	
Refer to MWI-45	5, "CONSULT-III Function (METER/M&A)".	
13.10	DECTION END	
>> INS	PECTION END	

Revision: 2009 March **EC-943** 2009 FX35/FX50

P0506 ISC SYSTEM

Description

The ECM controls the engine idle speed to a specified level through the fine adjustment of the air, which is let into the intake manifold, by operating the electric throttle control actuator. The operating of the throttle valve is varied to allow for optimum control of the engine idling speed. The crankshaft position sensor detects the actual engine speed and sends a signal to the ECM.

The ECM controls the electric throttle control actuator so that the engine speed coincides with the target value memorized in the ECM. The target engine speed is the lowest speed at which the engine can operate steadily. The optimum value stored in the ECM is determined by taking into consideration various engine conditions, such as during warming up, deceleration and engine load (air conditioner, power steering and cooling fan operation, etc.).

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P0506 is displayed with other DTC, first perform the trouble diagnosis for the other DTC.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0506	Idle speed control system RPM lower than expected	The idle speed is less than the target idle speed by 100 rpm or more.	Electric throttle control actuator Intake air leakage

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

If the target idle speed is out of the specified value, perform <u>EC-583</u>, "IDLE AIR VOLUME LEARNING: <u>Special Repair Requirement"</u>, before conducting DTC Confirmation Procedure.

TESTING CONDITION:

- Before performing the following procedure, confirm that battery voltage is more than 11 V at idle.
- Always perform the test at a temperature above –10°C (14°F).

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine and warm it up to normal operating temperature.
- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Restart engine and run it for at least 1 minute at idle speed.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-944, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003958863

1. CHECK INTAKE AIR LEAKAGE

- Start engine and let it idle.
- Listen for an intake air leakage after the mass air flow sensor.

Is intake air leakage detected?

YES >> Discover air leakage location and repair.

P0506 ISC SYSTEM [VK50VE] < DTC/CIRCUIT DIAGNOSIS > NO >> GO TO 2. 2.REPLACE ECM Α Stop engine. 2. Replace ECM. EC Perform EC-580, "ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT (ECM): Special Repair Requirement". С >> INSPECTION END D Е F G Н Κ L M Ν 0

Revision: 2009 March EC-945 2009 FX35/FX50

Р

P0507 ISC SYSTEM

Description

The ECM controls the engine idle speed to a specified level through the fine adjustment of the air, which is let into the intake manifold, by operating the electric throttle control actuator. The operating of the throttle valve is varied to allow for optimum control of the engine idling speed. The crankshaft position sensor detects the actual engine speed and sends a signal to the ECM.

The ECM controls the electric throttle control actuator so that the engine speed coincides with the target value memorized in the ECM. The target engine speed is the lowest speed at which the engine can operate steadily. The optimum value stored in the ECM is determined by taking into consideration various engine conditions, such as during warming up, deceleration and engine load (air conditioner, power steering and cooling fan operation, etc.).

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P0507 is displayed with other DTC, first perform the trouble diagnosis for the other DTC.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0507	Idle speed control system RPM higher than expected	The idle speed is more than the target idle speed by 200 rpm or more.	Electric throttle control actuator Intake air leakage PCV system

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

If the target idle speed is out of the specified value, perform <u>EC-583, "IDLE AIR VOLUME LEARNING: Special Repair Requirement"</u>, before conducting DTC Confirmation Procedure.

TESTING CONDITION:

- Before performing the following procedure, confirm that battery voltage is more than 11 V at idle.
- Always perform the test at a temperature above –10°C (14°F).

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine and warm it up to normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.
- 5. Start engine and run it for at least 1 minute at idle speed.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-946, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003958866

1. CHECK PCV HOSE CONNECTION

Confirm that PCV hose is connected correctly.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace malfunctioning part.

Revision: 2009 March EC-946 2009 FX35/FX50

P0507 ISC SYSTEM [VK50VE] < DTC/CIRCUIT DIAGNOSIS > 2.CHECK INTAKE AIR LEAKAGE Α 1. Start engine and let it idle. Listen for an intake air leakage after the mass air flow sensor. Is intake air leakage detected? EC >> Discover air leakage location and repair. NO >> GO TO 3. 3.REPLACE ECM 1. Stop engine. 2. Replace ECM. Perform EC-580, "ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT (ECM): Special Repair D Requirement". Е >> INSPECTION END F Н K L M

Revision: 2009 March EC-947 2009 FX35/FX50

Ν

0

Р

P0524 ENGINE OIL PRESSURE

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P0524 is displayed with DTC P0075 or P0081, first perform the trouble diagnosis for DTC P0075, P0081. Refer to EC-762, "DTC Logic".

DTC No.	Trouble diagnosis name	Detecting condition	Possible cause
P0524	Engine oil pressure too low	Engine oil pressure is low because there is a gap between angle of target and phase-control angle.	Engine oil pressure or level too low Crankshaft position sensor Camshaft position sensor Intake valve timing control solenoid valve Accumulation of debris to the signal pick-up portion of the camshaft Timing chain installation Foreign matter caught in the oil groove for intake valve timing control

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING-I

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is between 10 V and 16 V at idle.

>> GO TO 2.

2.PRECONDITIONING-II

Check oil level and oil pressure. Refer to LU-25, "Inspection".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Go to LU-25, "Inspection".

3. PERFORM DTC CONFIRMATION PROCEDURE

- (P) With CONSULT-III
- 1. Select "DATA MONITOR" mode with CONSULT-III.
- Maintain the following conditions for at least 20 consecutive seconds.

ENG SPEED	More than 1,700 rpm
COOLAN TEMP/S	More than 70°C (158°F)
Selector lever	1st or 2nd position
Driving location uphill	Driving vehicle uphill (Increased engine load will help maintain the driving conditions required for this test.)

CAUTION:

Always drive at a safe speed.

- 3. Check 1st trip DTC.
- With GST

Follow the procedure "With CONSULT-III" above.

Is 1st trip DTC detected?

P0524 ENGINE OIL PRESSURE

< DTC/CIRCUIT DIAGNOSIS >

YES >> Go to <u>EC-949</u>, "<u>Diagnosis Procedure</u>"

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003959721

[VK50VE]

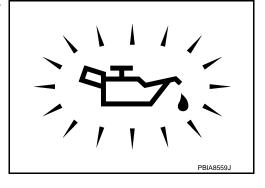
1. CHECK OIL PRESSURE WARNING LAMP

- Start engine.
- Check oil pressure warning lamp and confirm it is not illuminated.

Is oil pressure warning lamp illuminated?

YES >> Go to <u>LU-25</u>, "Inspection".

NO >> GO TO 2.



2. CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE

Refer to EC-763, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace malfunctioning intake valve timing control solenoid valve.

3. CHECK CRANKSHAFT POSITION SENSOR

Refer to EC-870, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace crankshaft position sensor.

4. CHECK CAMSHAFT POSITION SENSOR

Refer to EC-875, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace malfunctioning camshaft position sensor.

5. CHECK CAMSHAFT (INTAKE)

Check the following.

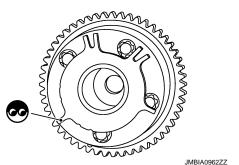
- Accumulation of debris to the signal plate of camshaft front end
- Chipping signal plate of camshaft front end

Is the inspection result normal?

YES >> GO TO 6.

NO >> Remove debris and clean the signal plate of camshaft front end or replace camshaft.

ımshaft



6. CHECK TIMING CHAIN INSTALLATION

Check service records for any recent repairs that may cause timing chain misaligned.

Are there any service records that may cause timing chain misaligned?

YES >> Check timing chain installation. Refer to EM-213, "Disassembly and Assembly".

NO >> GO TO 7.

7.CHECK LUBRICATION CIRCUIT

F

D

Е

Α

EC

Н

J

. .

M

Ν

0

P

Revision: 2009 March EC-949 2009 FX35/FX50

P0524 ENGINE OIL PRESSURE

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Perform "Inspection of Camshaft Sprocket (INT) Oil Groove". Refer to <u>LU-25</u>, "<u>Inspection</u>". <u>Is the inspection result normal?</u>

YES >> GO TO 8.

NO >> Clean lubrication line.

8.CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

P0550 PSP SENSOR

Description INFOID:0000000003958867

Power steering pressure (PSP) sensor is installed to the power steering high-pressure tube and detects a power steering load.

This sensor is a potentiometer which transforms the power steering load into output voltage, and emits the voltage signal to the ECM. The ECM controls the electric throttle control actuator and adjusts the throttle valve opening angle to increase the engine speed and adjusts the idle speed for the increased load.

DTC Logic INFOID:0000000003958868

DTC DETECTION LOGIC

NOTE:

If DTC P0550 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. Refer to EC-959, "DTC Logic".

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0550	Power steering pressure sensor circuit	An excessively low or high voltage from the sensor is sent to ECM.	Harness or connectors (The sensor circuit is open or shorted) Power steering pressure sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- Start engine and let it idle for at least 5 seconds.
- 2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-951, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1. CHECK GROUND CONNECTION

- Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.check power steering pressure sensor power supply circuit

- Disconnect power steering pressure (PSP) sensor harness connector.
- Turn ignition switch ON. 2.
- Check the voltage between PSP sensor harness connector and ground. 3.

PSP sensor		Ground	Voltage (V)
Connector	Terminal	Giodila	voltage (v)
F35	3	Ground	Approx. 5

EC-951 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

INFOID:0000000003958869

M

N

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

3.check PSP sensor ground circuit for open and short

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check the continuity between PSP sensor harness connector and ECM harness connector.

PSP sensor		EC	Continuity	
Connector	Terminal	Connector	Terminal	Continuity
F35	1	F111	66	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit, short to ground short to power in harness or connectors.

4. CHECK PSP SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between PSP sensor harness connector and ECM harness connector.

PSP sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	Continuity
F35	2	F111	83	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

5. CHECK PSP SENSOR

Refer to EC-952, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace PSP sensor.

6. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000003958870

1. CHECK POWER STEERING PRESSURE SENSOR

- 1. Turn ignition switch OFF.
- 2. Reconnect all harness connectors disconnected.
- 3. Start engine and let it idle.
- 4. Check the voltage between ECM harness connector terminals under the following conditions.

	ECM				
Connector	+	_	Condition Voltage		Voltage (V)
Connector	Terminal	Terminal			
F111	83	66	Steering wheel	Being turned	0.5 - 4.5
	FTTT 65 00 Steeling wheel		Not being turned	0.4 - 0.8	

Is the inspection result normal?

P0550 PSP SENSOR

< DTC/CIRCUIT DIAGNOSIS > [VK50VE]

YES >> INSPECTION END

NO >> Replace power steering pressure sensor.

Α

EC

С

D

Е

F

G

Н

J

K

L

M

Ν

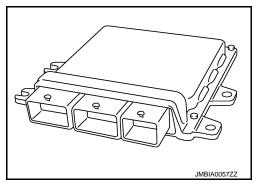
0

Ρ

P0603 ECM POWER SUPPLY

Description INFOID:000000003958871

Battery voltage is supplied to the ECM even when the ignition switch is turned OFF for the ECM memory function of the DTC memory, the air-fuel ratio feedback compensation value memory, the idle air volume learning value memory, etc.



DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0603	ECM power supply circuit	ECM back up RAM system does not function properly.	Harness or connectors [ECM power supply (back up) circuit is open or shorted.] ECM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Turn ignition switch ON and wait at least 1 second.
- Start engine and let it idle for 1 second.
- Turn ignition switch OFF, wait at least 10 seconds, and then turn it ON.
- 4. Repeat steps 2 and 3 for 4 times.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-954, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003958873

1. CHECK ECM POWER SUPPLY

- Turn ignition switch OFF.
- Disconnect ECM harness connector.
- 3. Check the voltage between ECM harness connector terminals under the following conditions.

P0603 ECM POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

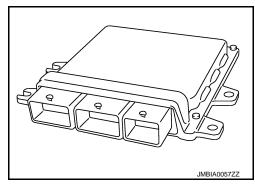
	E	CM				Α
-	+	-	=	Voltage	_	
Connector	Terminal	Connector	Terminal			EC
M160	118	M160	128	Battery voltage		
Is the inspe	ection result	t normal?				
NO >>	GO TO 3. GO TO 2.					С
2.DETECT	T MALFUN	CTIONING	PART			
Check the f • Harness o • 15 A fuse	connectors	M6, E106				D
IPDM E/FHarness f				nd battery		Е
3.CHECK	•	replace har		nnectors.		F
Refer to GI						0
Is the inspe						G
	GO TO 4.					
4		replace har				Н
4.PERFO			ION PROC	EDURE		
 Turn ig Erase I 	nition switc	h ON.				
Perform	n DTC Con	firmation P	ocedure.			
	C-954, "DTO	_	l: O			
Is the 1st tr	GO TO 5.	ous displaye	ed again?			J
	INSPECT	ION END				
5.REPLAC	CE ECM					K
1. Replac	e ECM.					
	EC-580, "A ement".	<u>DDITIONA</u>	_ SERVICE	WHEN REPLA	CING CONTROL UNIT (ECM) : Special Repair	L
>>	INSPECT	ION END				M
						Ν
						IN
						0
						Р

Revision: 2009 March **EC-955** 2009 FX35/FX50

P0605 ECM

Description INFOID:0000000003958874

The ECM consists of a microcomputer and connectors for signal input and output and for power supply. The ECM controls the engine.



DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition		Possible cause
		A)	ECM calculation function is malfunctioning.	
P0605	Engine control module	B)	ECM EEP-ROM system is malfunctioning.	• ECM
		C)	ECM self shut-off function is malfunctioning.	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION A

- 1. Turn ignition switch ON.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-957, "Diagnosis Procedure".

NO >> GO TO 3.

3.perform dtc confirmation procedure for malfunction b

- 1. Turn ignition switch ON and wait at least 1 second.
- 2. Turn ignition switch OFF, wait at least 10 seconds, and then turn it ON.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-957, "Diagnosis Procedure".

NO >> GO TO 4.

4. PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION C

- 1. Turn ignition switch ON and wait at least 1 second.
- 2. Turn ignition switch OFF, wait at least 10 seconds, and then turn it ON.
- Repeat step 2 for 32 times.
- Check 1st trip DTC.

Is 1st trip DTC detected?

P0605 ECM

[VK50VE] < DTC/CIRCUIT DIAGNOSIS > YES >> Go to EC-957, "Diagnosis Procedure". NO >> INSPECTION END Α Diagnosis Procedure INFOID:0000000003958876 1. INSPECTION START EC Turn ignition switch ON. Erase DTC. C 3. Perform DTC Confirmation Procedure. See EC-956, "DTC Logic". Is the 1st trip DTC P0605 displayed again? D YES >> GO TO 2. NO >> INSPECTION END 2.REPLACE ECM Е 1. Replace ECM. Go to EC-580, "ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT (ECM): Special Repair Requirement". F >> INSPECTION END Н K L M Ν 0 Р

EC-957 Revision: 2009 March 2009 FX35/FX50

P0607 ECM

Description INFOID:000000003958877

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name DTC detecting condition P		Possible cause
P0607	CAN communication bus	When detecting error during the initial diagnosis of CAN controller of ECM.	• ECM

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

- Turn ignition switch ON.
- Check DTC.

Is DTC detected?

YES >> Go to EC-958, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003958879

1. INSPECTION START

- 1. Turn ignition switch ON.
- 2. Erase DTC.
- 3. Perform DTC Confirmation Procedure.
 - See EC-958, "DTC Logic".
- 4. Check DTC.

Is the DTC P0607 displayed again?

YES >> GO TO 2.

NO >> INSPECTION END

2.REPLACE ECM

- 1. Replace ECM.
- 2. Go to EC-580, "ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT (ECM): Special Repair Requirement".

>> INSPECTION END

P0643 SENSOR POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

P0643 SENSOR POWER SUPPLY

DTC Logic INFOID:0000000003958880

DTC DETECTION LOGIC

EC

Α

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	
P0643	Sensor power supply circuit short	ECM detects that the voltage of power source for sensor is excessively low or high.	 Harness or connectors (Accelerator pedal position sensor 1 circuit is shorted.) [Camshaft position sensor (bank 2) circuit is shorted.] [Exhaust valve timing control position sensor (bank 2) circuit is shorted.] (Power steering pressure sensor circuit is shorted.) (Refrigerant pressure sensor circuit is shorted.) (Throttle position sensor circuit is shorted.) Accelerator pedal position sensor Camshaft position sensor (bank 2) Exhaust valve timing control position sensor (bank 2) Power steering pressure sensor Refrigerant pressure sensor Throttle position sensor]

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 8 V at idle.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- Start engine and let it idle for 1 second.
- Check DTC.

Is DTC detected?

YES >> Go to EC-959, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000000395888:

1. CHECK GROUND CONNECTION

- Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK ACCELERATOR PEDAL POSITION SENSOR 1 POWER SUPPLY CIRCUIT

- Disconnect accelerator pedal position (APP) sensor harness connector.
- Turn ignition switch ON.
- Check the voltage between APP sensor harness connector and ground.

EC-959 Revision: 2009 March 2009 FX35/FX50

Е

K

M

N

< DTC/CIRCUIT DIAGNOSIS >

APP sens	Ground	Voltage (V)	
Connector	Terminal	Ground	voitage (v)
E112 (Without ICC)	5	Ground	Approx. 5
E116 (With ICC)	5	Giodila	Αρρίολ. 3

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 3.

${f 3.}$ CHECK SENSOR POWER SUPPLY CIRCUIT

Check harness for short to power and short to ground, between the following terminals.

EC	CM	Sensor			
Connector	Terminal	Name Connector Terr			
	84	Electric throttle control actuator (bank 1)	F66	2	
	88	Camshaft position sensor (bank 2)	F83	1	
F111	88	EVT control position sensor (bank 2)	F63	1	
	92	Power steering pressure sensor	F35	3	
	92	Refrigerant pressure sensor	E77	3	
	96	Electric throttle control actuator (bank 2)	F64	2	
M160	99	APP sensor (Without ICC)	E112	5	
	99	APP sensor (With ICC)	E116	5	

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair short to ground or short to power in harness or connectors.

4. CHECK COMPONENTS

Check the following.

- Camshaft position sensor (bank 2) (Refer to <u>EC-875, "Component Inspection"</u>.)
- Exhaust valve timing control position sensor (bank 2) (Refer to <u>EC-972, "Component Inspection"</u>.)
- Power steering pressure sensor (Refer to EC-952, "Component Inspection".)
- Refrigerant pressure sensor (Refer to EC-1122, "Diagnosis Procedure".)

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace malfunctioning component.

5.check throttle position sensor

Refer to EC-1011, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 9.

NO >> GO TO 6.

6.replace electric throttle control actuator

- 1. Replace electric throttle control actuator.
- 2. Go to EC-1011, "Special Repair Requirement".

>> INSPECTION END

7. CHECK ACCELERATOR PEDAL POSITION SENSOR

Refer to EC-1069, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 9. NO >> GO TO 8.

Revision: 2009 March **EC-960** 2009 FX35/FX50

P0643 SENSOR POWER SUPPLY

[VK50VE] < DTC/CIRCUIT DIAGNOSIS > 8.REPLACE ACCELERATOR PEDAL ASSEMBLY Replace accelerator pedal assembly. 2. Go to EC-1070, "Special Repair Requirement". EC >> INSPECTION END 9. CHECK INTERMITTENT INCIDENT Refer to GI-35, "Intermittent Incident". >> INSPECTION END D Е F Н K M Ν 0 Р

EC-961 Revision: 2009 March 2009 FX35/FX50

P0850 PNP SWITCH

Description

When the selector lever position is P or N, park/neutral position (PNP) signal is sent to ECM from TCM.

DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0850	Park/neutral position switch	The signal of the park/neutral position (PNP) signal does not change during driving after the engine is started.	Harness or connectors [The park/neutral position (PNP) signal circuit is open or shorted.] TCM

DTC CONFIRMATION PROCEDURE

1. INSPECTION START

Will CONSULT-III be used?

Will CONSULT-III be used?

YES >> GO TO 2.

NO >> GO TO 5.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 3.

3. CHECK PNP SIGNAL

(II) With CONSULT-III

- 1. Turn ignition switch ON.
- 2. Select "P/N POSI SW" in "DATA MONITOR" mode with CONSULT-III. Then check the "P/N POSI SW" signal under the following conditions.

Position (Selector lever)	Known-good signal
N or P position	ON
Except above position	OFF

Is the inspection result normal?

YES >> GO TO 4.

NO >> Go to EC-963, "Diagnosis Procedure".

f 4 . PERFORM DTC CONFIRMATION PROCEDURE

- 1. Select "DATA MONITOR" mode with CONSULT-III.
- 2. Start engine and warm it up to normal operating temperature.
- Maintain the following conditions for at least 50 consecutive seconds.

 CAUTION:

Always drive vehicle at a safe speed.

ENG SPEED	1,300 - 6,375 rpm
COOLAN TEMP/S	More than 70°C (158°F)
B/FUEL SCHDL	2.0 - 31.8 msec

P0850 PNP SWITCH

< DTC/CIR	CUIT DIAG	NOSIS >	1 000	0 1 111 OW11 OI1		[VK50VE]	
VHCL SPEE	D SE	More th	nan 64 km/h (40 i	mph)	•		
Selector leve	r	Suitable	e position		=		Α
4. Check	1st trip DTC				-		
Is 1st trip D							EC
	Go to EC-9		osis Procedur	<u>e"</u> .			
_			ICTION CHE	CK			С
NOTE:	mponent Fu			C-963, "Component		k". sition (PNP) signal circuit.	D
During this of the inspector of the insp	check, a 1st ction result r INSPECTIO	trip DTC m normal? DN END	night not be co	onfirmed.		, , ,	Е
Compone		_		<u>c</u> .		INFOID:000000003958884	F
			ICTION CHE	CK			G
	nition switch		CM harness co	onnector terminals u	nder the followi	ng conditions.	Н
	ECM						
Connector	+ Terminal	- Terminal		Condition	Voltage (V)		I
M460	440	400	0-1	P or N position	Battery voltage		
M160	116	128	Selector lever	Except above position	Approx. 0		J
YES >>							
Diagnosis	s Procedu	ıre				INFOID:000000003958885	
1.CHECK	1.CHECK DTC WITH TCM						
Refer to TM			ription".				J. /J
Is the inspection result normal?							

YES >> GO TO 2.

NO >> Repair or replace malfunctioning part.

2. CHECK STARTING SYSTEM

Turn ignition switch OFF, then turn it to START.

Does starter motor operate?

YES >> GO TO 3.

NO >> Check DTC with BCM. Refer to STR-2, "Work Flow".

3.CHECK PNP SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect A/T assembly harness connector.
- 3. Disconnect ECM harness connector.
- 4. Check the continuity between A/T assembly harness connector and ECM harness connector.

Revision: 2009 March **EC-963** 2009 FX35/FX50

Ν

0

Р

A/T ass	embly	EC	CM	Continuity
Connector	Terminal	Connector	Connector Terminal	
F51	9	M160	116	Existed

5. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5. NO >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F10, E10
- Harness connectors E106, M6
- Harness for open or short between A/T assembly and ECM

>> Repair open circuit, short to ground or short to power in harness or connectors.

5.CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

P100A, P100B VVEL SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

P100A, P100B VVEL SYSTEM

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P100A or P100B is displayed with DTC P1090 or P1093, first perform the trouble diagnosis for DTC P1090 or P1093. Refer to <u>EC-983</u>, "<u>DTC Logic</u>".

D

Е

Α

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P100A	VVEL response malfunction (bank 1)		Harness or connectors (VVEL actuator motor circuit is open or shorted.)
P100B	VVEL response malfunction (bank 2)	Actual event response to target is poor.	VVEL actuator motor VVEL actuator sub assembly VVEL ladder assembly VVEL control module

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10 V at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- Start engine.
- 2. Depress the accelerator pedal rapidly half or more under no load conditions, and then release it.
- 3. Wait at idle for 5 seconds or more.
- 4. Repeat steps 2 to 3 for three times.
- 5. Check 1st trip DTC.

Is DTC detected?

YES >> Go to EC-965, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- 2. Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2. VVEL ACTUATOR MOTOR OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Disconnect VVEL control module harness connector.
- 2. Disconnect VVEL actuator motor harness connector.
- Check the continuity between VVEL control module harness connector and VVEL actuator motor harness connector.

EC

F

Н

K

- 1\

INFOID:0000000003959725

Ν

14

0

DTC No.	VVEL control module			VVEL actuator motor		Continuity	
DIC NO.	Bank	Connector	Terminal	Connector	Terminal	Continuity	
			12		1	Existed	
P100A	1		12	F73	2	Not existed	
PTOUA	'		25	F/3	1	Not existed	
		E15			2	Existed	
		- 215	LIS	2		1	Existed
P100B	2		2	F74	2	Not existed	
	2		15	F71	1	Not existed	
					2	Existed	

4. Also check harness for short to ground and power.

Is the inspection result normal?

YES >> GO TO 4. NO >> GO TO 3.

NO >> GO TO 3.

${f 3.}$ DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F10, E10
- Harness for open or short between VVEL actuator motor and VVEL control module

>> Repair open circuit, short to ground or short to power in harness or connectors.

4. CHECK VVEL ACTUATOR MOTOR

Refer to EC-967, "Component Inspection (VVEL ACTUATOR MOTOR)".

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 5.

${f 5.}$ REPLACE VVEL ACTUATOR SUB ASSEMBLY

- Replace VVEL actuator sub assembly.
- Perform <u>EC-968</u>, "Special Repair Requirement".

>> INSPECTION END

6. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace.

7. REPLACE VVEL CONTROL MODULE

- 1. Replace VVEL control module.
- 2. Go to EC-580, "ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT (VVEL CONTROL MOD-ULE): Special Repair Requirement".

>> GO TO 8.

8. PERFORM DTC CONFIRMATION PROCEDURE

- Turn ignition switch ON.
- Erase 1st trip DTC.
- 3. Perform DTC Confirmation Procedure. See <u>EC-965</u>, "<u>DTC Logic"</u>.

Is the DTC P100A or P100B displayed again?

P100A, P100B VVEL SYSTEM

< DTC/CIRCUIT DIAGNO		
	OSIS >	[VK50VE]
YES >> GO TO 9. NO >> INSPECTION	END	
9. CHECK VVEL ACTUAT		
	nent Inspection (VVEL ACTUATOR SUB ASSEMBLY)".	
s the inspection result nor		
YES >> GO TO 11.		
NO >> GO TO 10.		
10.REPLACE VVEL ACT	TUATOR SUB ASSEMBLY	
1. Replace VVEL actuato	or sub assembly.	
2. Perform <u>EC-968, "Spe</u>	ecial Repair Requirement".	
>> INSPECTION	END	
11.CHECK VVEL LADDE		
Refer to EM-236, "Inspection	ion".	_
s the inspection result nor		
YES >> GO TO 13. NO >> GO TO 12.		
	D HEAD WELL ADDED ASSEMBLY AND WELL ACTUATOR	CLID ACCEMBLY
	R HEAD, VVEL LADDER ASSEMBLY AND VVEL ACTUATOR	SOR ASSEMBLY
 Replace cylinder head Perform EC-968, "Spe 	d, VVEL ladder assembly and VVEL actuator sub assembly. <u>ecial Repair Requirement"</u> .	
	· · · · · · · · · · · · · · · · · · ·	
>> INSPECTION		
13.CHECK INTERMITTE	ENT INCIDENT	
Refer to GI-35, "Intermitter	nt Incident"	
	The mondone	
>> INSPECTION	END	
>> INSPECTION		INFOID:000000003959726
>> INSPECTION Component Inspection	END on (VVEL ACTUATOR MOTOR)	INFOID:000000003959726
>> INSPECTION Component Inspection CHECK VVEL ACTUAT Turn ignition switch OF	END on (VVEL ACTUATOR MOTOR) FOR MOTOR FF.	INFOID:000000003959726
>> INSPECTION Component Inspection CHECK VVEL ACTUAT Turn ignition switch OF Disconnect VVEL actu	END on (VVEL ACTUATOR MOTOR) FOR MOTOR FF. uator motor harness connector.	INFOID:0000000003959726
>> INSPECTION Component Inspection CHECK VVEL ACTUAT Turn ignition switch OF Disconnect VVEL actu	END on (VVEL ACTUATOR MOTOR) FOR MOTOR FF.	INFOID:000000003959726
>> INSPECTION Component Inspection CHECK VVEL ACTUAT Turn ignition switch OF Disconnect VVEL actu	END On (VVEL ACTUATOR MOTOR) FOR MOTOR FF. Use to motor harness connector. Ween VVEL actuator motor terminals as per the following.	INFOID:000000003959726
>> INSPECTION Component Inspection CHECK VVEL ACTUAT Turn ignition switch OF Disconnect VVEL actuat Check resistance between	END on (VVEL ACTUATOR MOTOR) FOR MOTOR FF. uator motor harness connector.	INFOID:000000003959726
>> INSPECTION Component Inspection CHECK VVEL ACTUAT Turn ignition switch OF Disconnect VVEL actuate Check resistance between	END On (VVEL ACTUATOR MOTOR) FOR MOTOR FF. Use to motor harness connector. Ween VVEL actuator motor terminals as per the following.	INFOID:000000003959726
>> INSPECTION Component Inspection 1. CHECK VVEL ACTUAT 1. Turn ignition switch OF 2. Disconnect VVEL actuat 3. Check resistance betwo VVEL actuator motor Terminal 1 and 2 s the inspection result nor	END On (VVEL ACTUATOR MOTOR) FOR MOTOR FF. Lator motor harness connector. Lator ween VVEL actuator motor terminals as per the following. Resistance 16 Ω or less Tmal?	INFOID:000000003959726
>> INSPECTION Component Inspection 1. CHECK VVEL ACTUAT 1. Turn ignition switch OF 2. Disconnect VVEL actuat 3. Check resistance betwo VVEL actuator motor Terminal 1 and 2 s the inspection result nor YES >> INSPECTION	END On (VVEL ACTUATOR MOTOR) FOR MOTOR FF. Lator motor harness connector. Lator ween VVEL actuator motor terminals as per the following. Resistance 16 Ω or less Tmal?	INFOID:000000003959726
>> INSPECTION Component Inspection 1. CHECK VVEL ACTUAT 1. Turn ignition switch OF 2. Disconnect VVEL actuator 3. Check resistance betwo VVEL actuator motor Terminal 1 and 2 s the inspection result nor YES >> INSPECTION NO >> GO TO 2.	END On (VVEL ACTUATOR MOTOR) FOR MOTOR FF. Uator motor harness connector. Ween VVEL actuator motor terminals as per the following. Resistance 16 Ω or less TMal? END	INFOID:000000003959726
>> INSPECTION Component Inspection 1. CHECK VVEL ACTUAT 1. Turn ignition switch OF 2. Disconnect VVEL actuator 3. Check resistance betwo VVEL actuator motor Terminal 1 and 2 s the inspection result nor YES >> INSPECTION NO >> GO TO 2. 2. REPLACE VVEL ACTU	END On (VVEL ACTUATOR MOTOR) FOR MOTOR FF. Uator motor harness connector. Ween VVEL actuator motor terminals as per the following. Resistance 16 Ω or less TMal? END JATOR SUB ASSEMBLY	INFOID:000000003959726
>> INSPECTION Component Inspection 1. CHECK VVEL ACTUAT 1. Turn ignition switch OF 2. Disconnect VVEL actuat 3. Check resistance betwo VVEL actuator motor Terminal 1 and 2 s the inspection result nor YES >> INSPECTION NO >> GO TO 2. 2. REPLACE VVEL ACTU 1. Replace VVEL actuator	END On (VVEL ACTUATOR MOTOR) FOR MOTOR FF. Uator motor harness connector. Ween VVEL actuator motor terminals as per the following. Resistance 16 Ω or less TMal? END JATOR SUB ASSEMBLY	INFOID:000000003959726
>> INSPECTION Component Inspection 1. CHECK VVEL ACTUAT 1. Turn ignition switch OF 2. Disconnect VVEL actuat 3. Check resistance betwo VVEL actuator motor Terminal 1 and 2 Is the inspection result nor YES >> INSPECTION NO >> GO TO 2. 2. REPLACE VVEL ACTU 1. Replace VVEL actuator	END On (VVEL ACTUATOR MOTOR) FOR MOTOR FF. Uator motor harness connector. Ween VVEL actuator motor terminals as per the following. Resistance 16 \Omega or less Tmal? END JATOR SUB ASSEMBLY or sub assembly.	INFOID:000000003959726
>> INSPECTION Component Inspection 1. CHECK VVEL ACTUAT 1. Turn ignition switch OF 2. Disconnect VVEL actuate 3. Check resistance betwo VVEL actuator motor Terminal 1 and 2 s the inspection result nor YES >> INSPECTION NO >> GO TO 2. 2. REPLACE VVEL ACTU 1. Replace VVEL actuator	END On (VVEL ACTUATOR MOTOR) FOR MOTOR FF. Dator motor harness connector. EVEL actuator motor terminals as per the following. Resistance 16 Ω or less Timal? END DATOR SUB ASSEMBLY OF sub assembly. Pecial Repair Requirement".	INFOID:000000003959726
>> INSPECTION Component Inspection 1. CHECK VVEL ACTUAT 1. Turn ignition switch OF 2. Disconnect VVEL actuat 3. Check resistance betwo VVEL actuator motor Terminal 1 and 2 s the inspection result norm YES >> INSPECTION NO >> GO TO 2. 2. REPLACE VVEL ACTU 1. Replace VVEL actuator 2. Perform EC-968, "Special Special S	END On (VVEL ACTUATOR MOTOR) FOR MOTOR FF. Dator motor harness connector. EVEL actuator motor terminals as per the following. Resistance 16 Ω or less Timal? END DATOR SUB ASSEMBLY OF sub assembly. Pecial Repair Requirement".	INFOID:000000003959726
>> INSPECTION Component Inspection 1. CHECK VVEL ACTUAT 1. Turn ignition switch OF 2. Disconnect VVEL actuat 3. Check resistance betwo VVEL actuator motor Terminal 1 and 2 s the inspection result norm YES >> INSPECTION NO >> GO TO 2. 2. REPLACE VVEL ACTU 1. Replace VVEL actuator 2. Perform EC-968, "Special of the component of the comp	END On (VVEL ACTUATOR MOTOR) FOR MOTOR FF. Dator motor harness connector. Ween VVEL actuator motor terminals as per the following. Resistance 16 Ω or less Timal? END JATOR SUB ASSEMBLY or sub assembly. Point sub assembly. Point sub assembly. Point Sub ASSEMBLY On (VVEL ACTUATOR SUB ASSEMBLY)	

Revision: 2009 March **EC-967** 2009 FX35/FX50

P100A, P100B VVEL SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

- 2. Remove VVEL actuator sub assembly. Refer to EM-228, "Disassembly and Assembly".
- Turn the ball screw shaft to check that it works smoothly.

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.REPLACE VVEL ACTUATOR SUB ASSEMBLY

- Replace VVEL actuator sub assembly.
- 2. Perform EC-968, "Special Repair Requirement".

>> INSPECTION END

Special Repair Requirement

INFOID:0000000003959728

1. PERFORM VVEL CONTROL SHAFT POSITION SENSOR ADJUSTMENT

Refer to EC-584, "VVEL CONTROL SHAFT POSITION SENSOR ADJUSTMENT: Special Repair Requirement".

>> GO TO 2.

2.PERFORM IDLE AIR VOLUME LEARNING

Refer to EC-583, "IDLE AIR VOLUME LEARNING: Special Repair Requirement".

>> END

P1078, P1084 EVT CONTROL POSITION SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Α

EC

D

Е

F

Н

Ν

P1078, P1084 EVT CONTROL POSITION SENSOR

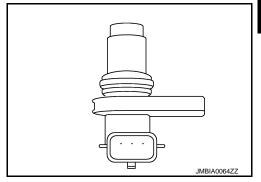
Description

Exhaust valve timing control position sensor detects the protrution of the signal plate installed to the exhaust camshaft front end.

This sensor signal is used for sensing a position of the exhaust camshaft.

This sensor uses a Hall IC.

Based on the position of the exhaust camshaft, ECM controls exhaust valve timing control solenoid valve to optimize the shut/open timing of exhaust valve for the driving condition.



DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P1078 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. Refer to EC-959, "DTC Logic".

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1078	Exhaust valve timing control position sensor (bank 1) circuit	An excessively high or low voltage from the sensor is sent to ECM.	Harness or connectors [Exhaust valve timing control position sensor (bank 1) circuit is open or shorted) (Accelerator pedal position sensor 2 circuit is shorted.) (Battery current sensor circuit is shorted.) [Camshaft position sensor (bank 1) circuit is shorted.] (Crankshaft position sensor circuit is shorted.) (EVAP control system pressure sensor circuit is shorted.) (Manifold pressure sensor circuit is shorted.) Exhaust valve timing control position sensor Accelerator pedal position sensor Battery current sensor Camshaft position sensor (bank 1) Crankshaft position sensor EVAP control system pressure sensor Manifold pressure sensor Accumulation of debris to the signal pick-up portion of the camshaft
P1084	Exhaust valve timing control position sensor (bank 2) circuit		 Harness or connectors [Exhaust valve timing control position sensor (bank 2) circuit is open or shorted) Exhaust valve timing control position sensor (bank 2) Crankshaft position sensor Camshaft position sensor (bank 2) Accumulation of debris to the signal pick-up portion of the camshaft

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

P1078, P1084 EVT CONTROL POSITION SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

2.perform dtc confirmation procedure

- 1. Start engine and let it idle for 10 seconds.
- 2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-970, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003958888

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- 2. Check ground connection M95, F33, F34. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK EXHAUST VALVE TIMING CONTROL POSITION SENSOR POWER SUPPLY CIRCUIT-I

- Disconnect exhaust valve timing (EVT) control position sensor harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between exhaust valve timing control position sensor harness connector and ground.

DTC	EVT	control positi	Ground	Voltage (V)	
DIC	Bank Coni		Terminal		
P1078	1	F59	1	Ground	Approx. 5
P1084	2	F63	1	Ground	Αμριύχ. 3

Is the inspection result normal?

YES >> GO TO 8.

NO-1 >> P1078: GO TO 3.

NO-2 >> P1084: Repair open circuit, short to ground or short to power in harness or connectors.

3. CHECK EVT CONTROL POSITION SENSOR POWER SUPPLY CIRCUIT-II

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check the continuity between EVT control position sensor harness connector and ECM harness connector.

EVT	EVT control position sensor			ECM		
Bank	Connector	Terminal	Connector	Connector Terminal		
1	F59	1	F111	91	Existed	

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit.

4.CHECK SENSOR POWER SUPPLY CIRCUIT

Check harness for short to power and short to ground, between the following terminals.

P1078, P1084 EVT CONTROL POSITION SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

EC	M	Sensor				Α
Connector	Terminal	Name	Connector	Terminal		
	87	Crankshaft position sensor	F2	1		EC
	91	Camshaft position sensor (bank 1)	F84	1		
F111	91	EVT control position sensor (bank 1)	F59	1		
FIII		Battery current sensor	E21	1		С
	95	EVAP control system pressure sensor	B252	3		
		Manifold pressure sensor	F65	1		D
M160	99	APP sensor (Wthout ICC)	E112	6		D
IVI 16U	99	APP sensor (with ICC)	E116	3		
Is the inspe	ection resu	ult normal?				Е
Check the Cranksha Camshaf Battery c	Check the following. Crankshaft position sensor (Refer to <u>EC-870, "Component Inspection"</u> .) Camshaft position sensor (bank 1) (Refer to <u>EC-875, "Component Inspection"</u> .) Battery current sensor (Refer to <u>EC-1019, "Component Inspection"</u> .)					F G
 Manifold Is the inspendent 	 EVAP control system pressure sensor (Refer to <u>EC-911, "Component Inspection"</u>.) Manifold pressure sensor (Refer to <u>EC-1115, "Component Inspection"</u>.) Is the inspection result normal? 					
_	> GO TO (> Replace	malfunctioning component.				1
6.CHECK	•					,
Refer to E	Refer to EC-1069, "Component Inspection".					
Is the inspe	ection resu	ult normal?				J
YES >:	> GO TO	14.				

NO >> GO TO 7.

7.replace accelerator pedal assembly

- Replace accelerator pedal assembly.
- 2. Go to EC-1070, "Special Repair Requirement".

>> INSPECTION END

$8. \mathsf{CHECK}\ \mathsf{EVT}\ \mathsf{CONTROL}\ \mathsf{POSITION}\ \mathsf{SENSOR}\ \mathsf{GROUND}\ \mathsf{CIRCUIT}\ \mathsf{FOR}\ \mathsf{OPEN}\ \mathsf{AND}\ \mathsf{SHORT}$

- Turn ignition switch OFF.
- Disconnect ECM harness connector.
- Check the continuity between EVT control position sensor harness connector and ECM harness connector.

DTC	EVT control position sensor EC			EVT control position sensor ECM		Continuity		
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity		
P1078	1	F59	2	F111	58	Existed		
P1084	2	F63	2	FIII	ГШ	FIII	30	LAISIEU

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

EC-971 Revision: 2009 March 2009 FX35/FX50

Ν

M

K

Р

9. CHECK EVT CONTROL POSITION SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

Check the continuity between EVT control position sensor harness connector and ECM harness connector

DTC	EVT control position sensor			EC	Continuity	
ыс	Bank	Connector	Terminal	Connector	Terminal	Continuity
P1078	1	F59	3	E111	60	Existed
P1084	2	F63	3	F111	64	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

10.CHECK EXHAUST VALVE TIMING CONTROL POSITION SENSOR

Refer to EC-972, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 11.

NO >> Replace malfunctioning exhaust valve timing control position sensor.

11. CHECK CRANKSHAFT POSITION SENSOR

Refer to EC-870, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 12.

NO >> Replace crankshaft position sensor.

12. CHECK CAMSHAFT POSITION SENSOR

Refer to EC-875, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 13.

NO >> Replace malfunctioning camshaft position sensor.

13. CHECK CAMSHAFT (EXH)

Check the following.

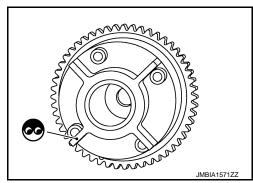
- · Accumulation of debris to the signal plate of camshaft front end
- · Chipping signal plate of camshaft front end

Is the inspection result normal?

YES >> GO TO 14.

NO >> Remove de

>> Remove debris and clean the signal plate of camshaft front end or replace camshaft.



14. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000003958889

1. EXHAUST VALVE TIMING CONTROL POSITION SENSOR-I

- 1. Turn ignition switch OFF.
- 2. Disconnect exhaust valve timing control position sensor harness connector.

Revision: 2009 March **EC-972** 2009 FX35/FX50

P1078, P1084 EVT CONTROL POSITION SENSOR

< DTC/CIRCUIT DIAGNOSIS >

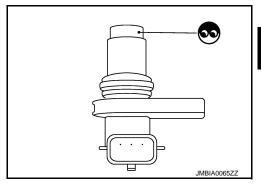
[VK50VE]

- 3. Loosen the fixing bolt of the sensor.
- 4. Remove the sensor.
- 5. Visually check the sensor for chipping.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace malfunctioning exhaust valve timing control position sensor.



2.EXHAUST VALVE TIMING CONTROL POSITION SENSOR-II

Check resistance exhaust valve timing control position sensor terminals as shown below.

Terminals	Resistance
1 (+) - 2 (-)	
1 (+) - 3 (-)	Except 0 or ∞ Ω [at 25°C (77°F)]
2 (+) - 3 (-)	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace malfunctioning exhaust valve timing control position sensor.

EC

Α

D

F

Е

G

Н

-

K

L

 \mathbb{N}

Ν

0

Р

P1087, P1088 VVEL SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

P1087, P1088 VVEL SYSTEM

DTC Logic INFOID:0000000003959730

DTC DETECTION LOGIC

If DTC P1087 or P1088 is displayed with DTC P1090 or P1093. Perform the trouble diagnosis for DTC P1090 or P1093. Refer to EC-979, "DTC Logic".

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1087	VVEL small event angle malfunction (bank 1)		Harness or connectors (VVEL actuator motor circuit is
P1088	VVEL small event angle malfunction (bank 2)	The event angle of VVEL control shaft is always small.	open or shorted.) VVEL actuator motor VVEL actuator sub assembly VVEL ladder assembly VVEL control module

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Α

EC

D

Е

P1089, P1092 VVEL CONTROL SHAFT POSITION SENSOR

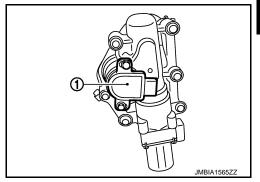
Description INFOID:0000000004055129

VVEL control shaft position sensor (1) is placed on VVEL actuator sub assembly and detects the control shaft position angle.

A magnet is pressed into the arm on the edge of control shaft.

The magnetic field changes as the magnet rotates together with the arm resulting in the output voltage change of the sensor.

VVEL control module detects the actual position angle through the voltage change and sends the signal to ECM.



DTC Logic INFOID:0000000003959732

DTC DETECTION LOGIC

NOTE:

If DTC P1089 or P1092 is displayed with DTC P1608, first perform the trouble diagnosis for DTC P1608. Refer to EC-1060, "DTC Logic".

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1089	VVEL control shaft position sensor (bank 1) circuit	An excessively low voltage from the sensor is sent to VVEL control module.	Harness or connectors
P1092	VVEL control shaft position sensor (bank 2) circuit	 An excessively high voltage from the sensor is sent to VVEL control module. Rationally incorrect voltage is sent to VVEL control module compared with the signals from VVEL control shaft position sensor 1 and VVEL control shaft position sensor 2. 	 (VVEL control shaft position sensor circuit is open or shorted.) VVEL control shaft position sensor VVEL control module

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10 V at idle.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- Start engine and let it idle for 1 second.
- Check DTC.

Is DTC detected?

YES >> Go to EC-975, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1. CHECK GROUND CONNECTION

- Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

L

Ν

INFOID:0000000003959733

[VK50VE]

< DTC/CIRCUIT DIAGNOSIS >

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.vvel control shaft position sensor power supply circuit

- 1. Disconnect VVEL control shaft position sensor harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between VVEL control shaft position sensor harness connector and ground.

DTC No.	VVEL co	ontrol shaft position	osition sensor Ground Vol			
DIC No.	Bank	Connector	Terminal	Ground	Voltage	
P1089	1	F72	3			
F 1009	'	6		Ground	Approx. 5V	
P1092	2	F70	3	Ground	Αρρίολ. 3ν	
F 1092	2	170	6			

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F10, E10
- Harness for open or short between VVEL control shaft position sensor and VVEL control module

>> Repair open circuit, short to ground or short to power in harness or connectors.

4. CHECK VVEL CONTROL SHAFT POSITION SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect VVEL control module harness connector.
- Check the continuity between VVEL control shaft position sensor harness connector and VVEL control module harness connector.

DTC No.	VVEL control shaft position sensor			VVEL control module		Continuity		
DIC No.	Bank	Connector	Terminal	Connector	Terminal	Continuity		
P1089	1	F72	2		9			
F 1009	'	F72	172	172	1 172	5 E16	17	Existed
P1092	0	F70	2	LIO	4	LXISIEU		
F 1092	2	F70	5		17			

4. Also check harness for short to ground and power.

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 5.

DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F10, E10
- Harness for open or short between VVEL control shaft position sensor and VVEL control module

>> Repair open circuit, short to ground or short to power in harness or connectors.

6.vvel control shaft position sensor input signal circuit for open and short

Check the continuity between VVEL control shaft position sensor harness connector and VVEL control
module harness connector.

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

DTC No.	VVEL co	ontrol shaft positio	n sensor	VVEL con	trol module	Continuity	
DIC NO.	Bank	Connector	Terminal	Connector	Terminal	- Continuity	
P1089	1	F72	1		3		
P1009	1	F/2	4	E16	16	Eviated	
D4000	0	F70	1	_ E10	5	Existed	
P1092	2	F70	4		18		
Also chec	k harness for	short to groun	d and power.				
the inspection	on result norr	nal?					
	O TO 8. O TO 7.						
.DETECT M	IALFUNCTIO	NING PART					
heck the follo							
Harness con	nectors F10,						
Harness for	open or short	between VVE	L control sha	ft position sen	sor and VVEL	. control modul	е
_							
	-	_	round or sho	rt to power in h	narness or cor	nnectors.	
.CHECK IN	TERMITTEN ⁻	T INCIDENT					
efer to GI-35	, "Intermitten	t Incident".					
the inspection	on result norn	nal?					
	O TO 9.						
	epair or repla						
.REPLACE	VVEL CONT	ROL MODULE					
. Replace V	/VEL control	module.					
. Perform E	EC-580, "AD	DITIONAL SE		N REPLACIN	G CONTROL	<u>UNIT (VVEL</u>	CONTROL
MODULE)) : Special Re	pair Requirem	<u>ent"</u> .				
0	O TO 40						
_	O TO 10.						
U. PERFOR	RM DTC CON	FIRMATION F	ROCEDURE				
	on switch ON	l.					
. Erase DT0 . Perform D		tion Procedure	2				
	75, "DTC Loc						
•		2 displayed aga	ain?				
	O TO 11.						
	ISPECTION I	END					
1.REPLACI	E VVEL ACT	UATOR SUB A	ASSEMBLY				
		r sub assembly					
		cial Repair Rec					
>> IN	ISPECTION I	END					
pecial Rer	pair Requi	rement				IN	IFOID:0000000003959734
	•		ם ואטודוטטו פי	ENSOR ADJU	STMENIT		
efer to EC-5	<u>84, "VVEL C</u>	<u>ONTROL SHA</u>	AFT POSITIO	<u>N SENSOR A</u>	<u> DJUSTMEN</u> 1	: Special Rep	<u>pair Require-</u>

>> GO TO 2.

ment".

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

 $2.\mathsf{PERFORM}$ IDLE AIR VOLUME LEARNING

Refer to EC-583, "IDLE AIR VOLUME LEARNING: Special Repair Requirement".

>> END

P1090, P1093 VVEL ACTUATOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

P1090, P1093 VVEL ACTUATOR MOTOR

Description INFOID:0000000003959735

The VVEL actuator motor rotates the control shaft according to the control signal from the VVEL control module. The VVEL control module judges whether the VVEL actuator motor controls the angle properly by the VVEL control shaft position sensor signal.

EC

Α

DTC Logic

INFOID:0000000003959736

DTC DETECTION LOGIC

If DTC P1090 or P1093 is displayed with DTC P1091, first perform the trouble diagnosis for DTC P1091. Refer to EC-983, "DTC Logic".

Danaikla assusa

DIC No.	i rouble diagnosis name	DTC detecting condition	Possible cause
P1090	VVEL system performance (bank 1)	Event angle difference between the	Harness or connectors (VVEL actuator motor circuit is open or shorted.)
P1093	VVEL system performance (bank 2)	 actual and the target is detected. Abnormal current is sent to VVEL actuator motor. 	VVEL actuator motorVVEL actuator sub assemblyVVEL ladder assemblyVVEL control module

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10 V at idle.

>> GO TO 2.

2 .PERFORM DTC CONFIRMATION PROCEDURE

- Start engine and let it idle for 10 second.
- Keep the engine speed at approximately 3,500 rpm for at least 10 seconds under no load.
- Check DTC.

Is DTC detected?

YES >> Go to EC-979, "Diagnosis Procedure".

NO >> INSPECTION END

INFOID:0000000003959737

Diagnosis Procedure

1. CHECK GROUND CONNECTION

- Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.VVEL ACTUATOR MOTOR OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Disconnect VVEL control module harness connector.
- Disconnect VVEL actuator motor harness connector.
- Check the continuity between VVEL control module harness connector and VVEL actuator motor harness connector.

K

Ν

Р

DTC No.	V	VVEL control module VVEL actuator motor		ator motor	- Continuity		
DIC No.	Bank	Connector	Terminal	Connector	Terminal	Continuity	
			12		1	Existed	
P1090	1		12 F7	E72	2	Not existed	
F 1090	•			25		1	Not existed
		E16			2	Existed	
	P1093 2		2		1	Existed	
P1093				2	F71	2	Not existed
P 1093	2			Г/Т	1	Not existed	
			15		2	Existed	

4. Also check harness for short to ground and power.

Is the inspection result normal?

YES >> GO TO 4. NO >> GO TO 3.

${f 3.}$ DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F10, E10
- Harness for open or short between VVEL actuator motor and VVEL control module

>> Repair open circuit, short to ground or short to power in harness or connectors.

4. CHECK VVEL ACTUATOR MOTOR

Refer to EC-981, "Component Inspection (VVEL ACTUATOR MOTOR)".

Is the inspection result normal?

YES >> GO TO 6. NO >> GO TO 5.

REPLACE VVEL ACTUATOR SUB ASSEMBLY

- Replace VVEL actuator sub assembly.
- Perform <u>EC-982</u>, "Special Repair Requirement".

>> INSPECTION END

6. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace.

7. REPLACE VVEL CONTROL MODULE

- 1. Replace VVEL control module.
- Perform <u>EC-580</u>, "ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT (VVEL CONTROL MODULE): Special Repair Requirement".

>> GO TO 8.

8. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Turn ignition switch ON.
- Erase DTC.
- Perform DTC Confirmation Procedure. See <u>EC-979</u>, "<u>DTC Logic</u>".

Is the DTC P1090 or P1093 displayed again?

P1090, P1093 VVEL ACTUATOR MOTOR

	P1090, P1093 VVEL ACTUATOR MO	[VK50VE]
< DTC/CIRCUIT DIAGNO YES >> GO TO 9.	518 >	[VK30VL]
NO >> INSPECTION I	END	
9.check vvel actuate	OR SUB ASSEMBLY	
Refer to EC-981, "Compone	ent Inspection (VVEL ACTUATOR SUB ASSEMB	<u>SLY)"</u> .
s the inspection result norr	<u>าล!?</u>	
YES >> GO TO 11. NO >> GO TO 10.		
10.replace vvel act	LIATOR SUR ASSEMBLY	
. Replace VVEL actuato		
	ial Repair Requirement".	
INCDECTION I	-NID	
>> INSPECTION F 11.CHECK VVEL LADDE		
Refer to EM-236, "Inspection		
s the inspection result norr		
YES >> GO TO 13.		
NO >> GO TO 12.		
	HEAD, VVEL LADDER ASSEMBLY AND VVEL	_
	VVEL ladder assembly and VVEL actuator sub a cial Repair Requirement".	assembly.
. 1 enoini <u>Lo-302, opec</u>	iai Kepaii Kequirement .	
>> INSPECTION I	END	
3.CHECK INTERMITTE	NT INCIDENT	
Refer to GI-35, "Intermitten	Incident".	
>> INSPECTION I		
Component Inspectio	n (VVEL ACTUATOR MOTOR)	INFOID:0000000003959738
.CHECK VVEL ACTUATO	OR MOTOR	
. Turn ignition switch OF		
 Disconnect VVEL actual 	ator motor harness connector.	
. Check resistance between	een VVEL actuator motor terminals as per the foll	lowing.
VVEL actuator motor		
Terminal	Resistance	
1 and 2	16Ω or less	
s the inspection result norn	nal?	
YES >> INSPECTION I	END	
NO >> GO TO 2.	ATOR OUR AGOSTABLY	
REPLACE VVEL ACTU		
Replace VVEL actuatoPerform EC-982, "Spec	r sub assembly. <u>sial Repair Requirement"</u> .	
>> INSPECTION I	END	
Component Inspectio	n (VVEL ACTUATOR SUB ASSEMBL)	Y)
LCHECK VVEL ACTUATO	•	
. Turn ignition switch OF	r.	

Revision: 2009 March **EC-981** 2009 FX35/FX50

P1090, P1093 VVEL ACTUATOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

- 2. Remove VVEL actuator sub assembly. Refer to EM-228, "Disassembly and Assembly".
- Turn the ball screw shaft to check that it works smoothly.

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.REPLACE VVEL ACTUATOR SUB ASSEMBLY

- Replace VVEL actuator sub assembly.
- 2. Perform EC-982, "Special Repair Requirement".

>> INSPECTION END

Special Repair Requirement

INFOID:0000000003959740

1. PERFORM VVEL CONTROL SHAFT POSITION SENSOR ADJUSTMENT

Refer to EC-584, "VVEL CONTROL SHAFT POSITION SENSOR ADJUSTMENT: Special Repair Requirement".

>> GO TO 2.

2.PERFORM IDLE AIR VOLUME LEARNING

Refer to EC-583, "IDLE AIR VOLUME LEARNING: Special Repair Requirement".

>> END

P1091 VVEL ACTUATOR MOTOR RELAY

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

P1091 VVEL ACTUATOR MOTOR RELAY

Description INFOID:0000000003959741

Power supply for the VVEL actuator motor is provided to the VVEL control module via VVEL actuator motor relay. VVEL actuator motor relay is ON/OFF controlled by the VVEL control module. In addition, when the VVEL actuator motor relay cannot be controlled by the VVEL control module for some reason, it ON/OFF controlled by ECM.

INFOID:0000000003959742

DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1091	VVEL actuator motor relay circuit	VVEL control module detects the VVEL actuator motor relay is stuck OFF. VVEL control module detects the VVEL actuator motor relay is stuck ON.	Harness or connectors (VVEL actuator motor relay circuit is open or shorted.) (Abort circuit is open or shorted.) VVEL actuator motor relay VVEL control module ECM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10 V at idle.

>> GO TO 2.

2.perform dtc confirmation procedure

- Turn ignition switch ON and wait at least 1 seconds.
- Turn ignition switch OFF and wait at least 10 seconds. 2.
- Turn ignition switch ON and wait at least 1 seconds.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-983, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1. VVEL ACTUATOR MOTOR RELAY POWER SUPPLY CIRCUIT-I

- Turn ignition switch OFF.
- 2. Disconnect VVEL actuator motor relav.
- Check the voltage between VVEL actuator motor relay harness connector and ground.

VVEL actuat	or motor relay	Ground	Voltage	
Connector Terminal		Glound	vollage	
E90	2	Ground	Battery voltage	
	5	Glound		

Is the inspection result normal?

YES >> GO TO 3. NO >> GO TO 2.

Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

M

Ν

Р

INFOID:0000000003959743

EC-983

[VK50VE]

2.DETECT MALFUNCTIONING PART

Check the following.

- 50A fusible link (letter G)
- Harness for open or short between VVEL actuator motor relay and battery
 - >> Repair open circuit, short to ground or short to power in harness or connectors.

3.vvel actuator motor relay power supply circuit-ii

- 1. Disconnect VVEL control module harness connector.
- 2. Check the continuity between VVEL actuator motor relay harness connector and VVEL control module harness connector.

VVEL con	trol module	VVEL actuator motor relay		Continuity	
Connector	Terminal	Connector Terminal		Continuity	
E15	23	E16	1	Existed	

3. Also check harness for short to ground and power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

4. VVEL ACTUATOR MOTOR RELAY INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

 Check the continuity between VVEL actuator motor relay harness connector and VVEL control module harness connector.

VVEL control module			VVEL actuator motor relay		Continuity
Bank	Connector	Terminal	Connector	Terminal	Continuity
1	E16	13	E90	2	Existed
2	LIO	1	L90	3	LAISIEU

2. Also check harness for short to ground and power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

${f 5.}$ CHECK VVEL ACTUATOR MOTOR RELAY

Refer to EC-985. "Component Inspection".

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace VVEL actuator motor relay.

6.CHECK ABORT CIRCUIT FOR OPEN AND SHORT

- 1. Disconnect ECM harness connector.
- 2. Check the continuity between VVEL control module harness connector and ECM harness connector.

VVEL control module		ECM		Continuity
Connector	Terminal	Connector Terminal		Continuity
E16	21	F111	65	Existed

3. Also check harness for short to ground and power.

Is the inspection result normal?

YES >> GO TO 8.

NO >> GO TO 7.

7. DETECT MALFUNCTIONING PART

Check the following.

Revision: 2009 March **EC-984** 2009 FX35/FX50

P1091 VVEL ACTUATOR MOTOR RELAY

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

- Harness connectors F10, E10
- Harness for open and short between ECM and VVEL control module

>> Repair open circuit, short to ground or short to power in harness or connectors.

8. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair or replace.

9. REPLACE VVEL CONTROL MODULE

- 1. Replace VVEL control module.
- Perform <u>EC-580</u>, "<u>ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT (VVEL CONTROL MODULE)</u>: Special Repair Requirement".

>> GO TO 10.

10. PERFORM DTC CONFIRMATION PROCEDURE

- Turn ignition switch ON.
- 2. Erase DTC.
- 3. Perform DTC Confirmation Procedure. See <u>EC-983</u>, "<u>DTC Logic"</u>.

Is the DTC P1091 displayed again?

YES >> GO TO 11.

NO >> INSPECTION END

11.REPLACE ECM

- 1. Replace ECM.
- Perform <u>EC-580</u>, "<u>ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT (ECM)</u>: <u>Special Repair Requirement</u>".

>> INSPECTION END

Component Inspection

1. CHECK VVEL ACTUATOR MOTOR RELAY

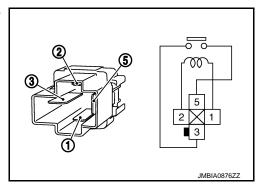
- Turn ignition switch OFF.
- Remove VVEL actuator motor relay.
- 3. Check the continuity between VVEL actuator motor relay terminals under the following conditions.

Terminal	Condition	Continuity
3 and 5	12V direct current supply between terminals 1 and 2	Existed
	No current supply	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace VVEL actuator motor relay.



EC

Α

D

Е

F

G

Н

_

INFOID:0000000003959744

M

N

0

P1148, P1168 CLOSED LOOP CONTROL

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

P1148, P1168 CLOSED LOOP CONTROL

DTC Logic

DTC DETECTION LOGIC

NOTE:

DTC P1148 or P1168 is displayed with another DTC for A/F sensor 1. Perform the trouble diagnosis for the corresponding DTC.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	
P1148	Closed loop control function (bank 1)	The closed loop control function for bank 1 does not operate even when vehicle is being driven in the specified condition.	(The A/F sensor 1 circuit is open or short	
P1168	Closed loop control function (bank 2)	The closed loop control function for bank 2 does not operate even when vehicle is being driven in the specified condition.	A/F sensor 1A/F sensor 1 heater	

P1211 TCS CONTROL UNIT [VK50VE] < DTC/CIRCUIT DIAGNOSIS > P1211 TCS CONTROL UNIT Α Description INFOID:0000000003958891 The malfunction information related to TCS is transferred through the CAN communication line from "ABS EC actuator and electric unit (control unit)" to ECM. Be sure to erase the malfunction information such as DTC not only for "ABS actuator and electric unit (control unit)" but also for ECM after TCS related repair. **DTC** Logic INFOID:0000000003958892 DTC DETECTION LOGIC D Freeze frame data is not stored in the ECM for this self-diagnosis. DTC No. DTC detecting condition Possible cause Е Trouble diagnosis name ECM receives malfunction information from · ABS actuator and electric unit (control unit) P1211 TCS control unit "ABS actuator and electric unit (control unit)". · TCS related parts DTC CONFIRMATION PROCEDURE 1.PRECONDITIONING **TESTING CONDITION:** Before performing the following procedure, confirm that battery voltage is more than 10.5 V at idle. Н >> GO TO 2. 2.PERFORM DTC CONFIRMATION PROCEDURE Start engine and let it idle for at least 60 seconds. Check 1st trip DTC. Is 1st trip DTC detected? YES >> EC-987, "Diagnosis Procedure" >> INSPECTION END NO Diagnosis Procedure INFOID:0000000003958893 Go to BRC-5, "Work Flow".

Revision: 2009 March EC-987 2009 FX35/FX50

Ν

Р

P1212 TCS COMMUNICATION LINE

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

INFOID:0000000003958896

P1212 TCS COMMUNICATION LINE

Description

This CAN communication line is used to control the smooth engine operation during the TCS operation. Pulse signals are exchanged between ECM and "ABS actuator and electric unit (control unit)".

Be sure to erase the malfunction information such as DTC not only for "ABS actuator and electric unit (control unit)" but also for ECM after TCS related repair.

DTC Logic

DTC DETECTION LOGIC

NOTE:

- If DTC P1212 is displayed with DTC UXXXX, first perform the trouble diagnosis for DTC UXXXX.
- If DTC P1212 is displayed with DTC P0607, first perform the trouble diagnosis for DTC P0607. Refer to <u>EC-958</u>, "<u>DTC Logic"</u>.

Freeze frame data is not stored in the ECM for this self-diagnosis.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1212	TCS communication line	ECM cannot receive the information from "ABS actuator and electric unit (control unit)" continuously.	Harness or connectors (The CAN communication line is open or shorted.) ABS actuator and electric unit (control unit) Dead (Weak) battery

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10.5 V at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine and let it idle for at least 10 seconds.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-988, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

Go to BRC-5, "Work Flow".

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

P1217 ENGINE OVER TEMPERATURE

DTC Logic

DTC DETECTION LOGIC

NOTE:

- If DTC P1217 is displayed with DTC UXXXX, first perform the trouble diagnosis for DTC UXXXX.
- If DTC P1217 is displayed with DTC P0607, first perform the trouble diagnosis for DTC P0607. Refer to <u>EC-958</u>, "DTC Logic".

If the cooling fan or another component in the cooling system malfunctions, engine coolant temperature will rise.

When the engine coolant temperature reaches an abnormally high temperature condition, a malfunction is indicated.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1217	Engine over temperature (Overheat)	 Cooling fan does not operate properly (Overheat). Cooling fan system does not operate properly (Overheat). Engine coolant was not added to the system using the proper filling method. Engine coolant is not within the specified range. 	Harness or connectors (The cooling fan circuit is open or shorted.) IPDM E/R Cooling fan control module Cooling fan motor Radiator hose Radiator Radiator cap Water pump Thermostat

CAUTION:

When a malfunction is indicated, always replace the coolant. Refer to CO-33, "Draining" and CO-34, "Refilling". Also, replace the engine oil. Refer to LU-26, "Draining" and LU-27, "Refilling".

- 1. Fill radiator with coolant up to specified level with a filling speed of 2 liters per minute. Always use coolant with the proper mixture ratio. Refer to MA-13, "Anti-Freeze Coolant Mixture Ratio".
- 2. After refilling coolant, run engine to ensure that no water-flow noise is emitted.

DTC CONFIRMATION PROCEDURE

1. PERFORM COMPONENT FUNCTION CHECK

Perform component function check. Refer to EC-989, "Component Function Check".

NOTE:

Use component function check to check the overall function of the cooling fan. During this check, a DTC might not be confirmed.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-990, "Diagnosis Procedure".

Component Function Check

1.PERFORM COMPONENT FUNCTION CHECK-I

WARNING:

Never remove the radiator cap when the engine is hot. Serious burns could be caused by high pressure fluid escaping from the radiator.

Wrap a thick cloth around cap. Carefully remove the cap by turning it a quarter turn to allow built-up pressure to escape. Then turn the cap all the way off.

EC

Α

Е

D

F

П

K

L

. . .

N

Р

INFOID:0000000003958898

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

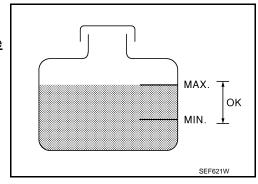
Check the coolant level in the reservoir tank and radiator.

Allow engine to cool before checking coolant level.

<u>Is the coolant level in the reservoir tank and/or radiator below the proper range?</u>

YES >> Go to EC-990, "Diagnosis Procedure".

NO >> GO TO 2.



2.PERFORM COMPONENT FUNCTION CHECK-II

Confirm whether customer filled the coolant or not.

Did customer fill the coolant?

YES >> Go to EC-990, "Diagnosis Procedure".

NO >> GO TO 3.

3.perform component function check-iii

- (II) With CONSULT-III
- 1. Turn ignition switch ON.
- 2. Perform "FAN DUTY CONTROL" in "ACTIVE TEST" mode with CONSULT-III.
- 3. Check that cooling fan speed varies according to the percentage.
- (R) Without CONSULT-III

Perform IPDM E/R auto active test and check cooling fan motors operation, refer to <u>PCS-11, "Diagnosis</u> Description".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-990, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003958899

1. CHECK COOLING FAN OPERATION

- (III) With CONSULT-III
- 1. Turn ignition switch ON.
- 2. Perform "FAN DUTY CONTROL" in "ACTIVE TEST" mode with CONSULT-III.
- 3. Check that cooling fan speed varies according to the percentage.
- Without CONSULT-III
- Perform IPDM E/R auto active test and check cooling fan motors operation, refer to <u>PCS-11, "Diagnosis Description"</u>.
- Check that cooling fan operates.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Go to EC-1089, "Diagnosis Procedure".

2. CHECK COOLING SYSTEM FOR LEAKAGE-I

Check cooling system for leakage. Refer to CO-33, "Inspection".

Is leakage detected?

YES >> GO TO 3.

NO >> GO TO 4.

3.CHECK COOLING SYSTEM FOR LEAKAGE-II

Check the following for leakage.

- Hose
- Radiator
- Water pump

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

>> Repair or replace malfunctioning part.

4. CHECK RADIATOR CAP

Check radiator cap. Refer to CO-37, "RADIATOR CAP: Inspection".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace radiator cap.

5. CHECK THERMOSTAT

Check thermostat. Refer to CO-47, "Inspection".

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace thermostat

6.CHECK ENGINE COOLANT TEMPERATURE SENSOR

Refer to EC-785, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace engine coolant temperature sensor.

7. CHECK MAIN 12 CAUSES

If the cause cannot be isolated, check the following.

Engine	Step	Inspection item	Equipment	Standard	Reference page
OFF	1	Blocked radiator Blocked condenser Blocked radiator grille Blocked bumper	Visual	No blocking	_
	2	Coolant mixture	Coolant tester	Refer to MA-13, "Anti-Free	ze Coolant Mixture Ratio".
	3	Coolant level	Visual	Coolant up to MAX level in reservoir tank and radiator filler neck	CO-33, "Inspection"
	4	Radiator cap	Pressure tester	Refer to CO-37, "RADIATO	OR CAP : Inspection".
ON* ²	5	Coolant leakage	Visual	No leakage	CO-33, "Inspection"
ON* ²	6	Thermostat	Touch the upper and lower radiator hoses	Both hoses should be hot	CO-47, "Inspection"
ON* ¹	7	Cooling fan	CONSULT-III	Operating	EC-989, "Component Function Check"
OFF	8	Combustion gas leak- age	Color checker chemical tester 4 Gas analyzer	Negative	_
ON* ³	9	Coolant temperature gauge	Visual	Gauge less than 3/4 when driving	_
		Coolant overflow to reservoir tank	Visual	No overflow during driving and idling	CO-33, "Inspection"
OFF* ⁴	10	Coolant return from reservoir tank to radiator	Visual	Should be initial level in reservoir tank	CO-33, "Inspection"
OFF	11	Cylinder head	Straight gauge feeler gauge	0.1 mm (0.004 in) Maximum distortion (warping)	EM-251, "Inspection"
	12	Cylinder block and pistons	Visual	No scuffing on cylinder walls or piston	EM-265, "Inspection"

^{*1:} Turn the ignition switch ON.

For more information, refer to CO-29, "Troubleshooting Chart".

EC-991 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

F

Н

Ν

^{*2:} Engine running at 3,000 rpm for 10 minutes.

^{*3:} Drive at 90 km/h (56 MPH) for 30 minutes and then let idle for 10 minutes.

^{*4:} After 60 minutes of cool down time.

[VK50VE]

>> INSPECTION END

P1220 FUEL PUMP CONTROL MODULE (FPCM)

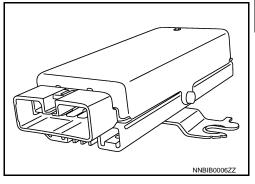
< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

P1220 FUEL PUMP CONTROL MODULE (FPCM)

Description INFOID:000000003977721

When driving conditions demand a decrease in fuel supply, the fuel pump control module (FPCM) reduces the supply voltage to the fuel pump. When driving conditions demand an increase in fuel supply (during engine start, low engine coolant temperature or high load), the supply voltage to the fuel pump is increased.



DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1220	Fuel pump control module (FPCM)	During engine cranking, the signal voltage of the FPCM to the ECM is too low.	Harness or connectors (FPCM circuit is open or shorted) (Fuel pump circuit is open or shorted) FPCM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

- Before performing the following procedure, confirm that battery voltage is between 12 15 V at idle.
- Before performing the following procedure, check that the engine coolant temperature is -10°C (14°F) or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- Start engine and let it idle for at least 5 seconds.
 If engine does not start, crank engine for at least 5 seconds.
- Check DTC.

Is DTC detected?

YES >> Go to EC-993, "Diagnosis Procedure".

NO >> INSPECTION END

4

Diagnosis Procedure

1. CHECK GROUND CONNECTION

- Turn ignition switch OFF.
 Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".
- Is the inspection result normal?

YES >> GO TO 2.

Revision: 2009 March

NO >> Repair or replace ground connection.

EC

Α

С

Е

D

F

Ы

L

Ν

С

INFOID:0000000003977723

P1220 FUEL PUMP CONTROL MODULE (FPCM)

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

2.check fpcm power supply circuit

- 1. Turn ignition switch OFF.
- 2. Disconnect FPCM harness connector.
- 3. Turn ignition switch ON.
- 4. Check the voltage between FPCM harness connector and ground.

FP	СМ	Ground	Voltage
Connector	Connector Terminal		voltage
B31	10	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4. NO >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B3, E121
- 15 A fuse (No.41)
- Harness for open or short between FPCM and IPDM E/R

>> Repair open circuit, short to ground or short to power in harness or connectors.

4. CHECK FPCM GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Check the continuity between FPCM harness connector and ground.

FP	CM	Ground	Continuity	
Connector Terminal		Ground	Continuity	
B31	5	Ground	Existed	

3. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit or short to power in harness or connectors.

5. CHECK FPCM INPUT AND OUTPUT CIRCUITS FOR OPEN AND SHORT

- Disconnect ECM harness connector.
- Check the continuity between FPCM harness connector and ECM harness connector.

FPCM		ECM		Continuity
Connector	Terminal	Connector	Terminal	Continuity
B31	8	M160	125	Existed
	9	IVITOO	112	LXISIEU

3. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B1, M7
- Harness for open or short between FPCM and ECM

>> Repair open circuit, short to ground or short to power in harness or connectors.

P1220 FUEL PUMP CONTROL MODULE (FPCM)

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

7.CHECK FUEL PUMP CONTROL CIRCUIT FOR OPEN AND SHORT

1. Disconnect "fuel level sensor unit and fuel pump (main)" harness connector.

Check the continuity between FPCM harness connector and "fuel level sensor unit and fuel pump (main)" harness connector.

FPCM Fuel level sensor unit and fuel pump (main)		Continuity		
Connector	Terminal	Connector Terminal		Continuity
B31	6	B22	3	Existed
D31	7	DZZ	1	Lxisted

3. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

8.CHECK FPCM

Refer to EC-995, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace FPCM.

9. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000003977724

1. CHECK FUEL PUMP CONTROL MODULE (FPCM)

1. Check the voltage between FPCM terminals under the following conditions.

	FPCM				
Connector	+	_	Condition	Voltage	
Terminal		Terminal		1	
		7 6	For 1 second after turning ignition switch ON	Approx. 8.5 V	
B31 7	7		More than 1 second after turning ignition switch ON	Approx. 0 V	
			Idle speed	Approx. 8.5 V	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace FPCM.

Revision: 2009 March **EC-995** 2009 FX35/FX50

EC

С

D

Е

F

F

G

Н

K

L

N/I

Ν

Р

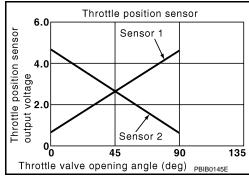
INFOID:0000000003958901

P1225, P1234 TP SENSOR

Description INFOID:000000004032247

Electric throttle control actuator consists of throttle control motor, throttle position sensor, etc. The throttle position sensor responds to the throttle valve movement.

The throttle position sensor has two sensors. These sensors are a kind of potentiometer which transform the throttle valve position into output voltage, and emit the voltage signal to the ECM. The ECM judges the current opening angle of the throttle valve from these signals and controls the throttle valve opening angle in response to driving conditions via the throttle control motor.



DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	
P1225	Closed throttle position learning performance (bank 1)	Closed throttle position learning value is	Electric throttle control actuator	
P1234	Closed throttle position learning performance (bank 2)	excessively low.	(TP sensor 1 and 2)	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10 V at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.
- 3. Turn ignition switch ON.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-996, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003958902

1. CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

- Turn ignition switch OFF.
- 2. Remove the intake air duct.

P1225, P1234 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

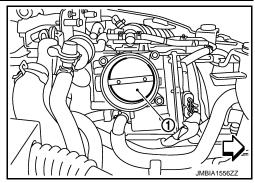
Check that no foreign matter is caught between the throttle valve (1) and the housing.

Is the inspection result normal?

YES >> GO TO 2.

NO

>> Remove the foreign matter and clean the electric throttle control actuator inside.



2. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

- Replace malfunctioning electric throttle control actuator.
- 2. Perform EC-997, "Special Repair Requirement".

>> INSPECTION END

Special Repair Requirement

1. PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Refer to EC-582, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement"

>> GO TO 2.

2.PERFORM IDLE AIR VOLUME LEARNING

Refer to EC-583, "IDLE AIR VOLUME LEARNING: Special Repair Requirement"

>> END

EC

Α

D

Е

INFOID:0000000004032248

Н

K

M

Ν

Р

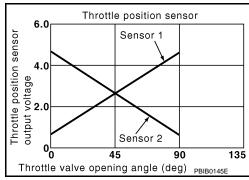
INFOID:0000000003958905

P1226, P1235 TP SENSOR

Description INFOID:000000004032249

Electric throttle control actuator consists of throttle control motor, throttle position sensor, etc. The throttle position sensor responds to the throttle valve movement.

The throttle position sensor has two sensors. These sensors are a kind of potentiometer which transform the throttle valve position into output voltage, and emit the voltage signal to the ECM. The ECM judges the current opening angle of the throttle valve from these signals and controls the throttle valve opening angle in response to driving conditions via the throttle control motor.



DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	
P1226	Closed throttle position learning performance (bank 1)	Closed throttle position learning is not	Electric throttle control actuator (TP sensor 1 and 2)	
P1235	Closed throttle position learning performance (bank 2)	performed successfully, repeatedly.		

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10 V at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.
- 3. Turn ignition switch ON.
- 4. Repeat steps 2 and 3 for 32 times.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-998, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003958906

1. CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

- 1. Turn ignition switch OFF.
- 2. Remove the intake air duct.

P1226, P1235 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Α

EC

D

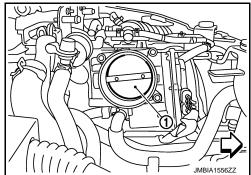
Е

3. Check that no foreign matter is caught between the throttle valve (1) and the housing.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Remove the foreign matter and clean the electric throttle control actuator inside.



2. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

- 1. Replace malfunctioning electric throttle control actuator.
- 2. Perform EC-999, "Special Repair Requirement".

>> INSPECTION END

Special Repair Requirement

INFOID:0000000004032250

1. PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Refer to EC-582, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement"

>> GO TO 2.

2. PERFORM IDLE AIR VOLUME LEARNING

Refer to EC-583, "IDLE AIR VOLUME LEARNING: Special Repair Requirement"

>> END

,

Н

J

K

M

Ν

O

Р

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

P1233, P2101 ELECTRIC THROTTLE CONTROL FUNCTION

Description

Electric throttle control actuator consists of throttle control motor, throttle position sensor, etc.

The throttle control motor is operated by the ECM and it opens and closes the throttle valve.

The current opening angle of the throttle valve is detected by the throttle position sensor. The throttle position sensor provides feedback to the ECM, when opens/closes the throttle valve in response to driving conditions via the throttle control motor.

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P1233 or P2101 is displayed with DTC P1238, P2119, first perform the trouble diagnosis for DTC P1238, P2119. Refer to EC-1007, "DTC Logic".

If DTC P1233 or P2101 is displayed with DTC P1290, P2100, first perform the trouble diagnosis for DTC P1290, P2100. Refer to EC-1012, "DTC Logic".

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1233	Electric throttle control performance (bank 2)	Electric throttle control function does not	Harness or connectors (Throttle control motor circuit is open or
P2101	Electric throttle control performance (bank 1)	operate properly.	shorted) • Electric throttle control actuator

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 11 V when engine is running.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Turn ignition switch ON and wait at least 2 seconds.
- 2. Start engine and let it idle for 5 seconds.
- Check DTC.

Is DTC detected?

YES >> Go to EC-1000, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003958910

1. CHECK GROUND CONNECTION

- Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK THROTTLE CONTROL MOTOR RELAY INPUT SIGNAL CIRCUIT-I

Check the voltage between ECM harness connector terminals as per the following.

Revision: 2009 March EC-1000 2009 FX35/FX50

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

		E	СМ							
DTC	+		_		Condition	Voltage (V)				
	Connector	Terminal	nal Connector Terminal							
P1233	F111	111 1		Ignition switch OFF	Approx. 0					
1 1233	1 111	'	M160	M160	M160	M160	M160	128	Ignition switch ON	Battery voltage
P2101	F110	49					120	Ignition switch OFF	Approx. 0	
F2101	P2101 F110 2	43		<u> </u>	Ignition switch ON	Battery voltage				

Is the inspection result normal?

YES >> GO TO 9. NO >> GO TO 3.

${f 3.}$ CHECK THROTTLE CONTROL MOTOR RELAY POWER SUPPLY CIRCUIT

- Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Disconnect IPDM E/R harness connector E7. 3.
- Check the continuity between IPDM E/R harness connector and ECM harness connector.

IPDM	E/R	EC	Continuity		
Connector Terminal		Connector Terminal		Continuity	
E7	70	F110	19	Existed	

5. Also check harness for short to ground and short to power.

Is the inspection result normal?

>> GO TO 5. YES NO >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E10, F10
- Harness for open or short between ECM and IPDM E/R

>> Repair open circuit, short to ground or short to power in harness or connectors.

5.CHECK THROTTLE CONTROL MOTOR RELAY INPUT SIGNAL CIRCUIT-II

Check the continuity between IPDM E/R harness connector and ECM harness connector.

DTC	IPDM	E/R	EC	Continuity	
ы	Connector	Terminal	Connector	Terminal	Continuity
P1233	F7	54	F111	1	Existed
P2101	Li	34	F110	49	LAISIEU

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 6.

O. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E10, F10
- Harness for open or short between ECM and IPDM E/R

>> Repair open circuit, short to ground or short to power in harness or connectors.

.CHECK FUSE

EC-1001 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

K

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

- 1. Disconnect 15 A fuse (No. 51) from IPDM E/R.
- 2. Check if 15 A fuse is blown.

Is the inspection result normal?

YES >> GO TO 8.

NO >> Replace 15 A fuse.

8. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace IPDM E/R.

NO >> Repair or replace harness or connectors.

9.check throttle control motor output signal circuit for open or short

- 1. Turn ignition switch OFF.
- 2. Disconnect electric throttle control actuator harness connector.
- 3. Disconnect ECM harness connector.
- Check the continuity between electric throttle control actuator harness connector and ECM harness connector.

DTC	Electri	c throttle cont	rol actuator	EC	CM	Continuity																				
ыс	Bank	Connector	Terminal Connec		Terminal	Continuity																				
			5	-		Not existed																				
P1233	2	F64		F111	5	Existed																				
F 1233	2	1 04		6	9	6	6	9	9	9	6	6	6	6	6	6	6	6	6	6	6	6	6	1 111	2	Existed
					5	Not existed																				
			5		5	5		50	Not existed																	
P2101	1	F66		F110	53	Existed																				
FZIUI	'	1 00		1110	50	Existed																				
			O		53	Not existed																				

5. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair or replace malfunctioning part.

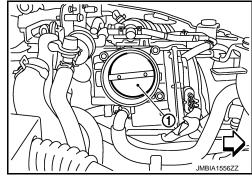
10. CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

- 1. Remove the intake air duct.
- 2. Check that no foreign matter is caught between the throttle valve (1) and the housing.

Is the inspection result normal?

YES >> GO TO 11.

NO >> Remove the foreign matter and clean the electric throttle control actuator inside.



11. CHECK THROTTLE CONTROL MOTOR

Refer to EC-1003, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 12. NO >> GO TO 13.

12. CHECK INTERMITTENT INCIDENT

[VK50VE] < DTC/CIRCUIT DIAGNOSIS > Refer to GI-35, "Intermittent Incident". Α Is the inspection result normal? YES >> GO TO 13. NO >> Repair or replace harness or connectors. 13. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR EC Replace malfunction electric throttle control actuator. Perform EC-1003, "Special Repair Requirement". >> INSPECTION END Component Inspection D INFOID:0000000003958916 CHECK THROTTLE CONTROL MOTOR Е Turn ignition switch OFF. Disconnect electric throttle control actuator harness connector. Check resistance between electric throttle control actuator terminals as per the following. F Electric throttle control actuator Resistance Bank Connector **Terminals** 1 F66 5 and 6 Approx. 1 - 15 Ω [at 25°C (77°F)] 2 F64 5 and 6 Is the inspection result normal? >> INSPECTION END YES NO >> GO TO 2. 2.replace electric throttle control actuator Replace malfunctioning electric throttle control actuator. Perform EC-1003, "Special Repair Requirement". >> INSPECTION END Special Repair Requirement INFOID:0000000004032253 1. PERFORM THROTTLE VALVE CLOSED POSITION LEARNING Refer to EC-582, "THROTTLE VALVE CLOSED POSITION LEARNING; Special Repair Requirement" >> GO TO 2. M 2.PERFORM IDLE AIR VOLUME LEARNING Refer to EC-583, "IDLE AIR VOLUME LEARNING: Special Repair Requirement" Ν >> END

Revision: 2009 March EC-1003 2009 FX35/FX50

P1236, P2118 THROTTLE CONTROL MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

P1236, P2118 THROTTLE CONTROL MOTOR

Description INFOID:000000003958913

The throttle control motor is operated by the ECM and it opens and closes the throttle valve.

The current opening angle of the throttle valve is detected by the throttle position sensor. The throttle position sensor provides feedback to the ECM, when opens/closes the throttle valve in response to driving conditions via the throttle control motor.

DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	
P1236	Throttle control motor (bank 2) circuit short	ECM detects short in both circuits between	Harness or connectors (Throttle control motor circuit is shorted.)	
P2118	Throttle control motor (bank 1) circuit short	ECM and throttle control motor.	Electric throttle control actuator (Throttle control motor)	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.perform dtc confirmation procedure

- 1. Turn ignition switch ON and wait at least 2 seconds.
- 2. Start engine and let it idle for 5 seconds.
- Check DTC.

Is DTC detected?

YES >> Go to EC-1004, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003958915

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- 2. Check ground connection M95. Refer to Ground Inspection in GI-38. "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.check throttle control motor output signal circuit for open and short

- 1. Disconnect electric throttle control actuator harness connector.
- Disconnect ECM harness connector.
- 3. Check the continuity between electric throttle control actuator harness connector and ECM harness connector.

P1236, P2118 THROTTLE CONTROL MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

DTC	Electric throttle control actuator ECM		Continuity				
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity	
			5		2	Not existed	
P1236	2	F64	5	F111	5	Existed	
F1230 2 F04	F04	6	FIII	2	Existed		
			0		5	Not existed	
			5		50	Not existed	
P2118	1	F66	5	F110	53	Existed	
F2110	'	F00	6	FIIU	50	Existed	
			0		53	Not existed	
_	•	air or replac OTTLE COI		• .	11.		
Is the insp		3, "Compor result norm ГО 4.	•	ction".			
_	> GO -	-					
4.CHEC	(INTE	RMITTENT	INCIDEN	I T			
Refer to G	il-35, "I	ntermittent	Incident"				
Is the insp	ection	result norm	nal?				
_NO >	-	air or replac					
5. REPLA	CE EL	ECTRIC TI	HROTTLE	CONTRO	L ACTUA	TOR	

Component Inspection

1. CHECK THROTTLE CONTROL MOTOR

>> INSPECTION END

- Turn ignition switch OFF.
- Disconnect electric throttle control actuator harness connector.

Replace malfunctioning electric throttle control actuator. Perform <u>EC-1006</u>, "Special Repair Requirement".

Check resistance between electric throttle control actuator terminals as per the following.

Resistance	Electric throttle control actuator				
resistance	Terminals	Bank Connector			
Approx. 1 - 15 Ω [at 25°C (77°F)]	5 and 6	F66	1		
Αρρίολ. 1 - 13 32 [αι 23 0 (77 1)]	5 and 6	F64	2		

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.replace electric throttle control actuator

- 1. Replace malfunctioning electric throttle control actuator.
- 2. Perform EC-1003, "Special Repair Requirement".

Revision: 2009 March **EC-1005** 2009 FX35/FX50

Ν

K

INFOID:0000000004032254

P1236, P2118 THROTTLE CONTROL MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

>> INSPECTION END

Special Repair Requirement

INFOID:0000000004032252

 ${\bf 1.} {\tt PERFORM\ THROTTLE\ VALVE\ CLOSED\ POSITION\ LEARNING}$

Refer to EC-582, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement"

>> GO TO 2.

2.PERFORM IDLE AIR VOLUME LEARNING

Refer to EC-583, "IDLE AIR VOLUME LEARNING: Special Repair Requirement"

>> END

P1238, P2119 ELECTRIC THROTTLE CONTROL ACTUATOR

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

P1238, P2119 ELECTRIC THROTTLE CONTROL ACTUATOR

Description INFOID:0000000003958918

Electric throttle control actuator consists of throttle control motor, throttle position sensor, etc.

The throttle control motor is operated by the ECM and it opens and closes the throttle valve.

The throttle position sensor detects the throttle valve position, and sends the voltage signal to the ECM. The ECM judges the current opening angle of the throttle valve from this signal and opens/closes the throttle valve in response to driving conditions via the throttle control motor.

DTC Logic INFOID:0000000003958919

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name		DTC detecting condition	Possible cause	
		A)	Electric throttle control actuator does not function properly due to the return spring malfunction.		
P1238	P1238 Electric throttle control actuator (bank 2)	Throttle valve opening angle in fail-safe mode is			
		C)	ECM detect that the throttle valve is stuck open.	Electric throttle control actuator	
		A)	Electric throttle control actuator does not function properly due to the return spring malfunction.	Clectric tillottle control actuator	
P2119 Electric throttle control actuator (bank 1)	B)	Throttle valve opening angle in fail-safe mode is not in specified range.			
			ECM detects that the throttle valve is stuck open.		

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 8 V at idle.

>> GO TO 2.

2.perform dtc confirmation procedure for malfunction a and b

- Turn ignition switch ON and wait at least 1 second.
- Shift selector lever position to D and wait at least 3 seconds.
- 3. Shift selector lever position to P.
- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON and wait at least 1 second.
- Shift selector lever position to D and wait at least 3 seconds.
- Shift selector lever position to P. 7.
- Turn ignition switch OFF, wait at least 10 seconds, and then turn ON.
- Check DTC.

Is DTC detected?

YES >> Go to EC-1008, "Diagnosis Procedure".

NO >> GO TO 3.

Revision: 2009 March

3.perform dtc confirmation procedure for malfunction ${ t c}$

- 1. Turn ignition switch ON and wait at least 1 second.
- 2. Shift selector lever position to D and wait at least 3 seconds.
- 3. Shift selector lever position to P.
- Start engine and let it idle for 3 seconds.

EC-1007 2009 FX35/FX50

EC

Α

D

Е

K

N

P1238, P2119 ELECTRIC THROTTLE CONTROL ACTUATOR

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

5. Check DTC.

Is DTC detected?

YES >> Go to EC-1008, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003958920

1. CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

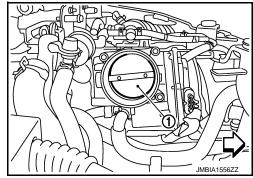
- Turn ignition switch OFF.
- Remove the intake air duct.
- 3. Check that no foreign matter is caught between the throttle valve (1) and the housing.

Is the inspection result normal?

YES >> GO TO 2.

NO

>> Remove the foreign matter and clean the electric throttle control actuator inside.



2. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

- 1. Replace malfunctioning electric throttle control actuator.
- 2. Perform EC-1008, "Special Repair Requirement".

>> INSPECTION END

Special Repair Requirement

INFOID:0000000004032251

1. PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Refer to EC-582, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement"

>> GO TO 2.

2. PERFORM IDLE AIR VOLUME LEARNING

Refer to EC-583, "IDLE AIR VOLUME LEARNING: Special Repair Requirement"

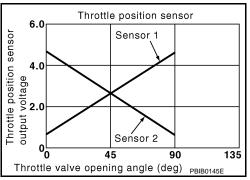
>> END

P1239, P2135 TP SENSOR

Description INFOID:0000000004032255

Electric throttle control actuator consists of throttle control motor, throttle position sensor, etc. The throttle position sensor responds to the throttle valve movement.

The throttle position sensor has two sensors. These sensors are a kind of potentiometer which transform the throttle valve position into output voltage, and emit the voltage signal to the ECM. The ECM judges the current opening angle of the throttle valve from these signals and controls the throttle valve opening angle in response to driving conditions via the throttle control motor.



DTC Logic INFOID:0000000003958923

DTC DETECTION LOGIC

NOTE:

If DTC P1239 or P2135 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. Refer to EC-959, "DTC Logic".

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1239	Throttle position sensor (bank 2) circuit range/ performance	Rationally incorrect voltage is sent to ECM compared with the signals from TP sensor 1	Harness or connector (Throttle position sensor 1 or 2 circuit is open or shorted.)
P2135	Throttle position sensor (bank 1) circuit range/ performance	and TP sensor 2.	Electric throttle control actuator (Throttle position sensor 1 or 2)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 8 V at idle.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- Start engine and let it idle for 1 second.
- Check DTC.

Is DTC detected?

YES >> Go to EC-1009, "Diagnosis Procedure".

>> INSPECTION END NO

Diagnosis Procedure

1. CHECK GROUND CONNECTION

- Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection". 2.

Is the inspection result normal?

YES >> GO TO 2.

EC-1009 Revision: 2009 March 2009 FX35/FX50

EC

Α

Е

F

Н

N

INFOID:0000000003958924

< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair or replace ground connection.

2.CHECK THROTTLE POSITION SENSOR POWER SUPPLY CIRCUIT-I

- 1. Disconnect electric throttle control actuator harness connector.
- 2. Turn ignition switch ON.
- Check the voltage between electric throttle control actuator harness connector and ground.

DTC	Electric throttle control actuator			Ground	Voltage (V)	
ыс	Bank	Connector	Terminal	Ground	voitage (v)	
P1239	2	F64	2	Ground	Approx. 5	
P2135	1	F66	2	Giodila	Αρρίοχ. 5	

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

3.check throttle position sensor ground circuit for open and short

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check the continuity between electric throttle control actuator harness connector and ECM harness connector.

DTC	Electric throttle control actuator		ECM		Continuity	
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity
P1239	2	F64	4	F111	72	Existed
P2135	1	F66	4	ГП	71	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

4. CHECK THROTTLE POSITION SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between electric throttle control actuator harness connector and ECM harness connector.

DTC	Electric throttle control actuator		ECM		Continuity	
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity
P1239	2	F64	1		77	
F 1239	2	F0 4	3	F111	74	Existed
P2135	1	1 F66	1		73	
F2133	ı	100	3		78	

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

5.CHECK THROTTLE POSITION SENSOR

Refer to EC-1011, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6.

6. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

1. Replace malfunctioning electric throttle control actuator.

Revision: 2009 March EC-1010 2009 FX35/FX50

P1239, P2135 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Α

EC

D

Е

F

Н

K

Ν

Р

2. Perform EC-1011, "Special Repair Requirement".

>> INSPECTION END

7. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000004032256

1. CHECK THROTTLE POSITION SENSOR

- 1. Turn ignition switch OFF.
- 2. Reconnect all harness connectors disconnected.
- 3. Perform EC-582, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement".
- 4. Turn ignition switch ON.
- Set selector lever position to D.
- 6. Check the voltage between ECM harness connector terminals under the following conditions.

	ECM			
Connector	+ -		Condition	Voltage (V)
Connector	Terminal	Terminal		
	73	71	Accelerator pedal: Fully released	More than 0.36
	[TP sensor 1 (bank 1)]		Accelerator pedal: Fully depressed	Less than 4.75
[TP se	77	72	Accelerator pedal: Fully released	More than 0.36
	[TP sensor 1 (bank 2)]	12	Accelerator pedal: Fully depressed	Less than 4.75
ГШ	78		Accelerator pedal: Fully released	Less than 4.75
[TP sensor 2 (bank 1)]		71	Accelerator pedal: Fully depressed	More than 0.36
	74	72	Accelerator pedal: Fully released	Less than 4.75
	[TP sensor 2 (bank 2)]	12	Accelerator pedal: Fully depressed	More than 0.36

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.replace electric throttle control actuator

- Replace malfunctioning electric throttle control actuator.
- 2. Perform EC-582, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement".

>> INSPECTION END

Special Repair Requirement

INFOID:0000000004032257

${f 1}$.PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Refer to EC-582, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement"

>> GO TO 2.

2.PERFORM IDLE AIR VOLUME LEARNING

Refer to EC-583, "IDLE AIR VOLUME LEARNING: Special Repair Requirement"

>> END

P1290, P2100, P2103 THROTTLE CONTROL MOTOR RELAY

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

INFOID:0000000003958929

P1290, P2100, P2103 THROTTLE CONTROL MOTOR RELAY

Description

Power supply for the throttle control motor is provided to the ECM via throttle control motor relay. The throttle control motor relay is controlled ON/OFF by the ECM. When the ignition switch is turned ON, the ECM sends an ON signal to throttle control motor relay and battery voltage is provided to the ECM. When the ignition switch is turned OFF, the ECM sends an OFF signal to throttle control motor relay and battery voltage is not provided to the ECM.

DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1290	Throttle control motor relay circuit open (bank 2)	ECM detects that the voltage of power source for throttle control motor is ex-	Harness or connectors (Throttle control motor relay circuit is open)
P2100	Throttle control motor relay circuit open (bank 1)	cessively low.	Throttle control motor relay
P2103	Throttle control motor relay circuit short	ECM detects that the throttle control motor relay is stuck ON.	Harness or connectors (Throttle control motor relay circuit is shorted) Throttle control motor relay

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 8 V at idle.

Which DTC is detected?

P1290, P2100>>GO TO 2.

P2103 >> GO TO 3.

2.PERFORM DTC CONFIRMATION PROCEDURE FOR DTC P1290 AND P2100

- 1. Turn ignition switch ON and wait at least 2 seconds.
- 2. Start engine and let it idle for 5 seconds.
- Check DTC.

Is DTC detected?

YES >> Go to EC-1012, "Diagnosis Procedure".

NO >> INSPECTION END

3.perform dtc confirmation procedure for dtc p2103 $\,$

- 1. Turn ignition switch ON and wait at least 1 second.
- 2. Check DTC.

Is DTC detected?

YES >> Go to EC-1012, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1. CHECK THROTTLE CONTROL MOTOR RELAY POWER SUPPLY CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Disconnect IPDM E/R harness connector E7.

Revision: 2009 March EC-1012 2009 FX35/FX50

P1290, P2100, P2103 THROTTLE CONTROL MOTOR RELAY

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Check the continuity between IPDM E/R harness connector and ECM harness connector.

IPDM	E/R	EC	Continuity	
Connector Terminal		Connector	Terminal	Continuity
E7	70	F110	19	Existed

EC

Α

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 3. NO >> GO TO 2.

D

2.DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E10, F10
- Harness for open or short between ECM and IPDM E/R

>> Repair open circuit, short to ground or short to power in harness or connectors.

3.check throttle control motor relay input signal circuit

Check the continuity between IPDM E/R sensor harness connector and ECM harness connector.

IPDM E/R **ECM** DTC Continuity Connector Terminal Connector **Terminal** F110 P1290 1 P2100 F111 49 **E7** 54 Existed F110 1 P2103 F111 49

Also check harness for short to ground and short to power.

Is the inspection result normal?

>> GO TO 5. YES NO >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E10, F10
- Harness for open or short between ECM and IPDM E/R

M

>> Repair open circuit, short to ground or short to power in harness or connectors.

5.CHECK FUSE

- 1. Disconnect 15 A fuse (No. 51) from IPDM E/R.
- Check if 15 A fuse is blown.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace 15 A fuse.

Refer to GI-35. "Intermittent Incident".

6.CHECK INTERMITTENT INCIDENT

Is the inspection result normal?

YES >> Replace IPDM E/R.

>> Repair or replace harness or connectors. NO

EC-1013 Revision: 2009 March 2009 FX35/FX50

Е

F

Н

K

Ν

P1421 COLD START CONTROL

Description INFOID:000000003958930

ECM controls ignition timing and engine idle speed when engine is started with pre-warming up condition. This control promotes the activation of three way catalyst by heating the catalyst and reduces emissions.

DTC Logic

DTC DETECTION LOGIC

NOTE:

• If DTC P1421 is displayed with other DTC, first perform the trouble diagnosis for other DTC.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1421	Cold start emission reduction strategy monitoring	ECM does not control ignition timing and engine idle speed properly when engine is started with pre-warming up condition.	Lack of intake air volumeFuel injection systemECM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 11 V at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- (P) With CONSULT-III
- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Select "DATA MONITOR" mode with CONSULT-III.
- Check the indication of "COOLAN TEMP/S".
 - If it is between 4°C (39°F) and 36°C (97°F), go to the following steps.
 - If it is below 4°C (39°F), warm engine up to more than 4°C (39°F) and retry from step 1.
 - If it is above 36°C (97°F), cool engine down to less than 36°C (97°F) and retry from step 1.
- 5. Start engine and let it idle for 5 minutes.
- Check 1st trip DTC.
- With GST

Follow the procedure "With CONSULT-III" above.

Is 1st trip DTC detected?

YES >> Go to EC-1014, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003958932

1.PERFORM IDLE AIR VOLUME LEARNING

Perform EC-583, "IDLE AIR VOLUME LEARNING: Special Repair Requirement".

Is Idle Air Volume Learning carried out successfully?

YES >> GO TO 2.

NO >> Follow the instruction of Idle Air Volume Learning.

2.CHECK INTAKE SYSTEM

Check for the cause of intake air volume lacking. Refer to the following.

P1421 COLD START CONTROL

P1421 COLD START CONTROL	
< DTC/CIRCUIT DIAGNOSIS > [VK50VE]	
Crushed intake air passageIntake air passage clogging	А
Is the inspection result normal?	/ \
YES >> GO TO 3.	
NO >> Repair or replace malfunctioning part	EC
3. CHECK FUEL INJECTION SYSTEM FUNCTION	
Perform DTC Confirmation Procedure for DTC P0171, P0174. Refer to EC-834, "DTC Logic".	С
Is the inspection result normal? YES >> GO TO 4.	
NO >> Go to EC-835. "Diagnosis Procedure" for DTC P0171, P0174.	D
4. PERFORM DTC CONFIRMATION PROCEDURE	
1. Turn ignition switch ON.	
 Erase DTC. Perform DTC Confirmation Procedure. 	Е
See EC-1014, "DTC Logic".	
Is the 1st trip DTC P1421 displayed again?	F
YES >> GO TO 5. NO >> INSPECTION END	
5. REPLACE ECM	G
1. Replace ECM.	
2. Perform EC-580, "ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT (ECM): Special Repair	ы
Requirement".	Н
>> INSPECTION END	
FF INC. Zerien Zinz	-
	J
	K
	11
	L
	\mathbb{N}
	Ν
	. 4
	0
	Р

Revision: 2009 March **EC-1015** 2009 FX35/FX50

P1550 BATTERY CURRENT SENSOR

Description INFOID:000000003958933

The power generation voltage variable control enables fuel consumption to be decreased by reducing the engine load which is caused by the power generation of the generator. The battery current sensor is installed to the battery cable at the negative terminal. The sensor measures the charging/discharging current of the battery. Based on the sensor signal, ECM judges whether or not the power generation voltage variable control is performed. When performing the power generation voltage variable control, ECM calculates the target power generation voltage based on the sensor signal. And ECM sends the calculated value as the power generation command value to IPDM E/R. For the details of the power generation voltage variable control, refer to CHG-8. "System Description".

CAUTION:

Never connect the electrical component or the ground wire directly to the battery terminal. The connection causes the malfunction of the power generation voltage variable control, and then battery discharge may occur.

DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1550	Battery current sensor circuit range/performance	The output voltage of the battery current sensor remains within the specified range while engine is running.	Harness or connectors (Battery current sensor circuit is open or shorted.) (Accelerator pedal position sensor 2 circuit is shorted.) [Camshaft position sensor (bank 1) circuit is shorted.] (Crankshaft position sensor circuit is shorted.) (EVAP control system pressure sensor circuit is shorted.) [Exhaust valve timing control position sensor (bank 1) circuit is shorted.] (Manifold pressure sensor circuit is shorted.) Battery current sensor Accelerator pedal position sensor Camshaft position sensor (bank 1) Crankshaft position sensor EVAP control system pressure sensor Exhaust valve timing control position sensor (bank 1) Manifold pressure sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 8 V at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine and let it idle for at least 10 seconds.
- 2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-1017, "Diagnosis Procedure".

NO >> INSPECTION END

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Diagnosis Procedure

INFOID:0000000003958935

1. CHECK GROUND CONNECTION

- Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK BATTERY CURRENT SENSOR POWER SUPPLY CIRCUIT-I

- Disconnect battery current sensor harness connector.
- 2. Turn ignition switch ON.
- Check the voltage between battery current sensor harness connector and ground.

Battery cur	rent sensor	Ground	Voltage (V)	
Connector Terminal		Ground	voitage (v)	
E21	1	Ground	Approx. 5	

Is the inspection result normal?

YES >> GO TO 9.

NO >> GO TO 3.

${f 3.}$ CHECK BATTERY CURRENT SENSOR POWER SUPPLY CIRCUIT-II

- Turn ignition switch OFF.
- Disconnect ECM harness connector. 2.
- Check the continuity between battery current sensor harness connector and ECM harness connector.

Battery curr	ent sensor	EC	Continuity	
Connector	Terminal	Connector Terminal		Continuity
E21	1	F111	95	Existed

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

f 4.DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F10, E10
- Harness for open between battery current sensor and ECM

>> Repair open circuit.

5. CHECK SENSOR POWER SUPPLY CIRCUIT

Check harness for short to power and short to ground, between the following terminals.

ECM		Sensor				
Connector	Terminal	Name	Connector	Terminal		
	87	Crankshaft position sensor	F2	1		
	91	Camshaft position sensor (bank 1)	F84	1		
F111	31	EVT control position sensor (bank 1)	F59	1		
FIII	95	Battery current sensor	E21	1		
		95 EVAP control system pressure sensor		B252	3	
		Manifold pressure sensor	F65	1		

EC-1017 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

E	CM	Sensor		
Connector	Terminal	Name	Connector	Terminal
M160	99	APP sensor (Without ICC)	E112	6
WHOO	99	APP sensor (with ICC)	E116	3

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair short to ground or short to power in harness or connectors.

6. CHECK COMPONENTS

Check the following.

- Crankshaft position sensor (Refer to EC-870, "Component Inspection".)
- Camshaft position sensor (bank 1) (Refer to EC-875, "Component Inspection".)
- Exhaust valve timing control position sensor (bank 1) (Refer to EC-972, "Component Inspection".)
- EVAP control system pressure sensor (Refer to EC-911, "Component Inspection".)
- Manifold pressure sensor (Refer to EC-1115, "Component Inspection".)

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace malfunctioning component.

7. CHECK APP SENSOR

Refer to EC-1074, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 14. NO >> GO TO 8.

8.replace accelerator pedal assembly

- Replace accelerator pedal assembly.
- 2. Perform EC-1075, "Special Repair Requirement".

>> INSPECTION END

9. CHECK BATTERY CURRENT SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- Disconnect ECM harness connector.
- 3. Check the continuity between battery current sensor harness connector and ECM harness connector.

Battery current sensor		EC	Continuity	
Connector	Terminal	Connector	Terminal	Continuity
E21	2	F111	70	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 11. NO >> GO TO 10.

10.DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F10, E10
- Harness for open or short between battery current sensor and ECM

>> Repair open circuit, short to ground or short to power in harness or connectors.

11. CHECK BATTERY CURRENT SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between battery current sensor harness connector and ECM harness connector.

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Battery current sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E21	3	F111	76	Existed

Also check harness for short to ground and short to power.

Is the inspection result normal?

>> GO TO 13. YES NO >> GO TO 12.

12. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F10, E10
- Harness for open or short between battery current sensor and ECM

>> Repair open circuit, short to ground or short to power in harness or connectors.

13. CHECK BATTERY CURRENT SENSOR

Refer to EC-1019, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 14.

NO >> Replace battery negative cable assembly.

14. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

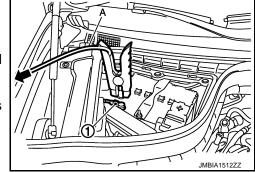
1. CHECK BATTERY CURRENT SENSOR

- Turn ignition switch OFF.
- Reconnect harness connectors disconnected.
- Disconnect battery negative cable (1).

To body ground

- Install jumper cable (A) between battery negative terminal and body ground.
- 5. Turn ignition switch ON.
- 6. Check the voltage between ECM harness connector terminals under the following conditions.

Connector	+	_	Voltage (V)
Connector	Terminal	Terminal	
F111	76 (Battery current sensor signal)	70	Approx. 2.5



Before measuring the terminal voltage, confirm that the battery is fully charged. Refer to PG-3. "How to Handle Battery".

Is the inspection result normal?

YES >> INSPECTION END

>> Replace battery negative cable assembly. NO

EC-1019 Revision: 2009 March 2009 FX35/FX50

EC

Α

Е

INFOID:0000000003958936

K

N

P1551, P1552 BATTERY CURRENT SENSOR

Description INFOID:000000004032258

The power generation voltage variable control enables fuel consumption to be decreased by reducing the engine load which is caused by the power generation of the generator. The battery current sensor is installed to the battery cable at the negative terminal. The sensor measures the charging/discharging current of the battery. Based on the sensor signal, ECM judges whether or not the power generation voltage variable control is performed. When performing the power generation voltage variable control, ECM calculates the target power generation voltage based on the sensor signal. And ECM sends the calculated value as the power generation command value to IPDM E/R. For the details of the power generation voltage variable control, refer to CHG-8, <a href=""System Description".

CAUTION:

Never connect the electrical component or the ground wire directly to the battery terminal. The connection causes the malfunction of the power generation voltage variable control, and then battery discharge may occur.

DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1551	Battery current sensor circuit low input	An excessively low voltage from the sensor is sent to ECM.	Harness or connectors (Battery current sensor circuit is open or shorted.)
P1552	Battery current sensor circuit high input	An excessively high voltage from the sensor is sent to ECM.	(Accelerator pedal position sensor 2 circuit is shorted.) [Camshaft position sensor (bank 1) circuit is shorted.] (Crankshaft position sensor circuit is shorted.) (EVAP control system pressure sensor circuit is shorted.) [Exhaust valve timing control position sensor (bank 1) circuit is shorted.] (Manifold pressure sensor circuit is shorted.) Battery current sensor Accelerator pedal position sensor Camshaft position sensor (bank 1) Crankshaft position sensor EVAP control system pressure sensor Exhaust valve timing control position sensor (bank 1) Manifold pressure sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 8 V with ignition switch ON

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Turn ignition switch ON and wait at least 10 seconds.
- Check 1st trip DTC.

Is 1st trip DTC detected?

P1551, P1552 BATTERY CURRENT SENSOR

[VK50VE] < DTC/CIRCUIT DIAGNOSIS > YES >> Go to EC-1021, "Diagnosis Procedure". NO >> INSPECTION END Α Diagnosis Procedure INFOID:0000000004062680 1. CHECK GROUND CONNECTION EC Turn ignition switch OFF. Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection". Is the inspection result normal? YES >> GO TO 2. NO >> Repair or replace ground connection. D 2.CHECK BATTERY CURRENT SENSOR POWER SUPPLY CIRCUIT-I Disconnect battery current sensor harness connector. Turn ignition switch ON. Е Check the voltage between battery current sensor harness connector and ground. Battery current sensor F Ground Voltage (V) Connector **Terminal** E21 Ground Approx. 5 Is the inspection result normal? YFS >> GO TO 9. NO >> GO TO 3. Н ${f 3.}$ CHECK BATTERY CURRENT SENSOR POWER SUPPLY CIRCUIT-II Turn ignition switch OFF. 2. Disconnect ECM harness connector. Check the continuity between battery current sensor harness connector and ECM harness connector. Battery current sensor **ECM** Continuity Connector Terminal Connector Terminal E21 F111 95 Existed Is the inspection result normal? YES >> GO TO 5. NO >> GO TO 4. 4. DETECT MALFUNCTIONING PART Check the following. Harness connectors F10, E10 Harness for open between battery current sensor and ECM Ν >> Repair open circuit. ${f 5.}$ CHECK SENSOR POWER SUPPLY CIRCUIT Check harness for short to power and short to ground, between the following terminals. Р

ECM		Sensor			
Connector	Terminal	Name	Connector	Terminal	
	87	Crankshaft position sensor	F2	1	
	91	Camshaft position sensor (bank 1)	F84	1	
F111		EVT control position sensor (bank 1)	F59	1	
ГШ	95	Battery current sensor	E21	1	
		95	EVAP control system pressure sensor	B252	3
		Manifold pressure sensor	F65	1	
M160	99	APP sensor (Without ICC)	E112	6	
IVI 1 0 0	39	APP sensor (with ICC)	E116	3	

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair short to ground or short to power in harness or connectors.

6. CHECK COMPONENTS

Check the following.

- Crankshaft position sensor (Refer to EC-870, "Component Inspection".)
- Camshaft position sensor (bank 1) (Refer to EC-875, "Component Inspection".)
- Exhaust valve timing control position sensor (bank 1) (Refer to EC-972, "Component Inspection".)
- EVAP control system pressure sensor (Refer to EC-911. "Component Inspection".)
- Manifold pressure sensor (Refer to <u>EC-1115</u>, "Component Inspection".)

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace malfunctioning component.

7. CHECK APP SENSOR

Refer to EC-1074, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 14. NO >> GO TO 8.

8.replace accelerator pedal assembly

- Replace accelerator pedal assembly.
- Perform <u>EC-1075</u>, "Special Repair Requirement".

>> INSPECTION END

9. CHECK BATTERY CURRENT SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check the continuity between battery current sensor harness connector and ECM harness connector.

٠	Battery current sensor		tery current sensor ECM		Continuity
	Connector	Terminal	Connector	Terminal	Continuity
•	E21	2	F111	70	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 11. NO >> GO TO 10.

10.DETECT MALFUNCTIONING PART

Check the following.

P1551, P1552 BATTERY CURRENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

• Harness connectors F10, E10

Harness for open or short between battery current sensor and ECM

[VK50VE]

>> Repair open circuit, short to ground or short to power in harness or connectors.

11. CHECK BATTERY CURRENT SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

Check the continuity between battery current sensor harness connector and ECM harness connector.

Battery current sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E21	3	F111	76	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 13.

NO >> GO TO 12.

12. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F10, E10
- Harness for open or short between battery current sensor and ECM

>> Repair open circuit, short to ground or short to power in harness or connectors.

13. CHECK BATTERY CURRENT SENSOR

Refer to EC-1023, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 14.

NO >> Replace battery negative cable assembly.

14. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

1. CHECK BATTERY CURRENT SENSOR

- Turn ignition switch OFF.
- Reconnect harness connectors disconnected.
- Disconnect battery negative cable (1).
 - To body ground
- 4. Install jumper cable (A) between battery negative terminal and body ground.
- Turn ignition switch ON.

Revision: 2009 March

6. Check the voltage between ECM harness connector terminals under the following conditions.

Connector	+	_	Voltage (V)
Connector	Terminal	Terminal	
F111	76 (Battery current sensor signal)	70	Approx. 2.5

Before measuring the terminal voltage, confirm that the battery is fully charged. Refer to PG-3. "How to Handle Battery".

EC-1023 2009 FX35/FX50 EC

Α

Е

Н

M

N

Р

INFOID:0000000004024079

P1551, P1552 BATTERY CURRENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace battery negative cable assembly.

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

P1553 BATTERY CURRENT SENSOR

Description

The power generation voltage variable control enables fuel consumption to be decreased by reducing the engine load which is caused by the power generation of the generator. The battery current sensor is installed to the battery cable at the negative terminal. The sensor measures the charging/discharging current of the battery. Based on the sensor signal, ECM judges whether or not the power generation voltage variable control is performed. When performing the power generation voltage variable control, ECM calculates the target power generation voltage based on the sensor signal. And ECM sends the calculated value as the power generation command value to IPDM E/R. For the details of the power generation voltage variable control, refer to CHG-8, "System Description".

CAUTION:

Never connect the electrical component or the ground wire directly to the battery terminal. The connection causes the malfunction of the power generation voltage variable control, and then battery discharge may occur.

DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1553	Battery current sensor performance	The signal voltage transmitted from the sensor to ECM is higher than the amount of the maximum power generation.	Harness or connectors (Battery current sensor circuit is open or shorted.) (Accelerator pedal position sensor 2 circuit is shorted.) [Camshaft position sensor (bank 1) circuit is shorted.] (Crankshaft position sensor circuit is shorted.) (EVAP control system pressure sensor circuit is shorted.) [Exhaust valve timing control position sensor (bank 1) circuit is shorted.] (Manifold pressure sensor circuit is shorted.) Battery current sensor Accelerator pedal position sensor Camshaft position sensor (bank 1) Crankshaft position sensor EVAP control system pressure sensor Exhaust valve timing control position sensor (bank 1) Manifold pressure sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 8 V at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine and let it idle for least 10 seconds.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-1026, "Diagnosis Procedure".

Revision: 2009 March EC-1025 2009 FX35/FX50

EC

Α

C

D

Е

F

.

K

IV

Ν

Р

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000004062681

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- 2. Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK BATTERY CURRENT SENSOR POWER SUPPLY CIRCUIT-I

- 1. Disconnect battery current sensor harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between battery current sensor harness connector and ground.

Battery cur	rent sensor	Ground	Voltage (V)
Connector	Terminal	Glound	voltage (v)
E21	1	Ground	Approx. 5

Is the inspection result normal?

YES >> GO TO 9.

NO >> GO TO 3.

3.check battery current sensor power supply circuit-ii

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check the continuity between battery current sensor harness connector and ECM harness connector.

Battery curr	Battery current sensor		urrent sensor ECM		Continuity
Connector	Terminal	Connector Terminal		Continuity	
E21	1	F111	95	Existed	

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F10, E10
- · Harness for open between battery current sensor and ECM

>> Repair open circuit.

5. CHECK SENSOR POWER SUPPLY CIRCUIT

Check harness for short to power and short to ground, between the following terminals.

EC	CM	Sensor		
Connector	Terminal	Name	Connector	Terminal
87		Crankshaft position sensor	F2	1
91 F111 95	Camshaft position sensor (bank 1)	F84	1	
	91	EVT control position sensor (bank 1)	F59	1
	Battery current sensor	E21	1	
	95	EVAP control system pressure sensor	B252	3
		Manifold pressure sensor	F65	1

[VK50VF]

0

Р

DTC/CIR	RCUIT DIA	AGNOSIS	>				[VK50VE]		
EC	M			Sensor					
Connector	Terminal		Name		Connector	Terminal	_		
M160	99	APP senso	r (Without IC	C)	E112	6	_		
WITOO	55	APP senso	r (with ICC)		E116	3	- -		
YES >> NO >>	O TO	hort to gro	_	ort to power i	n harness or	connectors	S.		
heck the	following.		Refer to E	C-870, "Comp	onent Inspe	ction".)			
Camshaf Exhaust v EVAP col Manifold	t position valve timii ntrol syste pressure	sensor (bang control em pressur sensor (Re	ink 1) (Re position se e sensor efer to <u>EC</u>	fer to <u>EC-875</u>	. "Compone) (Refer to <u>E</u> 911, "Compo	nt Inspection C-972, "Connent Inspe	omponent Inspection".)		
YES >>	O TO	ult normal? 7. malfunctio	-	ponent.					
.CHECK	APP SE	NSOR							
		Componen	-	<u>n"</u> .					
-		<u>ult normal?</u>) -						
	> GO TO : > GO TO :								
_			PEDAL A	SSEMBLY					
		ator pedal							
				<u>equirement"</u> .					
>>	> INSPEC	TION END)						
.CHECK	BATTER	Y CURREI	NT SENS	OR GROUNE	CIRCUIT F	OR OPEN	AND SHORT		
	nition swi								
Discon	nect ECN	1 harness					LEONAL		
Check	the contir	nuity betwe	en batter	current sens	sor harness (connector a	and ECM harness connector.		
Battery curr	ent sensor	EC	CM						
Connector	Terminal	Connector	Terminal	Continuity					
E21	2	F111	70	Existed					
				nd and short	to power				
		ult normal?	_		•				
/ES >>	SO TO	11.							

>> GO TO 11. >> GO TO 10.

10. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F10, E10
- Harness for open or short between battery current sensor and ECM

>> Repair open circuit, short to ground or short to power in harness or connectors.

11. CHECK BATTERY CURRENT SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between battery current sensor harness connector and ECM harness connector.

< DTC/CIRCUIT DIAGNOSIS >

Battery current sensor		EC	Continuity	
Connector	Terminal	Connector Terminal		Continuity
E21	3	F111	76	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 13. NO >> GO TO 12.

12. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F10, E10
- Harness for open or short between battery current sensor and ECM

>> Repair open circuit, short to ground or short to power in harness or connectors.

13. CHECK BATTERY CURRENT SENSOR

Refer to EC-1028, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 14.

NO >> Replace battery negative cable assembly.

14. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000004024081

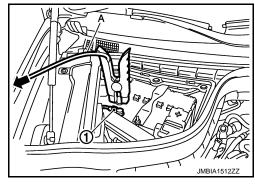
1. CHECK BATTERY CURRENT SENSOR

- 1. Turn ignition switch OFF.
- 2. Reconnect harness connectors disconnected.
- 3. Disconnect battery negative cable (1).

To body ground

- 4. Install jumper cable (A) between battery negative terminal and body ground.
- 5. Turn ignition switch ON.
- 6. Check the voltage between ECM harness connector terminals under the following conditions.

Connector	+	_	Voltage (V)
Connector	Terminal	Terminal	
F111	76 (Battery current sensor signal)	70	Approx. 2.5



Before measuring the terminal voltage, confirm that the battery is fully charged. Refer to PG-3, "How to Handle Battery".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace battery negative cable assembly.

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

P1554 BATTERY CURRENT SENSOR

Description INFOID:0000000004032260

The power generation voltage variable control enables fuel consumption to be decreased by reducing the engine load which is caused by the power generation of the generator. The battery current sensor is installed to the battery cable at the negative terminal. The sensor measures the charging/discharging current of the battery. Based on the sensor signal, ECM judges whether or not the power generation voltage variable control is performed. When performing the power generation voltage variable control, ECM calculates the target power generation voltage based on the sensor signal. And ECM sends the calculated value as the power generation command value to IPDM E/R. For the details of the power generation voltage variable control, refer to CHG-8, "System Description".

CAUTION:

Never connect the electrical component or the ground wire directly to the battery terminal. The connection causes the malfunction of the power generation voltage variable control, and then battery discharge may occur.

DTC Logic INFOID:0000000003958946

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1554	Battery current sensor performance	The output voltage of the battery current sensor is lower than the specified value while the battery voltage is high enough.	Harness or connectors (Battery current sensor circuit is open or shorted.) (Accelerator pedal position sensor 2 circuit is shorted.) [Camshaft position sensor (bank 1) circuit is shorted.] (Crankshaft position sensor circuit is shorted.) (EVAP control system pressure sensor circuit is shorted.) [Exhaust valve timing control position sensor (bank 1) circuit is shorted.] (Manifold pressure sensor circuit is shorted.) Battery current sensor Accelerator pedal position sensor Camshaft position sensor (bank 1) Crankshaft position sensor EVAP control system pressure sensor Exhaust valve timing control position sensor (bank 1) Manifold pressure sensor

DTC CONFIRMATION PROCEDURE

1. PERFORM COMPONENT FUNCTION CHECK

Perform Component Function Check. Refer to EC-1029, "Component Function Check". NOTE:

Use Component Function Check to check the overall function of the battery current sensor circuit. During this check, a 1st trip DTC might not be confirmed.

Is the inspection result normal?

YFS >> INSPECTION END

NO >> Go to EC-1030, "Diagnosis Procedure".

Component Function Check

1.PRECONDITIONING

TESTING CONDITION:

- Before performing the following procedure, confirm that battery voltage is more than 12.8 V at idle.
- Before performing the following procedure, confirm that all load switches and A/C switch are turned OFF.

>> GO TO 2.

EC-1029 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

F

M

N

INFOID:0000000003958947

< DTC/CIRCUIT DIAGNOSIS >

2.perform component function check

(II) With CONSULT-III

- 1. Start engine and let it idle.
- 2. Select "BAT CUR SEN" in "DATA MONITOR" mode with CONSULT-III.
- 3. Check "BAT CUR SEN" indication for 10 seconds.

"BAT CUR SEN" should be above 2,300 mV at least once.

Nithout CONSULT-III

- 1. Start engine and let it idle.
- 2. Check the voltage between ECM harness connector terminals as per the following.

	ECM		
Connector	+	-	Voltage (V)
Connector	Terminal	Terminal	
F111	76 (Battery current sensor signal)	70	Above 2.3 at least once

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-1030, "Diagnosis Procedure".

Diagnosis Procedure

gnosis procedure

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- 2. Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2. CHECK BATTERY CURRENT SENSOR POWER SUPPLY CIRCUIT-I

- 1. Disconnect battery current sensor harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between battery current sensor harness connector and ground.

Battery cur	rent sensor	Ground	Voltage (V)	
Connector Terminal		Giodila	voitage (v)	
E21	1	Ground	Approx. 5	

Is the inspection result normal?

YES >> GO TO 9.

NO >> GO TO 3.

3.check battery current sensor power supply circuit-ii

- Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check the continuity between battery current sensor harness connector and ECM harness connector.

Battery current sensor		EC	Continuity		
Connector	Terminal	Connector Terminal		Continuity	
E21	1	F111	95	Existed	

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4. DETECT MALFUNCTIONING PART

< DTC/CIRCUIT DIAGNOSIS >

Check the following.

- Harness connectors F10, E10
- Harness for open between battery current sensor and ECM

>> Repair open circuit.

5.check sensor power supply circuit

Check harness for short to power and short to ground, between the following terminals.

EC	CM	Sensor	Sensor		
Connector	Terminal	Name	Connector	Terminal	
87 Cı		Crankshaft position sensor	F2	1	
91 F111 95	01	Camshaft position sensor (bank 1)	F84	1	
	91	EVT control position sensor (bank 1)	F59	1	
	95	Battery current sensor	E21	1	
		95 EVAP control system pressure sensor		B252	3
		Manifold pressure sensor	F65	1	
M160	99	APP sensor (Without ICC)	E112	6	
101100	39	APP sensor (with ICC)	E116	3	

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair short to ground or short to power in harness or connectors.

6. CHECK COMPONENTS

Check the following.

- Crankshaft position sensor (Refer to <u>EC-870, "Component Inspection"</u>.)
- Camshaft position sensor (bank 1) (Refer to EC-875, "Component Inspection".)
- Exhaust valve timing control position sensor (bank 1) (Refer to EC-972, "Component Inspection".)
- EVAP control system pressure sensor (Refer to EC-911, "Component Inspection".)
- Manifold pressure sensor (Refer to <u>EC-1115</u>, "Component Inspection".)

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace malfunctioning component.

.CHECK APP SENSOR

Refer to EC-1074, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 14.

NO >> GO TO 8.

8.REPLACE ACCELERATOR PEDAL ASSEMBLY

- Replace accelerator pedal assembly.
- Perform EC-1075, "Special Repair Requirement".

>> INSPECTION END

9.check battery current sensor ground circuit for open and short

- Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check the continuity between battery current sensor harness connector and ECM harness connector.

Battery current sensor		ECM		Continuity	
Connector	Terminal	Connector Terminal		Continuity	
E21	2	F111	70	Existed	

EC-1031 Revision: 2009 March 2009 FX35/FX50

EC

Α

[VK50VE]

Е

D

M

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 11. NO >> GO TO 10.

10. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F10, E10
- · Harness for open or short between battery current sensor and ECM
 - >> Repair open circuit, short to ground or short to power in harness or connectors.

11. CHECK BATTERY CURRENT SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between battery current sensor harness connector and ECM harness connector.

Battery current sensor		EC	Continuity	
Connector	Terminal	Connector Terminal		Continuity
E21	3	F111	76	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 13. NO >> GO TO 12.

12. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F10, E10
- · Harness for open or short between battery current sensor and ECM

>> Repair open circuit, short to ground or short to power in harness or connectors.

13. CHECK BATTERY CURRENT SENSOR

Refer to EC-1032. "Component Inspection".

Is the inspection result normal?

YES >> GO TO 14.

NO >> Replace battery negative cable assembly.

14. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000004024082

2009 FX35/FX50

1. CHECK BATTERY CURRENT SENSOR

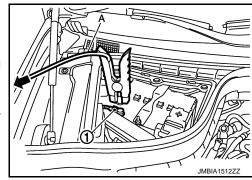
- 1. Turn ignition switch OFF.
- 2. Reconnect harness connectors disconnected.

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

- 3. Disconnect battery negative cable (1).
 - To body ground
- 4. Install jumper cable (A) between battery negative terminal and body ground.
- 5. Turn ignition switch ON.
- 6. Check the voltage between ECM harness connector terminals under the following conditions.

Connector	+	_	Voltage (V)
Connector	Terminal	Terminal	
F111	76 (Battery current sensor signal)	70	Approx. 2.5



Before measuring the terminal voltage, confirm that the battery is fully charged. Refer to PG-3, "How to Handle Battery".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace battery negative cable assembly.

Α

EC

D

C

Е

F

G

Н

K

L

M

Ν

0

Р

P1564 ASCD STEERING SWITCH

Description

ASCD steering switch has variant values of electrical resistance for each button. ECM reads voltage variation of switch, and determines which button is operated.

Refer to EC-632, "System Description" for the ASCD function.

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P1564 is displayed with DTC P0605, first perform the trouble diagnosis for DTC P0605. Refer to EC-956, "DTC Logic".

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1564	ASCD steering switch	 An excessively high voltage signal from the ASCD steering switch is sent to ECM. ECM detects that input signal from the ASCD steering switch is out of the specified range. ECM detects that the ASCD steering switch is stuck ON. 	Harness or connectors (The switch circuit is open or shorted.) ASCD steering switch ECM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.perform dtc confirmation procedure

- 1. Turn ignition switch ON and wait at least 10 seconds.
- 2. Press MAIN switch for at least 10 seconds, then release it and wait at least 10 seconds.
- 3. Press CANCEL switch for at least 10 seconds, then release it and wait at least 10 seconds.
- Press RESUME/ACCELERATE switch for at least 10 seconds, then release it and wait at least 10 seconds.
- 5. Press SET/COAST switch for at least 10 seconds, then release it and wait at least 10 seconds.
- 6. Check DTC.

Is DTC detected?

YES >> Go to EC-1034, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003958952

1. CHECK GROUND CONNECTION

- Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2. CHECK ASCD STEERING SWITCH CIRCUIT

- (P) With CONSULT-III
- 1. Turn ignition switch ON.

P1564 ASCD STEERING SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

- 2. Select "MAIN SW", "CANCEL SW", "RESUME/ACC SW" and "SET SW" in "DATA MONITOR" mode with CONSULT-III.
- 3. Check each item indication under the following conditions.

Monitor item	Condition		Indication
MAIN SW	MAIN switch	Pressed	ON
WAIN OW	IVIAIIV SWITCH	Released	OFF
CANCEL SW	CANCEL switch	Pressed	ON
CANCLL SW	CANCLE SWITCH	Released	OFF
RESUME/ACC SW	RESUME/ACCELERATE	Pressed	ON
RESONE/ACC SW	switch	Released	OFF
SFT SW	SET/COAST switch	Pressed	ON
<u></u>	SE 1700AST SWITCH	Released	OFF

₩ Without CONSULT-III

- Turn ignition switch ON.
- 2. Check the voltage between ECM harness connector terminals under the following conditions.

	ECM			
Connector	+	_	Condition	Voltage (V)
Connector	Terminal	Terminal		
			MAIN switch: Pressed	Approx. 0
	102 (ASCD steering switch signal)	111	CANCEL switch: Pressed	Approx. 1
M160			SET/COAST switch: Pressed	Approx. 2
			RESUME/ACCELERATE switch: Pressed	Approx. 3
			All ASCD steering switches: Released	Approx. 4

Is the inspection result normal?

YES >> GO TO 8.

NO >> GO TO 3.

3.check ascd steering switch ground circuit for open and short

- 1. Turn ignition switch OFF.
- Disconnect ECM harness connector.
- 3. Disconnect combination switch harness connector.
- Check the continuity between combination switch and ECM harness connector.

Combination switch		ECM		Continuity
Connector	Terminal	Connector	Terminal	Continuity
_	16	M160	111	Existed

5. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Combination switch (spiral cable)
- · Harness for open and short between ECM and combination switch

>> Repair open circuit, short to ground or short to power in harness or connectors.

 ${f 5.}$ CHECK ASCD STEERING SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

EC

Α

D

Е

F

ш

Κ

N

Ν

0

P

P1564 ASCD STEERING SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Check the continuity between combination switch and ECM harness connector.

Combination switch		ECM		Continuity
Connector	Terminal	Connector	Terminal	Continuity
_	13	M160	102	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Combination switch (spiral cable)
- · Harness for open and short between ECM and combination switch

>> Repair open circuit, short to ground or short to power in harness or connectors.

7. CHECK ASCD STEERING SWITCH

Refer to EC-1036, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 8.

NO >> Replace ASCD steering switch.

8.CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000003958953

1. CHECK ASCD STEERING SWITCH

- 1. Turn ignition switch OFF.
- 2. Disconnect combination switch (spiral cable) harness connector M303.
- 3. Check resistance between combination switch harness connector terminals under the following conditions.

Combination switch		Condition	Resistance (Ω)	
Connector	Terminals	Condition	116313ta1106 (22)	
		MAIN switch: Pressed	Approx. 0	
		CANCEL switch: Pressed	Approx. 250	
M303	13 and 16	SET/COAST switch: Pressed	Approx. 660	
		RESUME/ACCELERATE switch: Pressed	Approx. 1,480	
		All ASCD steering switches: Released	Approx. 4,000	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace ASCD steering switch

P1564 ICC STEERING SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

P1564 ICC STEERING SWITCH

Description INFOID:0000000003958954

ICC steering switch has variant values of electrical resistance for each button. ECM reads voltage variation of switch, and determines which button is operated.

Refer to CCS-24, "System Description" for the ICC function.

DTC Logic INFOID:0000000003958955

DTC DETECTION LOGIC

If DTC P1564 is displayed with DTC P0605, first perform the trouble diagnosis for DTC P0605. Refer to EC-956, "DTC Logic".

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1564	ICC steering switch	 An excessively high voltage signal from the ICC steering switch is sent to ECM. ECM detects that input signal from the ICC steering switch is out of the specified range. ECM detects that the ICC steering switch is stuck ON. 	_

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.perform dtc confirmation procedure

- Turn ignition switch ON and wait at least 10 seconds.
- Press MAIN switch for at least 10 seconds, then release it and wait at least 10 seconds.
- Press CANCEL switch for at least 10 seconds, then release it and wait at least 10 seconds.
- Press RESUME/ACCELERATE switch for at least 10 seconds, then release it and wait at least 10 seconds.
- Press SET/COAST switch for at least 10 seconds, then release it and wait at least 10 seconds.
- Press DISTANCE switch for at least 10 seconds, then release it and wait at least 10 seconds.
- 7. Press LDP switch for at least 10 seconds, then release it at wait at least 10 seconds.
- 8. Check DTC.

Is DTC detected?

YES >> Go to EC-1037, "Diagnosis Procedure".

>> INSPECTION END NO

Diagnosis Procedure

1. CHECK GROUND CONNECTION

- Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

>> Repair or replace ground connection.

2.CHECK ICC STEERING SWITCH CIRCUIT

Turn ignition switch ON.

EC-1037 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

N

INFOID:0000000003958956

< DTC/CIRCUIT DIAGNOSIS >

Check the voltage between ECM harness connector terminals under the following conditions.

	ECM			
Connector -	+	_	Condition	Voltage (V)
	Terminal	Terminal		
			MAIN switch: Pressed	Approx. 0
	102 (ICC steering switch signal)	111	LDP switch: Pressed	Approx. 1.0
			CANCEL switch: Pressed	Approx. 1.9
M160			DISTANCE switch: Pressed	Approx. 2.6
			SET/COAST switch: Pressed	Approx. 3.2
			RESUME/ACCELERATE switch: Pressed	Approx. 3.7
			All ICC steering switches: Released	Approx. 4.2

Is the inspection result normal?

YES >> GO TO 8. NO >> GO TO 3.

3.check icc steering switch ground circuit for open and short

- 1. Turn ignition switch OFF.
- Disconnect ECM harness connector.
- 3. Disconnect combination switch harness connector.
- 4. Check the continuity between combination switch and ECM harness connector.

Combinat	Combination switch		CM	Continuity
Connector	Terminal	Connector Terminal		Continuity
_	16	M160	111	Existed

5. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5. NO >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Combination switch (spiral cable)
- Harness for open and short between ECM and combination switch

>> Repair open circuit, short to ground or short to power in harness or connectors.

$5. \mathsf{CHECK}$ ICC STEERING SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between combination switch and ECM harness connector.

Combination switch		EC	CM	Continuity
Connector	Terminal	Connector Terminal		Continuity
_	13	M160	102	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- · Combination switch (spiral cable)
- Harness for open and short between ECM and combination switch

P1564 ICC STEERING SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

INFOID:0000000003958957

>> Repair open circuit, short to ground or short to power in harness or connectors.

7. CHECK ICC STEERING SWITCH

Refer to EC-1039, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 8.

NO >> Replace ICC steering switch.

8. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

1. CHECK ICC STEERING SWITCH

- Turn ignition switch OFF.
- 2. Disconnect combination switch (spiral cable) harness connector M303.
- Check resistance between combination switch harness connector terminals under the following conditions.

Combination switch		Condition	Resistance (Ω)	
Connector	Terminals	Condition	110313141100 (\$2)	
		MAIN switch: Pressed	Approx. 0	
		LDP switch: Pressed	Approx. 270	
		CANCEL switch: Pressed	Approx. 620	
M303	13 and 16	DISTANCE switch: Pressed	Approx. 1,100	
		SET/COAST switch: Pressed	Approx. 1,810	
	İ	RESUME/ACCELERATE switch: Pressed	Approx. 3,000	
		All ICC steering switches: Released	Approx. 5,420	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace ICC steering switch

EC

Α

D

Е

F

Н

K

L

M

Ν

0

Р

P1568 ICC FUNCTION

DTC Logic

DTC DETECTION LOGIC

NOTE:

- If DTC P1568 is displayed with DTC UXXXX, first perform the trouble diagnosis for DTC UXXXX.
- If DTC P1568 is displayed with DTC P0605, first perform the trouble diagnosis for DTC P0605. Refer to <u>EC-956</u>, "DTC Logic".
- If DTC P1568 is displayed with DTC P0607, first perform the trouble diagnosis for DTC P0607. Refer to <u>EC-958</u>, "DTC Logic".

DTC No.	Trouble Diagnosis Name	DTC Detecting Condition	Possible Cause
P1568	ICC function	ECM detects a difference between signals from ICC sensor integrated unit is out of specified range.	Harness or connectors (The CAN communication line is open or shorted.) ICC sensor integrated unit ECM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Step 2 may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

>> GO TO 2.

2.perform dtc confirmation procedure

- 1. Turn ignition switch ON.
- 2. Press MAIN switch on ICC steering switch.
- Drive the vehicle at more than 40 km/h (25 MPH).

CAUTION:

Always drive vehicle at a safe speed.

- 4. Press SET/COAST switch.
- 5. Check DTC.

Is DTC detected?

YES >> Go to EC-1040, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003958959

1. REPLACE ICC SENSOR INTEGRATED UNIT

- Replace ICC sensor integrated unit.
- Perform <u>CCS-13</u>, "<u>ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT (ICC SENSOR INTE-GRATED UNIT)</u>: Special Repair Requirement".
- 3. Check DTC of ICC sensor integrated unit. Refer to CCS-44, "Diagnosis Description".

>> INSPECTION END

Α

EC

D

Е

F

K

M

Ν

P1572 ASCD BRAKE SWITCH

Description

When the brake pedal is depressed, ASCD brake switch is turned OFF and stop lamp switch is turned ON. ECM detects the state of the brake pedal by those two types of input (ON/OFF signal).

Refer to EC-632, "System Description" for the ASCD function.

DTC Logic

DTC DETECTION LOGIC

NOTE:

- If DTC P1572 is displayed with DTC P0605, first perform the trouble diagnosis for DTC P0605. Refer to EC-956, "DTC Logic".
- This self-diagnosis has the one trip detection logic. When malfunction A is detected, DTC is not stored in ECM memory. And in that case, 1st trip DTC and 1st trip freeze frame data are displayed.
 1st trip DTC is erased when ignition switch is turned OFF. And even when malfunction A is detected in two consecutive trips, DTC is not stored in ECM memory.

DTC No.	Trouble diagnosis name	DTC detecting condition		Possible cause	
		A)	When the vehicle speed is above 30 km/h (19 MPH), ON signals from the stop lamp switch and the ASCD brake switch are sent to the ECM at the same time.	Harness or connectors (The stop lamp switch circuit is shorted.) Harness or connectors (The ASCD brake switch circuit is short-	
P1572	ASCD brake switch	В)	ASCD brake switch signal is not sent to ECM for extremely long time while the vehicle is being driven.	ed.) Stop lamp switch ASCD brake switch Incorrect stop lamp switch installation Incorrect ASCD brake switch installation ECM	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

NOTE:

The procedure for malfunction B is not described. It takes an extremely long time to complete the procedure for malfunction B. By performing the procedure for malfunction A, the condition that causes malfunction B can be detected.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION A

- 1. Start engine (VDC switch OFF).
- 2. Press MAIN switch and check that CRUISE indicator is displayed in combination meter.
- Drive the vehicle for at least 5 consecutive seconds under the following conditions.

Always drive vehicle at a safe speed.

NOTE:

This procedure may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

Selector lever	Suitable position
Vehicle speed	More than 30 km/h (19 mph)

4. Check 1st trip DTC.

P1572 ASCD BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Is 1st trip DTC detected?

>> Go to EC-1042, "Diagnosis Procedure".

NO >> GO TO 3.

3.perform dtc confirmation procedure

Drive the vehicle for at least 5 consecutive seconds under the following conditions.

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

This procedure may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

Vehicle speed	More than 30 km/h (19 mph)
Selector lever	Suitable position
Driving location	Depress the brake pedal for more than 5 seconds so as not to come off from the above-mentioned vehicle speed.

2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-1042, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003958962

1. CHECK OVERALL FUNCTION-I

(II) With CONSULT-III

- Turn ignition switch ON.
- Select "BRAKE SW1" in "DATA MONITOR" mode with CONSULT-III.
- Check "BRAKE SW1" indication under the following conditions.

Monitor item	C	ondition	Indication
BRAKE SW1	Brake pedal	Slightly depressed	OFF
(ASCD brake switch)	втаке редаі	Fully released	ON

Without CONSULT-III

- Turn ignition switch ON.
- Check the voltage between ECM harness connector terminals as per the following.

	ECM				
Connector	+	_	Condition		Voltage (V)
Connector	Terminal Terminal				
M160	117	128	Brake pedal	Slightly depressed	Approx. 0
WITOU	(ASCD brake switch signal)	120	brake pedar	Fully released	Battery voltage

Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 3.

2. CHECK OVERALL FUNCTION-II

(P) With CONSULT-III

Select "BRAKE SW2" and check indication under the following conditions.

Monitor item	Condition		Indication
BRAKE SW2	Brake pedal	Slightly depressed	ON
(Stop lamp switch)	brake pedar	Fully released	OFF

P1572 ASCD BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Without CONSULT-III

Check the voltage between ECM harness connector terminals under the following conditions.

	ECM					
Connector	+	_	Condition		Voltage (V)	
Comecion	Terminal	Terminal				
M160	110	128	Brake pedal	Slightly depressed	Battery voltage	
	(Stop lamp switch signal)	120	brake pedar	Fully released	Approx. 0	

EC

Α

Is the inspection result normal?

YES >> GO TO 13. NO >> GO TO 8. D

 ${f 3.}$ CHECK ASCD BRAKE SWITCH POWER SUPPLY CIRCUIT

F

- 1. Turn ignition switch OFF.
- Disconnect ASCD brake switch harness connector.
- Turn ignition switch ON.
- 4. Check the voltage between ASCD brake switch harness connector and ground.

ASCD bra	ke switch	Ground	Voltage	
Connector Terminal		Giodila	voltage	
E109	1	Ground	Battery voltage	

G

F

Is the inspection result normal?

YES >> GO TO 5. NO >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

• Fuse block (J/B) connector E103

• 10 A fuse (No. 3)

- Harness for open or short between ASCD brake switch and fuse
 - >> Repair open circuit or short to ground in harness or connectors.

Κ

${f 5.}$ CHECK ASCD BRAKE SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check the continuity between ASCD brake switch harness connector and ECM harness connector.

ASCD bra	ke switch	EC	Continuity	
Connector Terminal		Connector	Terminal	Continuity
E109	2	M160	117	Existed

N

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 6. 0

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E106, M6
- Harness for open or short between ECM and ASCD brake switch

>> Repair open circuit, short to ground or short to power in harness or connectors.

7. CHECK ASCD BRAKE SWITCH

Revision: 2009 March **EC-1043** 2009 FX35/FX50

P1572 ASCD BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Refer to EC-1045, "Component Inspection (ASCD Brake Switch)"

Is the inspection result normal?

YES >> GO TO 13.

NO >> Replace ASCD brake switch.

8.CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect stop lamp switch harness connector.
- 3. Check the voltage between stop lamp switch harness connector and ground.

Stop lam	p switch	Ground	Voltage	
Connector	Terminal	Giodila		
E110	3	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 10.

NO >> GO TO 9.

9. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E103
- 10 A fuse (No. 7)
- · Harness for open or short between stop lamp switch and battery

>> Repair open circuit, short to ground or short to power in harness or connectors.

10.CHECK STOP LAMP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Disconnect ECM harness connector.
- 2. Check the continuity between stop lamp switch harness connector and ECM harness connector.

Stop lam	p switch	EC	Continuity	
Connector Terminal		Connector	Terminal	Continuity
E110	4	M160	110	Existed

3. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 12.

NO >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connectors E103, M2
- · Harness for open or short between ECM and stop lamp switch

>> Repair open circuit, short to ground or short to power in harness or connectors.

12. CHECK STOP LAMP SWITCH

Refer to EC-1045, "Component Inspection (Stop Lamp Switch)".

Is the inspection result normal?

YES >> GO TO 13.

NO >> Replace stop lamp switch.

13. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

P1572 ASCD BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Component Inspection (ASCD Brake Switch)

INFOID:0000000003958963

1.CHECK ASCD BRAKE SWITCH-I

- Turn ignition switch OFF.
- 2. Disconnect ASCD brake switch harness connector.
- Check the continuity between ASCD brake switch terminals under the following conditions.

Terminals	Condition		Continuity
1 and 2	Brake pedal	Fully released	Existed
i anu z	brake pedar	Slightly depressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.CHECK ASCD BRAKE SWITCH-II

- Adjust ASCD brake switch installation. Refer to BR-7, "Inspection and Adjustment".
- Check the continuity between ASCD brake switch terminals under the following conditions.

Terminals	Condition		Continuity
1 and 2	Brake pedal	Fully released	Existed
1 410 2	brake pedar	Slightly depressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace ASCD brake switch.

Component Inspection (Stop Lamp Switch)

INFOID:0000000003958964

1. CHECK STOP LAMP SWITCH-I

- Turn ignition switch OFF.
- Disconnect stop lamp switch harness connector. 2.
- Check the continuity between stop lamp switch terminals under the following conditions.

Terminals	Condition		Continuity
3 and 4	Brake pedal	Fully released	Not existed
o and 4	Drake pedar	Slightly depressed	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.CHECK STOP LAMP SWITCH-II

- Adjust stop lamp switch installation. Refer to BR-7, "Inspection and Adjustment".
- Check the continuity between stop lamp switch terminals under the following conditions.

Terminals	Condition		Continuity
3 and 4	Brake pedal	Fully released	Not existed
<u> </u>	Бтаке ресса	Slightly depressed	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace stop lamp switch.

EC-1045 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

F

Н

K

Ν

P1572 ICC BRAKE SWITCH

Description

When the brake pedal is depressed, ICC brake switch is turned OFF and stop lamp switch is turned ON. ECM detects the state of the brake pedal by those two types of input (ON/OFF signal). Refer to CCS-24, "System Description" for the ICC function.

DTC Logic

DTC DETECTION LOGIC

NOTE:

- If DTC P1572 is displayed with DTC P0605, first perform the trouble diagnosis for DTC P0605. Refer to EC-956, "DTC Logic".
- This self-diagnosis has the one trip detection logic. When malfunction A is detected, DTC is not stored in ECM memory. And in that case, 1st trip DTC and 1st trip freeze frame data are displayed.
 1st trip DTC is erased when ignition switch is turned OFF. And even when malfunction A is detected in two consecutive trips, DTC is not stored in ECM memory.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
		A) ON signals from the stop lamp so and the ICC brake switch are see ECM at the same time.	nt to (The stop lamp switch circuit is shorted.) • Harness or connectors
P1572	ICC brake switch	ICC brake switch signal is not se B) ECM for extremely long time whi vehicle is being driven	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

NOTE:

The procedure for malfunction B is not described. It takes an extremely long time to complete the procedure for malfunction B. By performing the procedure for malfunction A, the condition that causes malfunction B can be detected.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine (VDC switch OFF).
- 2. Press MAIN switch and check that CRUISE indicator is displayed in combination meter.
- Drive the vehicle for at least 5 consecutive seconds under the following conditions. CAUTION:

Always drive vehicle at a safe speed.

NOTÉ:

This procedure may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

Vehicle speed	More than 30 km/h (19 mph)
Selector lever	Suitable position

Check 1st trip DTC.

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Is 1st trip DTC detected?

YES >> Go to EC-1047, "Diagnosis Procedure".

NO >> GO TO 3.

3. PERFORM DTC CONFIRMATION PROCEDURE

Drive the vehicle for at least 5 consecutive seconds under the following conditions.

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

This procedure may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

More than 30 km/h (19 mph) Vehicle speed Selector lever Suitable position Depress the brake pedal for more than 5 seconds so as **Driving location** not to come off from the above-mentioned vehicle speed.

Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-1047, "Diagnosis Procedure".

NO >> INSPECTION END

INFOID:0000000003958967

Diagnosis Procedure

${f 1}$.CHECK DTC WITH ICC SENSOR INTEGRATED UNIT

Refer to CCS-44, "Diagnosis Description".

Are any DTCs detected?

YES >> Perform the Diagnosis Procedure corresponding to the detected DTC.

NO >> GO TO 2.

2.CHECK OVERALL FUNCTION-I

(P) With CONSULT-III

- Turn ignition switch ON.
- Select "BRAKE SW1" in "DATA MONITOR" mode with CONSULT-III.
- Check "BRAKE SW1" indication under the following conditions.

Monitor item	Condition		Indication
BRAKE SW1	Brake pedal	Slightly depressed	OFF
(ICC brake switch)	Diake pedai	Fully released	ON

Without CONSULT-III

- Turn ignition switch ON.
- Check the voltage between ECM harness connector terminals under the following conditions.

ECM						
Connector +		_	Condition		Voltage (V)	
Connector	Terminal	Terminal				
M160	117	128	Brake pedal Slightly depressed		Approx. 0	
WITOU	(ICC brake switch signal)	128	brake pedar	Fully released	Battery voltage	

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 4.

$oldsymbol{3}.$ CHECK OVERALL FUNCTION-II

(P) With CONSULT-III

Revision: 2009 March

EC-1047

EC

Α

D

Е

F

Ν

Р

2009 FX35/FX50

< DTC/CIRCUIT DIAGNOSIS >

Select "BRAKE SW2" and check indication under the following conditions.

Monitor item	C	Indication	
BRAKE SW2	Brako podal	Slightly depressed	ON
(Stop lamp switch)	Brake pedal	Fully released	OFF

Without CONSULT-III

Check the voltage between ECM harness connector terminals under the following conditions.

ECM					
Connector +		_	Condition		Voltage (V)
Connector	Terminal	Terminal			
M160	110	128	Brake pedal	Slightly depressed	Battery voltage
WITOU	(Stop lamp switch signal)		brake pedar	Fully released	Approx. 0

Is the inspection result normal?

YES >> GO TO 16.

NO >> GO TO 11.

4. CHECK ICC BRAKE SWITCH POWER SUPPLY CIRCUIT-I

- 1. Turn ignition switch OFF.
- 2. Disconnect ICC brake switch harness connector.
- 3. Turn ignition switch ON.
- 4. Check the voltage between ICC brake switch harness connector and ground.

ICC brak	e switch	Ground	Voltage
Connector	Connector Terminal		voltage
E114	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 8.

NO >> GO TO 5.

5. CHECK ICC BRAKE SWITCH POWER SUPPLY CIRCUIT-II

- 1. Turn ignition switch OFF.
- 2. Disconnect ICC brake hold relay.
- Turn ignition switch ON.
- 4. Check the voltage between ICC brake hold relay harness connector and ground.

ICC brake	hold relay	Ground	Voltage
Connector Terminal		Ground	vollage
E91	3	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E103
- 10 A fuse (No. 3)
- Harness for open or short between ICC brake hold relay and fuse

>> Repair open circuit or short to ground in harness or connectors.

7.CHECK ICC BRAKE SWITCH POWER SUPPLY CIRCUIT-III

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

EC

Е

K

M

N

1. Turn ignition switch OFF.

2. Check the continuity between ICC brake switch harness connector and ICC brake hold relay harness connector.

ICC brak	e switch	ICC brake hold relay Connector Terminal		Continuity	
Connector	Terminal				
E114	1	E91	4	Existed	

3. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 16.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

8.CHECK ICC BRAKE SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- Disconnect ECM harness connector.
- 3. Check the continuity between ICC brake switch harness connector and ECM harness connector.

ICC brak	ke switch ECM Continuity		ECM		
Connector	Terminal	Connector Terminal		Continuity	
E114	2	M160	117	Existed	

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 10.

NO >> GO TO 9.

$\mathbf{9}.$ DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E106, M6
- Harness for open or short between ICC brake switch and ECM

>> Repair open circuit, short to ground or short to power in harness or connectors.

10. CHECK ICC BRAKE SWITCH

Refer to EC-1050, "Component Inspection (ICC Brake Switch)".

Is the inspection result normal?

YES >> GO TO 16.

NO >> Replace ICC brake switch.

11. CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT

- Turn ignition switch OFF.
- 2. Disconnect stop lamp switch harness connector.
- 3. Disconnect ICC brake hold relay.
- Check the voltage between stop lamp switch harness connector and ground.

Stop lamp switch		Ground	Voltage
Connector	Connector Terminal		voltage
E110	3	Ground	Battery voltage

5. Check the voltage between ICC brake hold relay harness connector and ground.

ICC brake hold relay		Ground	Voltage
Connector	Connector Terminal		voltage
E91	7	Ground	Battery voltage

Is the inspection result normal?

< DTC/CIRCUIT DIAGNOSIS >

>> GO TO 13. >> GO TO 12.

12. DETECT MALFUNCTIONING PART

Check the following.

YES

NO

- Fuse block (J/B) connector E103
- 10 A fuse (No. 7)
- Harness for open or short between battery and stop lamp switch
- Harness for open or short between battery and ICC brake hold relay

>> Repair open circuit or short to ground in harness or connectors.

13.check stop lamp switch input signal circuit for open and short

- Disconnect ECM harness connector.
- Check the continuity between stop lamp switch harness connector and ECM harness connector.

Stop lam	Stop lamp switch		ECM		
Connector	Terminal	Connector Terminal		Continuity	
E110	4	M160	110	Existed	

Check the continuity between ICC brake hold relay harness connector and ECM harness connector.

ICC brake	ICC brake hold relay		ECM	
Connector	Terminal	Connector Terminal		Continuity
E91	6	M160	110	Existed

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 15. NO >> GO TO 14.

14. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E103, M2
- · Harness for open or short between ECM and stop lamp switch
- Harness for open or short between ECM and ICC brake hold relay

>> Repair open circuit, short to ground or short to power in harness or connectors.

15. CHECK STOP LAMP SWITCH

Refer to EC-1051, "Component Inspection (Stop Lamp Switch)".

Is the inspection result normal?

YES >> GO TO 16.

NO >> Replace stop lamp switch.

16. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection (ICC Brake Switch)

INFOID:0000000003958968

1.CHECK ICC BRAKE SWITCH-I

- Turn ignition switch OFF.
- Disconnect ICC brake switch harness connector.
- Check the continuity between ICC brake switch terminals under the following conditions.

EC-1050 Revision: 2009 March 2009 FX35/FX50

[VK50VE]

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Terminals	(Condition	Continuity			
4 10	D. d lal	Fully released	Existed			
1 and 2	Brake pedal	Slightly depressed	Not existed			
the insp	ection result	normal?	<u>'</u>			
_	> INSPECTI	ION END				
_	> GO TO 2.					
. .CHECK	CICC BRAK	E SWITCH-II				
				7, "Inspection and Adjustment".		
. Check	the continu	ity between ICC b	rake switch to	rminals under the following conditions.		
Terminals		Condition	Continuity			
Terminais	•		Continuity			
1 and 2	Brake pedal	Fully released Slightly depressed				
		5 7 .	Not existed			
the insn	ection result	normal?				
-						
YES >	> INSPECTI	ION END				
YES >	> INSPECTI > Replace IO	ION END CC brake switch.	omo o Conital	,		
YES >	> INSPECTI > Replace IO	ION END	amp Switch)	INFOID:0000000003958969	,
YES > NO >	> INSPECTI > Replace IO nent Inspe	ION END CC brake switch.	amp Switch)	INFOID:0000000003958969	
YES > NO > Compon	> INSPECTI > Replace IO nent Inspe C STOP LAM	ION END CC brake switch. ection (Stop La IP SWITCH-I	amp Switch)	INFOID:0000000003958969	
YES > NO > Compon .CHECk	> INSPECTI > Replace IO nent Inspe C STOP LAN gnition switc	ION END CC brake switch. ection (Stop La IP SWITCH-I)	INFOID:000000003958969	
YES > NO > COMPON CHECK Turn iç Discor	> INSPECTI > Replace IO nent Inspe < STOP LAN gnition switc nnect stop la	ION END CC brake switch. ection (Stop La IP SWITCH-I h OFF. amp switch harnes	ss connector.) rminals under the following conditions.	INFOID:0000000003958969	
YES > NO > COMPON CHECK Turn iq Discor Check	> INSPECTI > Replace IO nent Inspe < STOP LAM gnition switc nnect stop lake the continu	ION END CC brake switch. ection (Stop La IP SWITCH-I h OFF. amp switch harnes ity between stop I	ss connector. amp switch te	,	INFOID:000000003958969	
YES > NO > Compon .CHECk . Turn iç . Discor	> INSPECTI > Replace IO nent Inspe < STOP LAM gnition switc nnect stop lake the continu	ION END CC brake switch. ection (Stop La IP SWITCH-I h OFF. amp switch harnes	ss connector.	,	INFOID-0000000003958969	
YES > NO > COMPONIANT OF THE CHECK Turn iq Object Terminals	> INSPECTION NO STOP LAM STOP LAM Gnition switch nect stop lack the continual contin	ION END CC brake switch. ection (Stop La IP SWITCH-I h OFF. amp switch harnes ity between stop I	ss connector. amp switch te	,	INFOID:000000003958969	
YES > NO > Compon CHECK Turn iq Discor Check	> INSPECTI > Replace IO nent Inspe < STOP LAM gnition switc nnect stop lake the continu	ION END CC brake switch. ection (Stop La IP SWITCH-I h OFF. amp switch harnes ity between stop I	ss connector. amp switch te	,	INFOID:000000003958969	

2. CHECK STOP LAMP SWITCH-II

- Adjust stop lamp switch installation. Refer to <u>BR-7</u>, "<u>Inspection and Adjustment</u>".
 Check the continuity between stop lamp switch terminals under the following conditions.

Terminals	Condition		Continuity
3 and 4	Brake pedal	Fully released	Not existed
	Бтакс ресса	Slightly depressed	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace stop lamp switch.

EC-1051 Revision: 2009 March 2009 FX35/FX50

M

Ν

P1574 ASCD VEHICLE SPEED SENSOR

Description INFOID:000000003958971

The ECM receives two vehicle speed signals by the CAN communication line. One is sent from "unified meter and A/C amp.", and the other is from TCM (Transmission control module). The ECM uses these signals for ASCD control. Refer to EC-632, "System Description" for ASCD functions.

DTC Logic

DTC DETECTION LOGIC

NOTE:

- If DTC P1574 is displayed with DTC UXXXX, first perform the trouble diagnosis for DTC UXXXX.
- If DTC P1574 is displayed with DTC P0500, first perform the trouble diagnosis for DTC P0500. Refer to EC-942, "DTC Logic".
- If DTC P1574 is displayed with DTC P0605, first perform the trouble diagnosis for DTC P0605. Refer to EC-956, "DTC Logic".
- If DTC P1574 is displayed with DTC P0607, first perform the trouble diagnosis for DTC P0607. Refer to EC-958, "DTC Logic".

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1574	ASCD vehicle speed sensor	ECM detects a difference between two vehicle speed signals is out of the specified range.	Harness or connectors (The CAN communication line is open or shorted.) Unified meter and A/C amp. ABS actuator and electric unit (control unit) Wheel sensor TCM ECM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine (VDC switch OFF).
- 2. Drive the vehicle at more than 40 km/h (25 MPH).

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

This procedure may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

Check DTC.

Is DTC detected?

YES >> Go to EC-1052, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003958973

1. CHECK DTC WITH TCM

Check DTC with TCM. Refer to TM-263, "Diagnosis Description".

Is the inspection result normal?

P1574 ASCD VEHICLE SPEED SENSOR	D///F0\/F1	
< DTC/CIRCUIT DIAGNOSIS >	[VK50VE]	
YES >> GO TO 2. NO >> Perform Diagnosis Procedure corresponding to the DTC indicated.		А
2.CHECK DTC WITH "ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)"		/ (
Refer to BRC-44, "CONSULT-III Function".		
Is the inspection result normal?		EC
YES >> GO TO 3.	·	
NO >> Perform Diagnosis Procedure corresponding to the DTC indicated.		С
3.CHECK DTC WITH "UNIFIED METER AND A/C AMP."		
Refer to MWI-45, "CONSULT-III Function (METER/M&A)".		D
>> INSPECTION END		
>> INSPECTION END		
		Е
		F
		G
		G
		Н
		J
		IZ.
		K
		L
		M
		Ν
		1 4
		0

EC-1053 Revision: 2009 March 2009 FX35/FX50

P1574 ICC VEHICLE SPEED SENSOR

Description INFOID:000000003958974

The ECM receives two vehicle speed signals by the CAN communication line. One is sent from "unified meter and A/C amp.", and the other is from TCM (Transmission control module). The ECM uses these signals for ICC control. Refer to CCS-24, "System Description" for ICC functions.

DTC Logic

DTC DETECTION LOGIC

NOTE:

- If DTC P1574 is displayed with DTC UXXXX, first perform the trouble diagnosis for DTC UXXXX.
- If DTC P1574 is displayed with DTC P0500, first perform the trouble diagnosis for DTC P0500. Refer to EC-942, "DTC Logic".
- If DTC P1574 is displayed with DTC P0605, first perform the trouble diagnosis for DTC P0605. Refer to EC-956, "DTC Logic".
- If DTC P1574 is displayed with DTC P0607, first perform the trouble diagnosis for DTC P0607. Refer to EC-958, "DTC Logic".

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1574	ICC vehicle speed sensor	ECM detects a difference between two vehicle speed signals is out of the specified range.	Harness or connectors (The CAN communication line is open or shorted.) Unified meter and A/C amp. ABS actuator and electric unit (control unit) Wheel sensor TCM ECM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine (VDC switch OFF).
- 2. Drive the vehicle at more than 40 km/h (25 MPH).

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

This procedure may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

Check DTC.

Is DTC detected?

YES >> Go to EC-1054, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1.CHECK DTC WITH TCM

Check DTC with TCM. Refer to TM-263, "Diagnosis Description".

Is the inspection result normal?

INFOID:0000000003958976

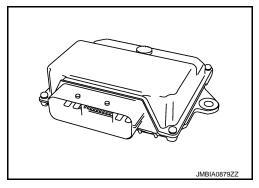
P1574 ICC VEHICLE SPEED SENSOR		
< DTC/CIRCUIT DIAGNOSIS >	[VK50VE]	
YES >> GO TO 2. NO >> Perform Diagnosis Procedure corresponding to the DTC indicated.		А
2.CHECK DTC WITH "ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)"		
Refer to BRC-44, "CONSULT-III Function". Is the inspection result normal?		EC
YES >> GO TO 3.		
NO >> Perform Diagnosis Procedure corresponding to the DTC indicated. 3.CHECK DTC WITH "UNIFIED METER AND A/C AMP."		С
Check combination meter function.		
Refer to MWI-45, "CONSULT-III Function (METER/M&A)".		D
>> INSPECTION END		Е
		_
		F
		G
		Н
		J
		K
		L
		M
		IVI
		Ν
		. 4
		0
		Р

EC-1055 Revision: 2009 March 2009 FX35/FX50

P1606 VVEL CONTROL MODULE

Description INFOID:000000003959745

The VVEL control module consists of a microcomputer and connectors for signal input and output and for power supply. The VVEL control module controls VVEL system.



DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1606	VVEL control module	 VVEL control module calculation function is malfunctioning. VVEL EEP-ROM system is malfunctioning. 	VVEL control module

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10 V at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Turn ignition switch ON and wait at least 1 second.
- 2. Check DTC.

Is DTC detected?

YES >> Go to EC-1056, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003959747

1. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Turn ignition switch ON.
- Erase DTC.
- Perform DTC Confirmation Procedure. See <u>EC-1056</u>, "DTC Logic".

Is the DTC P1606 displayed again?

YES >> GO TO 2.

NO >> INSPECTION END

2.REPLACE VVEL CONTROL MODULE

1. Replace VVEL control module.

P1606 VVEL CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

2. Perform <u>EC-580</u>, "ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT (VVEL CONTROL MODULE): Special Repair Requirement".

>> INSPECTION END

EC

Α

С

D

Е

F

G

Н

J

K

L

M

Ν

0

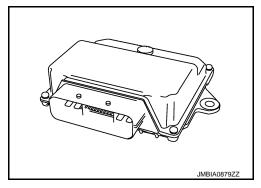
INFOID:0000000003959750

2009 FX35/FX50

P1607 VVEL CONTROL MODULE

Description INFOID:0000000004032261

The VVEL control module consists of a microcomputer and connectors for signal input and output and for power supply. The VVEL control module controls VVEL system.



DTC Logic INFOID:0000000003959749

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1607	VVEL control module circuit	The internal circuit of the VVEL control module is malfunctioning.	VVEL control module

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10 V at idle.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- Start engine and let it idle for at least 1 second.
- 2. Check DTC.

Is DTC detected?

>> Go to EC-1058, "Diagnosis Procedure". YES

>> INSPECTION END NO

Diagnosis Procedure

1. PERFORM DTC CONFIRMATION PROCEDURE

Turn ignition switch ON.

- Erase DTC.
- Perform DTC Confirmation Procedure. See EC-1058, "DTC Logic".

Is the DTC P1607 displayed again?

YES >> GO TO 2.

Revision: 2009 March

NO >> INSPECTION END

2.REPLACE VVEL CONTROL MODULE

Replace VVEL control module.

EC-1058

P1607 VVEL CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

2. Go to EC-580, "ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT (VVEL CONTROL MOD-ULE): Special Repair Requirement".

>> INSPECTION END

EC

Α

С

D

Е

F

G

Н

J

K

L

M

Ν

0

P1608 VVEL SENSOR POWER SUPPLY

DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1608	VVEL sensor power supply circuit	VVEL control module detects a voltage of power source for sensor is excessively low or high.	Harness or connectors (VVEL control shaft position sensor power supply circuit is open or shorted.) VVEL control shaft position sensor VVEL control module

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10 V at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Turn ignition switch ON and wait at least 1 second.
- 2. Check DTC.

Is DTC detected?

YES >> Go to EC-1060, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003959752

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK VVEL CONTROL SHAFT POSITION SENSOR POWER SUPPLY CIRCUIT-I

- 1. Disconnect VVEL control shaft position sensor harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between VVEL control shaft position sensor harness connector and ground.

VVEL	control shaft position	Ground	Voltage	
Bank	Bank Connector Terminal			Giodila
1	1 F72			
1	172	6	Ground	Approx. 5V
2	F70	3		
	170	6		

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 3.

P1608 VVEL SENSOR POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

 $\overline{3.}$ CHECK VVEL CONTROL SHAFT POSITION SENSOR POWER SUPPLY CIRCUIT-II

- 1. Turn ignition switch OFF.
- Disconnect VVEL control module harness connector.
- Check the continuity between VVEL control shaft position sensor harness connector and VVEL control module harness connector.

Е	C	;

[VK50VE]

VVEL control shaft position sensor			VVEL control module		Continuity	
Bank	Connector	Terminal	Connector	Terminal	Continuity	
1	F72	3		7		
1	172	6	E15	20	Existed	
2	F70	F70	3	LIJ	9	LXISTEG
		6			22	

Also check harness for short to ground and power.

Is the inspection result normal?

>> GO TO 5. YES

NO >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F10, E10
- Harness for open or short between VVEL control shaft position sensor and VVEL control module

>> Repair open circuit, short to ground or short to power in harness or connectors.

5. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace.

6. REPLACE VVEL CONTROL MODULE

- Replace VVEL control module.
- Perform EC-580, "ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT (VVEL CONTROL MODULE): Special Repair Requirement".

>> INSPECTION END

.CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace.

8.REPLACE VVEL ACTUATOR SUB ASSEMBLY

- Replace VVEL actuator sub assembly.
- Perform EC-1061, "Special Repair Requirement".

>> NSPECTION END

Special Repair Requirement

 ${f 1}$.PERFORM VVEL CONTROL SHAFT POSITION SENSOR ADJUSTMENT

Refer to EC-584, "VVEL CONTROL SHAFT POSITION SENSOR ADJUSTMENT: Special Repair Requirement".

EC-1061 Revision: 2009 March 2009 FX35/FX50

Е

Н

N

Р

INFOID:0000000003959753

P1608 VVEL SENSOR POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

>> GO TO 2.

$2.\mathsf{PERFORM}$ IDLE AIR VOLUME LEARNING

Refer to EC-583, "IDLE AIR VOLUME LEARNING: Special Repair Requirement".

>> END

P1715 INPUT SPEED SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

P1715 INPUT SPEED SENSOR

Description INFOID:000000003958977

ECM receives input speed sensor signal from TCM by the CAN communication line. ECM uses this signal for engine control.

EC

D

Н

Α

DTC Logic

INFOID:0000000003958978

DTC DETECTION LOGIC

NOTE:

- If DTC P1715 is displayed with DTC UXXXX, first perform the trouble diagnosis for DTC UXXXX.
- If DTC P1715 is displayed with DTC P0335, first perform the trouble diagnosis for DTC P0335. Refer to <u>EC-867</u>, "<u>DTC Logic"</u>.
- If DTC P1715 is displayed with DTC P0340, first perform the trouble diagnosis for DTC P0340. Refer to <u>EC-871</u>, "<u>DTC Logic"</u>.
- If DTC P1715 is displayed with DTC P0605, first perform the trouble diagnosis for DTC P0605. Refer to EC-956, "DTC Logic".
- If DTC P1715 is displayed with DTC P0607, first perform the trouble diagnosis for DTC P0607. Refer to <u>EC-958</u>, "DTC Logic".

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1715	Input speed sensor (TCM output)	Input speed sensor signal is different from the theoretical value calculated by ECM from output speed sensor signal and engine rpm signal.	Harness or connectors (The CAN communication line is open or shorted) (Input speed sensor circuit is open or shorted) TCM

Diagnosis Procedure

INFOID:0000000003958979

1. CHECK DTC WITH TCM

Check DTC with TCM. Refer to TM-263, "Diagnosis Description".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Perform Diagnosis Procedure corresponding to DTC indicated.

2.REPLACE TCM

Replace TCM.

>> INSPECTION END

M

K

0

Ν

P1805 BRAKE SWITCH

Description

Brake switch signal is applied to the ECM through the stop lamp switch when the brake pedal is depressed. This signal is used mainly to decrease the engine speed when the vehicle is being driven.

DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	
P1805	Brake switch	A brake switch signal is not sent to ECM for extremely long time while the vehicle is being driven.	Harness or connectors (Stop lamp switch circuit is open or shorted.) Stop lamp switch	

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

- Turn ignition switch ON.
- 2. Fully depress the brake pedal for at least 5 seconds.
- Erase the DTC.
- 4. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-1064, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003958982

1. CHECK STOP LAMP SWITCH CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Check for stop lamp illumination under the following conditions.

	Condition	Stop lamp
Brake pedal	Fully released	Not illuminated
brake pedar	Slightly depressed	Illuminated

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 2.

2.CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT

- 1. Disconnect stop lamp switch harness connector.
- 2. Check the voltage between stop lamp switch harness connector and ground.

Stop lam	p switch	Ground	Voltage
Connector Terminal		Ground	voltage
E110	3	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

${f 3.}$ DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E103
- 10 A fuse (No. 7)
- · Harness for open or short between stop lamp switch and battery

P1805 BRAKE SWITCH

[VK50VE]

>> Repair open circuit, short to ground or short to power in harness or connectors.

f 4.CHECK STOP LAMP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Disconnect stop lamp switch harness connector.
- Disconnect ECM harness connector. 2.
- Check the continuity between stop lamp switch harness connector and ECM harness connector.

Stop lamp switch		ECM		Continuity
Connector	Terminal	Connector Terminal		Continuity
E110	4	M160	110	Existed

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 5.

${f 5.}$ DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E103, M2
- Harness for open or short between ECM and stop lamp switch

>> Repair open circuit, short to ground or short to power in harness or connectors.

O.CHECK STOP LAMP SWITCH

Refer to EC-1065, "Component Inspection (Stop Lamp Switch)".

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace stop lamp switch.

7.CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection (Stop Lamp Switch)

1. CHECK STOP LAMP SWITCH-I

- Turn ignition switch OFF.
- Disconnect stop lamp switch harness connector.
- Check the continuity between stop lamp switch terminals under the following conditions.

Terminals	C	Continuity	
3 and 4	Brake pedal	Fully released	Not existed
	Brake pedar	Slightly depressed	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.CHECK STOP LAMP SWITCH-II

- Adjust stop lamp switch installation. Refer to BR-7, "Inspection and Adjustment".
- Check the continuity between stop lamp switch terminals under the following conditions.

EC

Α

Е

D

Н

K

INFOID:0000000004032269

N

P1805 BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Terminals	Condition		Condition		Continuity
3 and 4	Brake pedal	Fully released	Not existed		
3 and 4	brake pedar	Slightly depressed	Existed		

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace stop lamp switch.

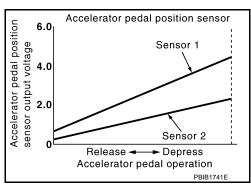
P2122, P2123 APP SENSOR

Description INFOID:0000000003958984

The accelerator pedal position sensor is installed on the accelerator pedal assembly. The sensor detects the accelerator position and sends a signal to the ECM.

Accelerator pedal position sensor has two sensors. These sensors are a kind of potentiometer which transform the accelerator pedal position into output voltage, and emit the voltage signals to the ECM. The ECM judges the current opening angle of the accelerator pedal from these signals and controls the throttle control motor based on these signals.

Idle position of the accelerator pedal is determined by the ECM receiving the signal from the accelerator pedal position sensor. The ECM uses this signal for engine operations such as fuel cut.



DTC Logic INFOID:0000000003958985

DTC DETECTION LOGIC

If DTC P2122 or P2123 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. Refer to <u>EC-959</u>, "<u>DTC Logic</u>".

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P2122	Accelerator pedal position sensor 1 circuit low input	An excessively low voltage from the APP sensor 1 is sent to ECM.	Harness or connectors (APP sensor 1 circuit is open or shorted.)
P2123	Accelerator pedal position sensor 1 circuit high input	An excessively high voltage from the APP sensor 1 is sent to ECM.	Accelerator pedal position sensor (APP sensor 1)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 8 V at idle.

>> GO TO 2.

2.perform dtc confirmation procedure

- Start engine and let it idle for 1 second.
- Check DTC. 2.

Is DTC detected?

YES >> Go to EC-1067, "Diagnosis Procedure".

>> INSPECTION END NO

Diagnosis Procedure

1. CHECK GROUND CONNECTION

- Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

EC-1067 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

Е

Н

N

INFOID:0000000003958986

< DTC/CIRCUIT DIAGNOSIS >

2.check accelerator pedal position sensor 1 power supply circuit

- 1. Disconnect accelerator pedal position (APP) sensor harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between APP sensor harness connector and ground.

APP sensor		Ground	Voltage (V)	
Connector	nector Terminal			
E112 (Without ICC)	5	Ground	Approx. 5	
E116 (With ICC)	5	Ground	Αφρίολ. σ	

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M6, E106
- Harness for open or short between ECM and APP sensor

>> Repair open circuit, short to ground or short to power in harness or connectors.

4. CHECK APP SENSOR 1 GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check the continuity between APP sensor harness connector and ECM harness connector.

APP ser	APP sensor		ECM		
Connector	Terminal	Connector Terminal		Continuity	
E112 (Without ICC)	4	M160	119	Existed	
E116 (With ICC)	1	101100	119	LAISIGU	

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M6, E106
- · Harness for open or short between ECM and APP sensor

>> Repair open circuit, short to ground or short to power in harness or connectors.

O.CHECK APP SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between APP sensor harness connector and ECM harness connector.

APP ser	nsor	ECM		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E112 (Without ICC)	3	M160	104	Existed
E116 (With ICC)	4	IVITOO	104	LAISIEU
2 Also shoo	k harnaaa	for abort t	o around	and abort t

EC

Α

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 8. NO >> GO TO 7.

D

7.DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M6, E106
- Harness for open or short between ECM and APP sensor

>> Repair open circuit, short to ground or short to power in harness or connectors.

8. CHECK APP SENSOR

Refer to EC-1069, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 10. NO >> GO TO 9. Н

Ν

Р

F

9. REPLACE ACCELERATOR PEDAL ASSEMBLY

- 1. Replace accelerator pedal assembly.
- 2. Perform EC-1070, "Special Repair Requirement".

>> INSPECTION END

10. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

4

INFOID:0000000003958987

1. CHECK ACCELERATOR PEDAL POSITION SENSOR

- Turn ignition switch OFF.
- Reconnect all harness connectors disconnected.
- 3. Turn ignition switch ON.
- 4. Check the voltage ECM harness connector terminals under the following conditions.

	ECM				
Connector +		_	Condition		Voltage (V)
Connector	Terminal	Terminal			
	104 (APP sensor 1)	119		Fully released	0.45 - 1.0
M160	104 (AFF Sellsol 1)	119	Accelerator pedal	Fully depressed	4.4 - 4.8
IVI IOO	108 (APP sensor 2)	115	Accelerator pedar	Fully released	0.22 - 0.5
	100 (AFF Selisol 2)	113		Fully depressed	2.1 - 2.5
					·

Is the inspection result normal?

YES >> INSPECTION END

P2122, P2123 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

NO >> GO TO 2.

2.REPLACE ACCELERATOR PEDAL ASSEMBLY

- 1. Replace accelerator pedal assembly.
- 2. Perform <u>EC-1070</u>, "Special Repair Requirement".

>> INSPECTION END

Special Repair Requirement

INFOID:0000000003958988

1. PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING

Refer to <u>EC-582</u>, "ACCELERATOR PEDAL RELEASED POSITION LEARNING: Special Repair Requirement".

>> GO TO 2.

2.PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Refer to EC-582, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement".

>> GO TO 3.

3. PERFORM IDLE AIR VOLUME LEARNING

Refer to EC-583, "IDLE AIR VOLUME LEARNING: Special Repair Requirement".

>> END

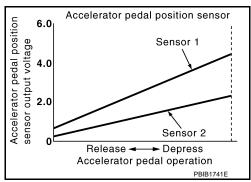
P2127, P2128 APP SENSOR

Description INFOID:0000000003958989

The accelerator pedal position sensor is installed on the accelerator pedal assembly. The sensor detects the accelerator position and sends a signal to the ECM.

Accelerator pedal position sensor has two sensors. These sensors are a kind of potentiometer which transform the accelerator pedal position into output voltage, and emit the voltage signals to the ECM. The ECM judges the current opening angle of the accelerator pedal from these signals and controls the throttle control motor based on these signals.

Idle position of the accelerator pedal is determined by the ECM receiving the signal from the accelerator pedal position sensor. The ECM uses this signal for engine operations such as fuel cut.



DTC Logic INFOID:0000000003958990

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P2127	Accelerator pedal position sensor 2 circuit low input	An excessively low voltage from the APP sensor 2 is sent to ECM.	Harness or connectors (Accelerator pedal position sensor 2 circuit is open or shorted.)
P2128	Accelerator pedal position sensor 2 circuit high input	An excessively high voltage from the APP sensor 2 is sent to ECM.	shorted.) (Battery current sensor circuit is shorted.) [Camshaft position sensor (bank 1) circuit is shorted.] (Crankshaft position sensor circuit is shorted.) (EVAP control system pressure sensor circuit is shorted.) [EVT control position sensor (bank 1) circuit is shorted.] (Manifold pressure sensor circuit is shorted.) Accelerator pedal position sensor (APP sensor 2) Battery current sensor Camshaft position sensor (bank 1) Crankshaft position sensor EVAP control system pressure sensor EVAP control system pressure sensor Schaust valve timing control position sensor (bank 1) Manifold pressure sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 8 V at idle.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- Start engine and let it idle for 1 second.
- Check DTC.

Is DTC detected?

YES >> Go to EC-1072, "Diagnosis Procedure".

NO >> INSPECTION END

EC-1071 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

F

M

Ν

P2127, P2128 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Diagnosis Procedure

INFOID:0000000003958991

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2. CHECK ACCELERATOR PEDAL POSITION SENSOR 2 POWER SUPPLY CIRCUIT-I

- 1. Disconnect accelerator pedal position (APP) sensor harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between APP sensor harness connector and ground.

APP sensor		Ground	Voltage (V)	
Connector	Connector Terminal			
E112 (Without ICC)	6	Ground	Approx. 5	
E116 (With ICC)	3	Ground	πρρίολ. σ	

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 3.

3. CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT-II

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check the continuity between APP sensor harness connector and ECM harness connector.

APP sensor		ECM		Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
E112 (Without ICC)	6	M160	M160	99	Existed
E116 (With ICC)	3	101100	39	LAISIEG	

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M6, E106
- · Harness for open or short between ECM and APP sensor

>> Repair open circuit.

5. CHECK SENSOR POWER SUPPLY CIRCUIT

Check harness for short to power and short to ground, between the following terminals.

ECM		Sensor		
Connector	Terminal	Name	Connector	Terminal
	87	Crankshaft position sensor	F2	1
	91	Camshaft position sensor (bank 1)	F84	1
F111	91	EVT control position sensor (bank 1)	F59	1
95		Battery current sensor	E21	1
		EVAP control system pressure sensor	B252	3
		Manifold pressure sensor	F65	1
M160 99		APP sensor (Without ICC)	E112	6
		APP sensor (with ICC)	E116	3

Is the inspection result normal?

YES >> GO TO 6.

>> Repair short to ground or short to power in harness or connectors. NO

6.CHECK COMPONENTS

Check the following.

- Crankshaft position sensor (Refer to <u>EC-870, "Component Inspection"</u>.)
- Camshaft position sensor (bank 1) (Refer to <u>EC-875, "Component Inspection"</u>.)
- Exhaust valve timing control position sensor (bank 1) (Refer to EC-972, "Component Inspection".)
- EVAP control system pressure sensor (Refer to <u>EC-911, "Component Inspection"</u>.)
- Manifold pressure sensor (Refer to <u>EC-1115</u>, "Component Inspection".)

Is the inspection result normal?

YES >> GO TO 13.

NO >> Replace malfunctioning component.

7.CHECK APP SENSOR 2 GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- Disconnect ECM harness connector.
- Check the continuity between APP sensor harness connector and ECM harness connector.

APP sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E112 (Without ICC)	2	M160	115	Existed
E116 (With ICC)	2	IVITOO	113	LXISIGU

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 9.

NO >> GO TO 8.

8.DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M6, E106
- · Harness for open or short between ECM and APP sensor

>> Repair open circuit, short to ground or short to power in harness or connectors.

9.check app sensor 2 input signal circuit for open and short

Check the continuity between APP sensor harness connector and ECM harness connector.

EC

Α

Е

F

N

APP sensor		EC	Continuity		
Connector	Terminal	Connector Terminal		Continuity	
E112 (Without ICC)	1	M160	108	Existed	
E112 (With ICC)	6	IVITOO	100	LAISIGU	

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 11. NO >> GO TO 10.

10. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M6, E106
- Harness for open or short between ECM and APP sensor

>> Repair open circuit, short to ground or short to power in harness or connectors.

11. CHECK APP SENSOR

Refer to EC-1074, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 13. NO >> GO TO 12.

12. REPLACE ACCELERATOR PEDAL ASSEMBLY

- 1. Replace accelerator pedal assembly.
- 2. Perform EC-1075, "Special Repair Requirement".

>> INSPECTION END

13. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000004032262

1. CHECK ACCELERATOR PEDAL POSITION SENSOR

- 1. Turn ignition switch OFF.
- 2. Reconnect all harness connectors disconnected.
- 3. Turn ignition switch ON.
- 4. Check the voltage ECM harness connector terminals under the following conditions.

ECM					
Connector	+	_	Condition		Voltage (V)
Connector	Terminal	Terminal			
	104 (APP sensor 1) 119 108 (APP sensor 2) 115		- Accelerator pedal	Fully released	0.45 - 1.0
M160				Fully depressed	4.4 - 4.8
WITOO				Fully released	0.22 - 0.5
			Fully depressed	2.1 - 2.5	

Is the inspection result normal?

YES >> INSPECTION END

P2127, P2128 APP SENSOR [VK50VE] < DTC/CIRCUIT DIAGNOSIS > NO >> GO TO 2. 2. REPLACE ACCELERATOR PEDAL ASSEMBLY Α Replace accelerator pedal assembly. 2. Perform <u>EC-1075</u>, "Special Repair Requirement". EC >> INSPECTION END Special Repair Requirement INFOID:0000000004032263 1.PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING D Refer to EC-582, "ACCELERATOR PEDAL RELEASED POSITION LEARNING: Special Repair Requirement". Е >> GO TO 2. 2.PERFORM THROTTLE VALVE CLOSED POSITION LEARNING Refer to EC-582, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement". >> GO TO 3. 3.PERFORM IDLE AIR VOLUME LEARNING Refer to EC-583, "IDLE AIR VOLUME LEARNING: Special Repair Requirement". Н >> END K L M Ν

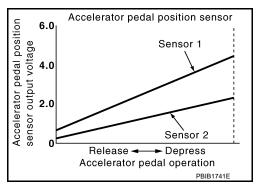
P2138 APP SENSOR

Description

The accelerator pedal position sensor is installed on the accelerator pedal assembly. The sensor detects the accelerator position and sends a signal to the ECM.

Accelerator pedal position sensor has two sensors. These sensors are a kind of potentiometer which transform the accelerator pedal position into output voltage, and emit the voltage signals to the ECM. The ECM judges the current opening angle of the accelerator pedal from these signals and controls the throttle control motor based on these signals.

Idle position of the accelerator pedal is determined by the ECM receiving the signal from the accelerator pedal position sensor. The ECM uses this signal for engine operations such as fuel cut.



DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P2138 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. Refer to <u>EC-959, "DTC Logic"</u>.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P2138	Accelerator pedal position sensor circuit range/performance	Rationally incorrect voltage is sent to ECM compared with the signals from APP sensor 1 and APP sensor 2.	Harness or connectors (APP sensor 1 or 2 circuit is open or shorted.) [CKP sensor circuit is shorted.] [CMP sensor (bank 1) circuit is shorted.] [EVT control position sensor (bank 1) circuit is shorted.] (Battery current sensor circuit is shorted.) (EVAP control system pressure sensor circuit is shorted.) (Manifold pressure sensor circuit is shorted.) Accelerator pedal position sensor (APP sensor 1 or 2) Crankshaft position sensor Camshaft position sensor (bank 1) Exhaust valve timing control position sensor (bank 1) Battery current sensor EVAP control system pressure sensor Manifold pressure sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 8 V at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- Start engine and let it idle for 1 second.
- Check DTC.

Is DTC detected?

YES >> Go to EC-1077, "Diagnosis Procedure".

NO >> INSPECTION END

Revision: 2009 March EC-1076 2009 FX35/FX50

P2138 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Diagnosis Procedure

INFOID:0000000003958996

Α

EC

D

Е

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2. CHECK ACCELERATOR PEDAL POSITION SENSOR 1 POWER SUPPLY CIRCUIT

- 1. Disconnect accelerator pedal position (APP) sensor harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between APP sensor harness connector and ground.

APP se	ensor	Ground	Voltage (V)	
Connector Terminal		Giodila	voltage (v)	
E112 (Without ICC)	5	Ground	Approx. 5	
E116 (With ICC)	5	Ciouna	πρρίολ. σ	

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M6, E106
- Harness for open or short between ECM and APP sensor
 - >> Repair open circuit, short to ground or short to power in harness or connectors.

4. CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT-I

- Turn ignition switch ON.
- 2. Check the voltage between APP sensor harness connector and ground.

APP se	ensor	Ground	Voltage (V)	
Connector Terminal		Giodila	voltage (v)	
E112 (Without ICC)	6	Ground	Approx. 5	
E116 (With ICC)	3	Giodila	дрргох. 3	

Is the inspection result normal?

YES >> GO TO 9.

NO >> GO TO 5.

5. CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT-II

- 1. Turn ignition switch OFF.
- Disconnect ECM harness connector.
- 3. Check the continuity between APP sensor harness connector and ECM harness connector.

L

N

Р

2009 FX35/FX50

APP sensor		ECM		Continuity
Connector Terminal		Connector	Terminal	Continuity
E112 (Without ICC)) 6 M160		99	Existed
E112 (With ICC)	3	IVITOO	99	LXISIGU

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M6, E106
- Harness for open or short between ECM and accelerator pedal position sensor

>> Repair open circuit.

7. CHECK SENSOR POWER SUPPLY CIRCUIT

Check harness for short to power and short to ground, between the following terminals.

ECM		Sensor				
Connector	Terminal	Name	Connector	Terminal		
87		Crankshaft position sensor	F2	1		
	91	Camshaft position sensor (bank 1)	F84	1		
F111	91	EVT control position sensor (bank 1)	F59	1		
1 111	95	Battery current sensor	E21	1		
		EVAP control system pressure sensor	B252	3		
		Manifold pressure sensor	F65	1		
M160	99	APP sensor (Without ICC)	E112	6		
		APP sensor (with ICC)	E116	3		

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair short to ground or short to power in harness or connectors.

8. CHECK COMPONENTS

Check the following.

- Crankshaft position sensor (Refer to EC-870, "Component Inspection".)
- Camshaft position sensor (bank 1) (Refer to <u>EC-875</u>, "Component Inspection".)
- Exhaust valve timing control position sensor (bank 1) (Refer to EC-972, "Component Inspection".)
- EVAP control system pressure sensor (Refer to EC-911, "Component Inspection".)
- Manifold pressure sensor (Refer to <u>EC-1115, "Component Inspection"</u>.)

Is the inspection result normal?

YES >> GO TO 15.

NO >> Replace malfunctioning component.

${f 9.}$ CHECK APP SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- Disconnect ECM harness connector.
- 3. Check the continuity between APP sensor harness connector and ECM harness connector.

APP sensor		ECM		Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
E112	4	M160	119	Existed	
(Without ICC)	2		115		
E116	1	M160	119	Existed	
(With ICC)	2	IVITOU	115	Existed	

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 11.

NO >> GO TO 10.

10. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M6, E106
- Harness for open or short between ECM and accelerator pedal position sensor

>> Repair open circuit, short to ground or short to power in harness or connectors.

11. CHECK APP SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between APP sensor harness connector and ECM harness connector.

APP sensor		ECM		Continuity	
Connector	Connector Terminal		Terminal	Continuity	
E112	3	M160	M160	104	Existed
(Without ICC)	1		108	LXISIGU	
E116	4	M160	104	Existed	
(With ICC)	6	IVITOO	108	LXISIGU	

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 13. NO >> GO TO 12.

12. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M6, E106
- Harness for open or short between ECM and accelerator pedal position sensor

>> Repair open circuit, short to ground or short to power in harness or connectors.

13. CHECK APP SENSOR

Refer to EC-1080, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 15. NO >> GO TO 14.

 $14.\mathtt{REPLACE}$ ACCELERATOR PEDAL ASSEMBLY

- Replace accelerator pedal assembly.
- Perform EC-1080, "Special Repair Requirement".

>> INSPECTION END

15. CHECK INTERMITTENT INCIDENT

EC-1079 Revision: 2009 March 2009 FX35/FX50

EC

Α

D

F

Н

Ν

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000004032264

1. CHECK ACCELERATOR PEDAL POSITION SENSOR

- 1. Turn ignition switch OFF.
- 2. Reconnect all harness connectors disconnected.
- 3. Turn ignition switch ON.
- 4. Check the voltage ECM harness connector terminals under the following conditions.

ECM						
Connector	+	_	Condition		Voltage (V)	
Connector	Terminal	Terminal				
M160	104 (APP sensor 1)	119	- Accelerator pedal	Fully released	0.45 - 1.0	
				Fully depressed	4.4 - 4.8	
	108 (APP sensor 2) 115	44.5		Fully released	0.22 - 0.5	
			Fully depressed	2.1 - 2.5		

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2. REPLACE ACCELERATOR PEDAL ASSEMBLY

- 1. Replace accelerator pedal assembly.
- 2. Perform EC-1080, "Special Repair Requirement".

>> INSPECTION END

Special Repair Requirement

INFOID:0000000004032265

1. PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING

Refer to EC-582, "ACCELERATOR PEDAL RELEASED POSITION LEARNING: Special Repair Requirement".

>> GO TO 2.

2. PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Refer to EC-582, "THROTTLE VALVE CLOSED POSITION LEARNING: Special Repair Requirement".

>> GO TO 3.

3. PERFORM IDLE AIR VOLUME LEARNING

Refer to EC-583, "IDLE AIR VOLUME LEARNING: Special Repair Requirement".

>> END

Α

D

K

M

Ν

Р

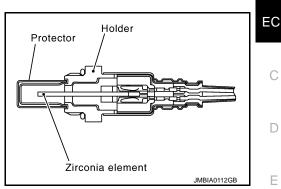
P2A00, P2A03 A/F SENSOR 1

Description INFOID:0000000004032266

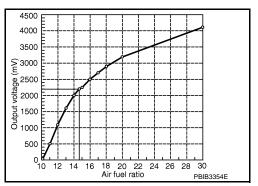
The air fuel ratio (A/F) sensor 1 is a planar one-cell limit current sensor. The sensor element of the A/F sensor 1 is composed an electrode layer, which transports ions. It has a heater in the element.

The sensor is capable of precise measurement $\lambda = 1$, but also in the lean and rich range. Together with its control electronics, the sensor outputs a clear, continuous signal throughout a wide λ range.

The exhaust gas components diffuse through the diffusion layer at the sensor cell. An electrode layer is applied voltage, and this current relative oxygen density in lean. Also this current relative hydrocarbon density in rich.



Therefore, the A/F sensor 1 is able to indicate air fuel ratio by this electrode layer of current. In addition, a heater is integrated in the sensor to ensure the required operating temperature of approximately 800°C (1,472°F).



DTC Logic INFOID:0000000003959000

DTC DETECTION LOGIC

To judge the malfunction, the A/F signal computed by ECM from the A/F sensor 1 signal is monitored so it will not shift to LEAN side or RICH side.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P2A00	Air fuel ratio (A/F) sensor 1 (bank 1) circuit range/performance	The output voltage computed by ECM from the A/F sensor 1 signal shifts to the lean side	A/F sensor 1 A/F sensor 1 heater
P2A03	Air fuel ratio (A/F) sensor 1 (bank 2) circuit range/performance	 The A/F signal computed by FCM from the 	Fuel pressureFuel injectorIntake air leaks

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 11 V at idle.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- Clear the mixture ratio self-learning value. Refer to EC-586, "MIXTURE RATIO SELF-LEARNING VALUE CLEAR: Special Repair Requirement".
- Turn ignition switch OFF and wait at least 10 seconds.

EC-1081 Revision: 2009 March 2009 FX35/FX50

P2A00, P2A03 A/F SENSOR 1

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

- 3. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.
- 5. Start engine and keep the engine speed between 3,500 and 4,000 rpm for 1 minute under no load.
- Let engine idle for 1 minute.
- 7. Keep engine speed between 2,500 and 3,000 rpm for 20 minutes.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-1082, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003959001

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.RETIGHTEN A/F SENSOR 1

Loosen and retighten the A/F sensor 1. Refer to EM-205, "Disassembly and Assembly".

>> GO TO 3.

3.CHECK A/F SENSOR 1 CONNECTOR

- 1. Disconnect A/F sensor 1 harness connector.
- Check that water is not inside connectors.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace harness connector.

4. CHECK FOR INTAKE AIR LEAKAGE

- 1. Reconnect A/F sensor 1 harness connector.
- Start engine and run it at idle.
- Listen for an intake air leakage after the mass air flow sensor.

Is intake air leakage detected?

YES >> Repair or replace malfunctioning part.

NO >> GO TO 5.

5. CLEAR THE MIXTURE RATIO SELF-LEARNING VALUE

- Clear the mixture ratio self-learning value. Refer to <u>EC-586, "MIXTURE RATIO SELF-LEARNING VALUE CLEAR: Special Repair Requirement"</u>.
- 2. Run engine for at least 10 minutes at idle speed.

Is the 1st trip DTC P0171, P0172, P0174 or P0175 detected? Is it difficult to start engine?

YES >> Perform trouble diagnosis for DTC P0171, P0174 or P0172, P0175. Refer to <u>EC-835, "Diagnosis Procedure"</u>.

NO >> GO TO 6.

6.CHECK A/F SENSOR 1 POWER SUPPLY CIRCUIT

- Turn ignition switch OFF and then turn it ON.
- Disconnect A/F sensor 1 harness connector.
- Check the voltage between A/F sensor 1 harness connector and ground.

DTC	A/F sensor 1			Ground	Voltage
DIC	Bank	Connector	Terminal	Giodila	voltage
P2A00	1	F67	4	Ground	Battery voltage
P2A03	2	F68	4	Giodila	Dattery Voltage

EC

Α

Is the inspection result normal?

YES >> GO TO 8. NO >> GO TO 7. С

D

Е

F

Н

K

Ν

Р

7.DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E10, F10
- IPDM E/R harness connector E7
- 15 A fuse (No. 46)
- Harness for open or short between A/F sensor 1 and fuse

>> Repair or replace harness or connectors.

8.check a/f sensor 1 input signal circuit for open and short

- Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check the continuity between A/F sensor 1 harness connector and ECM harness connector.

DTC	A/F sensor 1			EC	Continuity	
DIC	Bank	Connector	Terminal	Connector Terminal		Continuity
P2A00	1	F67	1		81	
PZAUU	'	107	2	F111	82	Existed
P2A03 2		2 F68	1	1 111	85	LXISIGU
FZAU3	2	1 00	2		86	

4. Check the continuity between A/F sensor 1 harness connector and ground or ECM harness connector and ground.

DTC	A/F sensor 1		ECM		Ground	Continuity	
БТО	Bank Connecto		Terminal	Connector	Terminal	Olouliu	Continuity
P2A00	1	F67	1		81		
PZAUU	'	107	2	F111	82	Ground	Not existed
P2A03	2 F68	F68	1		85		
		1 00	2		86		

5. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

9.CHECK A/F SENSOR 1 HEATER

Refer to EC-758, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 10. NO >> GO TO 11.

40

10. CHECK INTERMITTENT INCIDENT

Perform <u>GI-35</u>, "Intermittent Incident". Is the inspection result normal?

Revision: 2009 March

EC-1083

2009 FX35/FX50

P2A00, P2A03 A/F SENSOR 1

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

YES >> GO TO 11.

NO >> Repair or replace malfunctioning part.

11. REPLACE AIR FUEL RATIO (A/F) SENSOR 1

Replace air fuel ratio (A/F) sensor 1.

CAUTION:

- Discard any A/F sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new A/F sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J-43897-12)] and approved anti-seize lubricant (commercial service tool).

Will CONSULT-III be used?

YES >> GO TO 12.

NO >> GO TO 13.

12.CONFIRM A/F ADJUSTMENT DATA

(P) With CONSULT-III

- 1. Turn ignition switch ON.
- 2. Select "A/F ADJ-B1" and "A/F ADJ-B2" in "DATA MONITOR" mode with CONSULT-III.
- 3. Check that "0.000" is displayed on CONSULT-III screen.

Is "0.000" displayed?

YES >> INSPECTION END

NO >> GO TO 13.

13. CLEAR THE MIXTURE RATIO SELF-LEARNING VALUE

Clear the mixture ratio self-learning value. Refer to <u>EC-586</u>, "MIXTURE RATIO SELF-LEARNING VALUE <u>CLEAR</u>: Special Repair Requirement".

Will CONSULT-III be used?

YES >> GO TO 14.

NO >> INSPECTION END

14.CONFIRM A/F ADJUSTMENT DATA

(II) With CONSULT-III

- 1. Turn ignition switch ON.
- 2. Select "A/F ADJ-B1" and "A/F ADJ-B2" in "DATA MONITOR" mode with CONSULT-III.
- 3. Check that "0.000" is displayed on CONSULT-III screen.

>> INSPECTION END

ASCD BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

INFOID:0000000003959003

ASCD BRAKE SWITCH

Description INFOID:0000000003959002

When the brake pedal is depressed, ASCD brake switch is turned OFF and stop lamp switch is turned ON. ECM detects the state of the brake pedal by two kinds of input (ON/OFF signal).

Refer to EC-632, "System Description" for the ASCD function.

Component Function Check

CHECK ASCD BRAKE SWITCH FUNCTION

- With CONSULT-III
- 1. Turn ignition switch ON.
- Select "BRAKE SW1" in "DATA MONITOR" mode with CONSULT-III.
- Check "BRAKE SW1" indication under the following conditions.

Monitor item	Co	Indication	
BRAKE SW1 (ASCD brake switch)	Brake pedal	Slightly depressed	OFF
	Brake pedal	Fully released	ON

Without CONSULT-III

- Turn ignition switch ON.
- Check the voltage between ECM harness connector terminals as per the following.

ECM					
Connector	+	_	Condition		Voltage (V)
Connector	Terminal	Terminal			
M160	1160 (A200 L. 1.1		Slightly depressed	Approx. 0	
W160	(ASCD brake switch signal)	120	Біаке рецаі	Fully released	Battery voltage

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-1085, "Diagnosis Procedure".

Diagnosis Procedure

1. CHECK ASCD BRAKE SWITCH POWER SUPPLY CIRCUIT

- Turn ignition switch OFF.
- Disconnect ASCD brake switch harness connector. 2.
- Turn ignition switch ON.
- Check the voltage between ASCD brake switch harness connector and ground.

ASCD bra	ake switch	Ground	Voltage	
Connector	Terminal	Ground	voltage	
E109	1	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E103
- 10 A fuse (No. 3)
- Harness for open or short between ASCD brake switch and fuse

EC

Α

D

Е

K

INFOID:0000000003959004

Ν

Р

EC-1085 Revision: 2009 March 2009 FX35/FX50

< DTC/CIRCUIT DIAGNOSIS >

>> Repair open circuit or short to ground in harness or connectors.

${f 3.}$ CHECK ASCD BRAKE SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check the continuity between ASCD brake switch harness connector and ECM harness connector.

	ASCD bra	ke switch	EC	Continuity	
	Connector	Terminal	Connector	Terminal	Continuity
•	E109	2	M160	117	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5. NO >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E106, M6
- · Harness for open or short between ECM and ASCD brake switch

>> Repair open circuit, short to ground or short to power in harness or connectors.

5. CHECK ASCD BRAKE SWITCH

Refer to EC-1086, "Component Inspection (ASCD Brake Switch)".

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace ASCD brake switch.

6. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection (ASCD Brake Switch)

INFOID:0000000004032267

1. CHECK ASCD BRAKE SWITCH-I

- 1. Turn ignition switch OFF.
- Disconnect ASCD brake switch harness connector.
- 3. Check the continuity between ASCD brake switch terminals under the following conditions.

Terminals	Condition		Continuity
1 and 2	Brake pedal	Fully released	Existed
		Slightly depressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2. CHECK ASCD BRAKE SWITCH-II

- 1. Adjust ASCD brake switch installation. Refer to BR-7, "Inspection and Adjustment".
- 2. Check the continuity between ASCD brake switch terminals under the following conditions.

Terminals	C	Continuity	
1 and 2	Brake pedal	Fully released	Existed
	вгаке редаг	Slightly depressed	Not existed

ASCD BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS > [VK50VE]

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace ASCD brake switch.

_ .

Α

EC

С

D

Е

F

G

Н

1

J

Κ

L

M

Ν

0

Ρ

ASCD INDICATOR

Description INFOID:000000003959006

ASCD operation status is indicated by two indicators (CRUISE and SET) and CRUISE lamp in combination meter.

CRUISE indicator is displayed to indicated that ASCD system is ready for operation when MAIN switch on ASCD steering switch is turned ON.

SET indicator is displayed when the following conditions are met.

- CRUISE indicator is displayed.
- SET/COAST switch on ASCD steering switch is turned ON while vehicle speed is within the range of the ASCD setting.

SET indicator is displayed during ASCD control.

Refer to EC-632, "System Description" for the ASCD function.

Component Function Check

INFOID:0000000003959007

1. CHECK ASCD INDICATOR FUNCTION

Check ASCD indicator under the following conditions.

ASCD INDICATOR	CON	SPECIFICATION	
CRUISE LAMP	Ignition switch: ON	MAIN switch: Pressed at the 1st time → at the 2nd time	$ON \to OFF$
	MAIN switch: ON	ASCD: Operating	ON
SET LAMP	 When vehicle speed is be- tween 40 km/h (25 MPH) and 144 km/h (89 MPH) 	ASCD: Not operating	OFF

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-1088, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003959008

1. CHECK DTC

Check that DTC UXXXX is not displayed.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Perform trouble diagnosis for DTC UXXXX.

2.CHECK DTC WITH "UNIFIED METER AND A/C AMP."

Refer to MWI-45, "CONSULT-III Function (METER/M&A)".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace malfunctioning part.

3.check intermittent incident

Refer to GI-35, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace combination meter.

NO >> Repair or replace malfunctioning part.

INFOID:0000000003959010

INFOID:000000000395901:

COOLING FAN

Description INFOID:0000000003959009

COOLING FAN CONTROL MODULE

Cooling fan control module receives ON/OFF pulse duty signal from IPDM E/R. Corresponding to this ON/OFF pulse duty signal, cooling fan control module sends cooling fan motor operating voltage to cooling fan motor. The revolution speed of cooling fan motor is controlled by duty cycle of the voltage.

COOLING FAN MOTOR

Cooling fan motor receives cooling fan motor operating voltage from cooling fan control module. The revolution speed of cooling fan motor is controlled by duty cycle of the voltage.

Component Function Check

1. CHECK COOLING FAN FUNCTION

- With CONSULT-III
- 1. Turn ignition switch ON.
- Perform "FAN DUTY CONTROL" in "ACTIVE TEST" mode with CONSULT-III.
- Check that cooling fan speed varies according to the percentage.
- Without CONSULT-III
- 1. Perform IPDM E/R auto active test and check cooling fan motors operation, refer to PCS-11, "Diagnosis Description".
- 2. Check that cooling fan operates.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-1089, "Diagnosis Procedure".

Diagnosis Procedure

${f 1}$.CHECK COOLING FAN CONTROL MODULE POWER SUPPLY CIRCUIT-I

- 1. Turn ignition switch OFF.
- 2. Disconnect cooling fan control module harness connectors E37, E38.
- Turn ignition switch ON.
- Check the voltage between cooling fan control module harness connector and ground.

Cooling fan control me	Ground	Voltage		
Connector Termina		Giodila	voltage	
E37 (Cooling fan control module 1)	3	Ground	Battery voltage	
E38 (Cooling fan control module 2)	3	Ground	battery voltage	

Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 7.

2.CHECK COOLING FAN CONTROL MODULE GROUND CIRCUIT

- Turn ignition switch OFF.
- Check the continuity between cooling fan control module harness connector and ground.

EC-1089 Revision: 2009 March 2009 FX35/FX50

EC

Α

C

D

Е

F

Н

K

N

Р

Cooling fan control mo	Ground	Continuity	
Connector Terminal		Giodila	Continuity
E37 (Cooling fan control module 1)	1	Ground	Evistod
E38 (Cooling fan control module 2)	1	Glound	Existed

3. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit or short to power in harness or connectors.

3.CHECK IPDM E/R GROUND CIRCUIT

- 1. Disconnect IPDM E/R harness connectors E5, E6.
- 2. Check the continuity between IPDM E/R harness connector and ground.

IPDM	E/R	Ground	Continuity
Connector	onnector Terminal		Continuity
E5	12	Ground	Existed
E6	41	Giodila	LXISIEU

3. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit or short to power in harness or connectors.

4. CHECK COOLING FAN CONTROL SIGNAL CIRCUIT

- 1. Disconnect IPDM E/R harness connector E9.
- Check the continuity between IPDM E/R harness connector and cooling fan control module harness connector.

IPDI	M E/R	Cooling fan control module		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E9	97	E37 (Cooling fan control module 1)	2	Existed
	91	E38 (Cooling fan control module 2)	2	Existed

3. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

5.check cooling fan control module output signal circuit

- 1. Reconnect all harness connectors disconnected.
- 2. Disconnect cooling fan control module harness connectors E301, E303.
- 3. Turn ignition switch ON.
- 4. Check the voltage between cooling fan control module terminals and ground.

Cooling fan control r	Ground	Voltage	
Connector	nnector Terminal		
(Cooling fan control module 1)	4	Ground	Battery voltage
(Cooling fan control module 2)	6	Glound	battery voltage

COOLING FAN

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Α

EC

D

Е

K

N

Р

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace malfunctioning cooling fan control module.

6.CHECK COOLING FAN MOTORS -1 AND -2

Refer to EC-1092, "Component Inspection (Cooling Fan Motor)".

Is the inspection result normal?

YES >> GO TO 11.

NO >> Replace malfunctioning cooling fan motor.

7.CHECK COOLING FAN CONTROL MODULE POWER SUPPLY CIRCUIT-II

- 1. Turn ignition switch OFF.
- 2. Disconnect cooling fan relay-1 and cooling fan relay-2.
- 3. Check the voltage between cooling fan relay harness connector and ground.

Cooling fan relay		Ground	Voltage	
Connector	ector Terminal			
E15 (Cooling fan relay-1)	3	Ground	Battery voltage	
E17 (Cooling fan relay-2)	3	Ground	battery voltage	

- 4. Turn ignition switch ON.
- Check the voltage between cooling fan relay harness connector and ground.

Cooling fan re	elay	Ground	Voltage	
Connector Terminal		Giodila	voltage	
E15 (Cooling fan relay-1)	1	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 9.

NO >> GO TO 8.

8. DETECT MALFUNCTIONING PART

Check the following.

- 10 A fuse (No. 42)
- 50 A fusible link (letter O)
- 50 A fusible link (letter S)
- IPDM E/R harness connector E7
- Harness for open or short between cooling fan relay and fuse
- Harness for open or short between cooling fan relay and battery

>> Repair open circuit, short to ground or short to power in harness or connectors.

9.check cooling fan control module power supply circuit-iii

- Turn ignition switch OFF.
- Disconnect IPDM E/R harness connector E6.
- 3. Check the continuity between cooling fan relay harness connector and IPDM E/R harness connector.

Cooling fan rel	ay	IPDN	Continuity	
Connector	Terminal	Connector	Terminal	Continuity
E15 (Cooling fan relay-1)	2	E6	42	Existed

4. Check the continuity between cooling fan relay harness connector and cooling fan control module harness connector.

Cooling fan re	lay	Cooling fan control module		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E15 (Cooling fan relay-1)	5	E37 (Cooling fan control module-1)	3	Existed
E17 (Cooling fan relay-2)	5	E38 (Cooling fan control module-2)	3	Existed

Check the continuity between cooling fan relay-1 harness connector and cooling fan relay-2 harness connector.

	Continuity			
Connector	Terminal Connector Terminal			Continuity
E15 (Cooling fan relay-1)	5	E17 (Cooling fan relay-2)	1	Existed

6. Check the continuity between cooling fan relay-2 harness connector and ground.

Cooling fan relay		Ground	Continuity	
Connector	Terminal		Continuity	
E17 (Cooling fan relay-1)	2	Ground	Existed	

7. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

10. CHECK COOLING FAN RELAYS -1 AND -2

Refer to EC-1093, "Component Inspection (Cooling Fan Relay)".

Is the inspection result normal?

YES >> GO TO 11.

NO >> Replace malfunctioning cooling fan relay.

11. CHECK INTERMITTENT INCIDENT

Perform GI-35, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace IPDM E/R.

NO >> Repair or replace harness connectors.

Component Inspection (Cooling Fan Motor)

INFOID:0000000003959012

1. CHECK COOLING FAN MOTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect cooling fan control module harness connectors E301, E303.
- Supply cooling fan control module harness connector terminals with battery voltage as per the following, and check operation.

Cooling fan control module					
Motor	Connector	Terminal		Operation	
IVIOLOI	Connector	(+)			
1	E301	4	5	Cooling fan operates.	
2	E303	6	7	Cooling ran operates	

Is the inspection result normal?

COOLING FAN

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

NO >> Replace malfunctioning cooling fan motor.

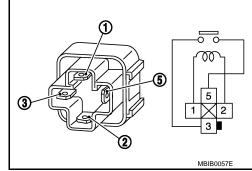
Component Inspection (Cooling Fan Relay)

INFOID:0000000003959013

1. CHECK COOLING FAN RELAY

- 1. Turn ignition switch OFF.
- 2. Remove cooling fan relay.
- 3. Check the continuity between cooling fan relay terminals under the following conditions.

Terminals	Conditions	Continuity
3 and 5	12 V direct current supply between terminals 1 and 2	Existed
o and o	No current supply	Not existed



Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace cooling fan relay.

G

Α

EC

C

 D

Е

Н

K

L

M

Ν

0

Р

Revision: 2009 March

ELECTRICAL LOAD SIGNAL

Description INFOID:000000003959014

The electrical load signal (Rear window defogger switch signal, headlamp switch signal, heater fan switch signal, etc.) is transferred via the CAN communication line.

Component Function Check

INFOID:0000000003959015

1. CHECK REAR WINDOW DEFOGGER SWITCH FUNCTION

- 1. Turn ignition switch ON.
- 2. Select "DATA MONITOR" mode with CONSULT-III.
- 3. Select "LOAD SIGNAL" and check indication under the following conditions.

Monitor item	Condition		Indication
LOAD SIGNAL	Rear window defoager switch	ON	ON
LOAD SIGNAL	LOAD SIGNAL Rear window defogger switch	OFF	OFF

Is the inspection result normal?

YES >> GO TO 2.

NO >> Go to EC-1094, "Diagnosis Procedure".

2. CHECK LIGHTING SWITCH FUNCTION

Check "LOAD SIGNAL" indication under the following conditions.

Monitor item	Condition		Condition		Indication
LOAD SIGNAL	Lighting switch	ON at 2nd position	ON		
LOAD SIGNAL	Lighting switch	OFF	OFF		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Go to EC-1094, "Diagnosis Procedure".

3.CHECK HEATER FAN CONTROL SWITCH FUNCTION

Select "HEATER FAN SW" and check indication under the following conditions.

Monitor item	Condition		Indication
HEATED EAN SW	Heater fan control switch	ON	ON
HEATER FAN SW Heater fan control switch		OFF	OFF

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-1094, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003959016

1. INSPECTION START

Confirm the malfunctioning circuit (rear window defogger, headlamp or heater fan). Refer to <u>EC-1094, "Component Function Check"</u>.

Which circuit is related to the incident?

Rear window defogger>>GO TO 2.

Headlamp>>GO TO 3.

Heater fan>>GO TO 4.

2. CHECK REAR WINDOW DEFOGGER SYSTEM

Refer to DEF-3, "Work Flow".

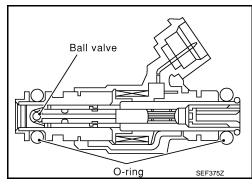
ELECTRICAL LOAD SIGNAL		
< DTC/CIRCUIT DIAGNOSIS >	[VK50VE]	
>> INSPECTION END		А
3.CHECK HEADLAMP SYSTEM		A
Refer to EXL-5, "Work Flow".	Ī	
>> INSPECTION END		EC
4.CHECK HEATER FAN CONTROL SYSTEM	•	
Refer to HA-4, "Work Flow".		С
>> INSPECTION END		D
		Е
		_
		F
		G
		Н
		1
		J
		K
		L
		M
		Ν
		0
		Р

Revision: 2009 March **EC-1095** 2009 FX35/FX50

FUEL INJECTOR

Description INFOID:000000003959017

The fuel injector is a small, precise solenoid valve. When the ECM supplies a ground to the fuel injector circuit, the coil in the fuel injector is energized. The energized coil pulls the ball valve back and allows fuel to flow through the fuel injector into the intake manifold. The amount of fuel injected depends upon the injection pulse duration. Pulse duration is the length of time the fuel injector remains open. The ECM controls the injection pulse duration based on engine fuel needs.



Component Function Check

INFOID:0000000003959018

1.INSPECTION START

Turn ignition switch to START.

Are any cylinders ignited?

YES >> GO TO 2.

NO >> Go to EC-1096, "Diagnosis Procedure".

2. CHECK FUEL INJECTOR FUNCTION

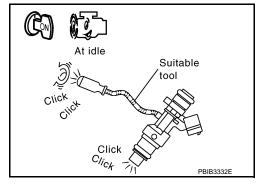
- (P) With CONSULT-III
- 1. Start engine.
- Perform "POWER BALANCE" in "ACTIVE TEST" mode with CONSULT-III.
- 3. Check that each circuit produces a momentary engine speed drop.
- ₩ Without CONSULT-III
- 1. Start engine.
- 2. Listen to each fuel injector operating sound.

Clicking sound should be heard.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-1096, "Diagnosis Procedure".



Diagnosis Procedure

INFOID:0000000003959019

1. CHECK FUEL INJECTOR POWER SUPPLY CIRCUIT

- Turn ignition switch OFF.
- Disconnect fuel injector harness connector.
- 3. Turn ignition switch ON.
- Check the voltage between fuel injector harness connector and ground.

Α

EC

D

Е

F

Р

	Fuel injector		Ground	Voltogo
Cylinder	Connector	Terminal	Ground	Voltage
1	F123	1	- Ground	
2	F124	1		
3	F125	1		
4	F126	1		Battery voltage
5	F127	1		battery voltage
6	F128	1		
7	F129	1		
8	F130	1		

Is the inspection result normal?

YES >> GO TO 3. NO >> GO TO 2.

2.DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F60, F121
- Harness connectors E10, F10
- IPDM E/R harness connector E7
- 10 A fuse (No. 44)
- · Harness for open or short between fuel injector and fuse

>> Repair open circuit, short to ground or short to power in harness or connectors.

$3. \mathsf{CHECK}$ FUEL INJECTOR OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check the continuity between fuel injector harness connector and ECM harness connector.

	Fuel injector		ECM		Continuity
Cylinder	Connector	Terminal	Connector	Terminal	Continuity
1	F123	2		25	
2	F124	2		21	
3	F125	2	F110 -	17	
4	F126	2		37	Existed
5	F127	2		41	Existed
6	F128	2		45	
7	F129	2		29	
8	F130	2		33	

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F60, F121
- Harness connectors F69, F122
- Harness for open or short between fuel injector and ECM

>> Repair open circuit, short to ground or short to power in harness or connectors.

FUEL INJECTOR

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

5. CHECK FUEL INJECTOR

Refer to EC-1098, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace malfunctioning fuel injector.

6. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace IPDM E/R.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

Component Inspection

INFOID:0000000003959020

1. CHECK FUEL INJECTOR

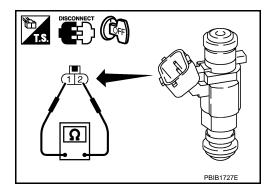
- 1. Turn ignition switch OFF.
- 2. Disconnect fuel injector harness connector.
- 3. Check resistance between fuel injector terminals as follows.

Terminals	Resistance	
1 and 2	11.1 - 14.3 Ω [at 10 - 60°C (50 - 140°F)]	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace malfunctioning fuel injector.



Α

EC

D

Е

Н

FUEL PUMP

Description INFOID:0000000003959021

The ECM activates the fuel pump for 1 second after the ignition switch is turned ON to improve engine startability. If the ECM receives a engine speed signal from the camshaft position sensor, it knows that the engine is rotating, and causes the pump to operate. If the engine speed signal is not received when the ignition switch is ON, the engine stalls. The ECM stops pump operation and prevents battery discharging, thereby improving safety. The ECM does not directly drive the fuel pump. It sends the control signal to the fuel pump control module, which in turn controls the fuel pump. Refer to EC-676, "System Description".

Condition	Fuel pump operation
Ignition switch is turned to ON.	Operates for 1 second.
Engine running and cranking	Operates.
When engine is stopped	Stops in 1.5 seconds.
Except as shown above	Stops.

Component Function Check

1. CHECK FUEL PUMP FUNCTION

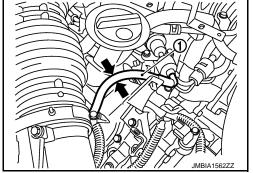
- Turn ignition switch ON.
- Pinch fuel feed hose (1) with two fingers.

Fuel pressure pulsation should be felt on the fuel feed hose for 1 second after ignition switch is turned ON.

Is the inspection result normal?

YES >> INSPECTION END

>> EC-1099, "Diagnosis Procedure". NO



Diagnosis Procedure

1. CHECK GROUND CONNECTION

Turn ignition switch OFF. Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection". 2.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK FPCM POWER SUPPLY CIRCUIT

- Turn ignition switch OFF.
- 2. Disconnect FPCM harness connector.
- Turn ignition switch ON.
- Check the voltage between FPCM harness connector and ground.

FP	FPCM				Voltage
Connector	Terminal	Giodila	Voltage		
B31	10	Ground	Battery voltage		

Is the inspection result normal?

>> GO TO 3.

YES >> GO TO 4.

3.DETECT MALFUNCTIONING PART

INFOID:0000000003959023

INFOID:0000000003959022

M

NO

< DTC/CIRCUIT DIAGNOSIS >

Check the following.

- Harness connectors B3, E121
- 15 A fuse (No.41)
- Harness for open or short between FPCM and IPDM E/R
 - >> Repair open circuit, short to ground or short to power in harness or connectors.

4. CHECK FPCM GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Check the continuity between FPCM harness connector and ground.

FPCM		Ground	Continuity	
Connector	Terminal	Ground	Continuity	
B31	5	Ground	Existed	

3. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit or short to power in harness or connectors.

5. CHECK FPCM INPUT AND OUTPUT CIRCUITS FOR OPEN AND SHORT

- 1. Disconnect ECM harness connector.
- 2. Check the continuity between FPCM harness connector and ECM harness connector.

FF	FPCM		ECM	
Connector	Terminal	Connector	Terminal	Continuity
B31	8	M160	125	Existed
531	9	IVITOO	112	LAISIEU

3. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B1, M7
- Harness for open or short between FPCM and ECM

>> Repair open circuit, short to ground or short to power in harness or connectors.

7. CHECK FUEL PUMP CONTROL CIRCUIT FOR OPEN AND SHORT

- 1. Disconnect "fuel level sensor unit and fuel pump (main)" harness connector.
- Check the continuity between FPCM harness connector and "fuel level sensor unit and fuel pump (main)" harness connector.

FPCM		Fuel level sensor unit and fuel pump (main)		Continuity
Connector	Terminal	Connector Terminal		Continuity
B31	6	B22	3	Existed
D 31	7	022	1	LAISIGU

3. Also check harness for short to ground and short to power.

<u>Is the inspection result normal?</u>

YES >> GO TO 8.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

FUEL PUMP

FUEL PUMP	
< DTC/CIRCUIT DIAGNOSIS > [VK50VE	<u>∃]</u>
8.CHECK FUEL PUMP	_
Refer to EC-1101, "Component Inspection".	A
Is the inspection result normal?	
YES >> GO TO 9. NO >> Replace fuel pump.	EC
9.CHECK FPCM	
Refer to EC-995, "Component Inspection".	_ C
Is the inspection result normal?	
YES >> GO TO 10. NO >> Replace FPCM.	D
NO >> Replace FPCM. 10.CHECK INTERMITTENT INCIDENT	
Refer to GI-35, "Intermittent Incident".	_E
Note: to <u>Grade, intermittent incluent.</u>	
>> INSPECTION END	_
Component Inspection	9024
1.CHECK FUEL PUMP	
Turn ignition switch OFF.	G
2. Disconnect "fuel level sensor unit and fuel pump (main)" harness connector.	
3. Check resistance between "fuel level sensor unit and fuel pump (main)" terminals as follows.	Н
Terminals Resistance	
1 and 3 0.2 - 5.0 Ω [at 25°C (77°F)]	
Is the inspection result normal?	
YES >> INSPECTION END NO >> Replace "fuel level sensor unit and fuel pump (main)"	J
NO >> Replace Tuel level sellsof utilit and fuel pump (main)	
	IZ.
	K
	L
	\mathbb{M}
	Ν
	0
	O

Р

ICC BRAKE SWITCH

Description INFOID:000000003959025

When the brake pedal is depressed, ICC brake switch is turned OFF and stop lamp switch is turned ON. ECM detects the state of the brake pedal by this input of two kinds (ON/OFF signal). Refer to CCS-24, "System Description" for the ICC function.

Component Function Check

INFOID:0000000003959026

1. CHECK ICC BRAKE SWITCH FUNCTION

- (II) With CONSULT-III
- 1. Turn ignition switch ON.
- Select "BRAKE SW1" in "DATA MONITOR" mode with CONSULT-III.
- Check "BRAKE SW1" indication under the following conditions.

Monitor item	Co	Indication	
BRAKE SW1	Brake pedal	Slightly depressed	OFF
(ICC brake switch)	Diake pedal	Fully released	ON

₩ Without CONSULT-III

- Turn ignition switch ON.
- 2. Check the voltage between ECM harness connector terminals as per the following.

ECM					
Connector	+	_	Condition		Voltage
Connector	Terminal	Terminal			
M160	117	128	Brake pedal	Slightly depressed	Approx. 0 V
101100	(ICC brake switch signal)	120	Diake pedai	Fully released	Battery voltage

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-1102, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003959027

1. CHECK DTC WITH ICC SENSOR INTEGRATED UNIT

Refer to CCS-44, "Diagnosis Description".

Are any DTCs detected?

YES >> Perform the Diagnosis Procedure corresponding to the detected DTC.

NO >> GO TO 2.

2.CHECK OVERALL FUNCTION

- (II) With CONSULT-III
- 1. Turn ignition switch ON.
- Select "BRAKE SW1" in "DATA MONITOR" mode with CONSULT-III.
- 3. Check "BRAKE SW1" indication under the following conditions.

Monitor item	Co	Indication	
BRAKE SW1	Brako podal	Slightly depressed	OFF
(ICC brake switch)	Brake pedal	Fully released	ON

Nithout CONSULT-III

- 1. Turn ignition switch ON.
- 2. Check the voltage between ECM harness connector terminals under the following conditions.

ECM					
Connector	+	_	Condition		Voltage (V)
Connector	Terminal	Terminal			
M160	117	128	Brake pedal Slightly depresse		Approx. 0
IVITOO	(ICC brake switch signal)	signal)		Fully released	Battery voltage

EC

D

Е

F

Ν

Α

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 3.

3.check icc brake switch power supply circuit-i

- 1. Turn ignition switch OFF.
- 2. Disconnect ICC brake switch harness connector.
- 3. Turn ignition switch ON.
- 4. Check the voltage between ICC brake switch harness connector and ground.

ICC brake switch		Ground	Voltage
Connector	Connector Terminal		voltage
E114	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 10.

NO >> GO TO 4.

4. CHECK ICC BRAKE SWITCH POWER SUPPLY CIRCUIT-II

- 1. Turn ignition switch OFF.
- Disconnect ICC brake hold relay.
- 3. Turn ignition switch ON.
- 4. Check the voltage between ICC brake hold relay harness connector and ground.

ICC brake hold relay		Ground	Voltage	
Connector	Connector Terminal		voltage	
E91	3	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 5.

DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E103
- 10 A fuse (No. 3)
- · Harness for open or short between ICC brake hold relay and fuse

>> Repair open circuit or short to ground in harness or connectors.

6. CHECK ICC BRAKE SWITCH POWER SUPPLY CIRCUIT-III

- Turn ignition switch OFF.
- 2. Check the continuity between ICC brake switch harness connector and ICC brake hold relay harness connector.

ICC brake switch		ICC brake hold relay		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E114	1	E91	4	Existed

Also check harness for short to ground and short to power.

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

7.CHECK ICC BRAKE HOLD RELAY CONTROL CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- 2. Disconnect brake booster control unit harness connector.
- Check the continuity between ICC brake hold relay harness connector and brake booster control unit harness connector.

ICC brake hold relay		Brake booster control unit		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E91	1	B249	47	Existed

4. Check the continuity between ICC brake hold relay harness connector and ground.

ICC brake	hold relay	Ground	Continuity
Connector	Connector Terminal		Continuity
E91	2	Ground	Existed

5. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 9.

NO >> GO TO 8.

8. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E106, M6
- Harness connectors M117, B201
- · Harness for open or short between ICC brake hold relay and brake booster control unit
- Harness for open or short between ICC brake hold relay and ground

>> Repair open circuit, short to ground or short to power in harness or connectors.

9. CHECK ICC BRAKE HOLD RELAY

Refer to EC-1105, "Component Inspection (ICC Brake Hold Relay)".

Is the inspection result normal?

YES >> GO TO 13.

NO >> Replace ICC brake hold relay.

10. CHECK ICC BRAKE SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check the continuity between ICC brake switch harness connector and ECM harness connector.

ICC brake switch		ECM		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E114	2	M160	117	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 12. NO >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check the following.

• Harness connectors E106, M6

ICC BRAKE SWITCH

[VK50VE] < DTC/CIRCUIT DIAGNOSIS > · Harness for open or short between ICC brake switch and ECM

>> Repair open circuit, short to ground or short to power in harness or connectors.

12. CHECK ICC BRAKE SWITCH

Refer to EC-1050, "Component Inspection (ICC Brake Switch)".

Is the inspection result normal?

YES >> GO TO 13.

NO >> Replace ICC brake switch.

13. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection (ICC Brake Switch)

1. CHECK ICC BRAKE SWITCH-I

- Turn ignition switch OFF.
- Disconnect ICC brake switch harness connector. 2.
- Check the continuity between ICC brake switch terminals under the following conditions.

Terminals	(Continuity	
1 and 2	1 and 2 Brake pedal Fully released		Existed
1 and 2	ranu z Brake pedar	Slightly depressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.CHECK ICC BRAKE SWITCH-II

- Adjust ICC brake switch installation. Refer to BR-7, "Inspection and Adjustment".
- Check the continuity between ICC brake switch terminals under the following conditions.

Terminals	Condition		Continuity
1 and 2 Brake	Brake pedal	Fully released	Existed
1 4114 2	Бтакс ресса	Slightly depressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace ICC brake switch.

Component Inspection (ICC Brake Hold Relay)

1. CHECK ICC BRAKE HOLD RELAY

- Turn ignition switch OFF.
- Remove ICC brake hold relay.

EC-1105 Revision: 2009 March 2009 FX35/FX50

EC

Α

Е

INFOID:0000000004032268

F

Н

M

INFOID:0000000003958970 Ν

Р

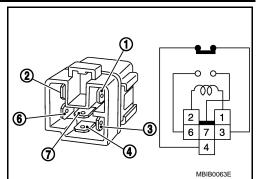
ICC BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

3. Check the continuity between ICC brake hold relay terminals under the following conditions.

Terminals	Condition	Continuity
3 and 4	Not existed	
J and 4	No current supply	Existed
6 and 7	12 V direct current supply between terminals 1 and 2	Existed
o and 7	No current supply	Not existed



Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace ICC brake hold relay

IGNITION SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

INFOID:0000000003959030

IGNITION SIGNAL

Description INFOID:0000000003959029

The ignition signal from the ECM is sent to and amplified by the power transistor. The power transistor turns ON and OFF the ignition coil primary circuit. This ON/OFF operation induces the proper high voltage in the coil secondary circuit.

EC

Α

Component Function Check

1.INSPECTION START

Turn ignition switch OFF, and restart engine.

Does the engine start?

YES-1 >> With CONSULT-III: GO TO 2.

YES-2 >> Without CONSULT-III: GO TO 3.

>> Go to EC-1107, "Diagnosis Procedure".

2.CHECK IGNITION SIGNAL FUNCTION

(P) With CONSULT-III

- Perform "POWER BALANCE" in "ACTIVE TEST" mode with CONSULT-III.
- Check that each circuit produces a momentary engine speed drop.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-1107, "Diagnosis Procedure".

3.check ignition signal function

₩ Without CONSULT-III

Let engine idle.

Read the voltage signal between ECM harness connector terminals under the following conditions with an oscilloscope.

ECM						
Cylinder		+	_		Voltage signal	
Cyllilaei	Connector	Terminal	Connector	Terminal		
1		10				
2		9	M160	128		
3		13				
4	F110	14				
5	FIIU	18		IVITOU	120	
6		22			>> 2.0V/Div 50 ms/Div	
7	•	26			PBIB0044E	
8	•	30				

NOTE:

The pulse cycle changes depending on rpm at idle.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-1107, "Diagnosis Procedure".

Diagnosis Procedure

Revision: 2009 March

1. CHECK IGNITION COIL POWER SUPPLY CIRCUIT-I

- Turn ignition switch OFF, wait at least 10 seconds and then turn it ON.
- Check the voltage between ECM harness connector terminals under the following conditions.

D

Е

N

INFOID:0000000003959031

2009 FX35/FX50

Connector	+	_	Voltage
Connector	Terminal	Terminal	
M160	121	128	Battery voltage

Is the inspection result normal?

YES >> GO TO 2.

NO >> Go to EC-739, "Diagnosis Procedure".

2.CHECK IGNITION COIL POWER SUPPLY CIRCUIT-II

- Turn ignition switch OFF.
- 2. Disconnect condenser harness connector.
- 3. Turn ignition switch ON.
- 4. Check the voltage between condenser harness connector and ground.

Cond	lenser	Ground	Voltage	
Connector	Terminal	Ground		
F8	1	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 3.

3.check ignition coil power supply circuit-iii

- Turn ignition switch OFF.
- 2. Disconnect IPDM E/R harness connector E7.
- 3. Check the continuity between IPDM E/R harness connector and condenser harness connector.

IPDM	E/R	Cond	enser	Continuity
Connector	Terminal	Connector Terminal		Continuity
E7	49	F8	1	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> Go to EC-739, "Diagnosis Procedure".

NO >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E10, F10
- Harness for open or short between IPDM E/R and condenser

>> Repair open circuit, short to ground or short to power in harness or connectors.

5. CHECK CONDENSER GROUND CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- Check the continuity between condenser harness connector and ground.

Cond	enser	Ground	Continuity	
Connector	Terminal	Oround	Continuity	
F8	2	Ground	Existed	

3. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair open circuit or short to power in harness or connectors.

IGNITION SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

6. CHECK CONDENSER

Refer to EC-1111, "Component Inspection (Condenser)"

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace condenser.

7.CHECK IGNITION COIL POWER SUPPLY CIRCUIT-IV

- Reconnect all harness connectors disconnected.
- Disconnect ignition coil harness connector.
- 3. Turn ignition switch ON.
- 4. Check the voltage between ignition coil harness connector and ground.

	Ignition coil			Voltage
Cylinder	Connector	Terminal	Ground	voltage
1	F75	3		
2	F76	3		Battery voltage
3	F77	3	Ground	
4	F78	3		
5	F79	3	Giodila	
6	F80	3		
7	F81	3		
8	F82	3	1	

Is the inspection result normal?

YES >> GO TO 9.

NO >> GO TO 8.

8.DETECT MALFUNCTIONING PART

Check the following.

- Harness connector F10
- Harness for open or short between ignition coil and harness connector F10

>> Repair or replace harness or connectors.

9. CHECK IGNITION COIL GROUND CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- 2. Check the continuity between ignition coil harness connector and ground.

Ignition coil			Ground	Continuity
Cylinder	Connector	Terminal	Giodila	Continuity
1	F75	2		
2	F76	2		Existed
3	F77	2		
4	F78	2	Ground	
5	F79	2	Giodila	
6	F80	2		
7	F81	2		
8	F82	2		

^{3.} Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 10.

Revision: 2009 March

EC-1109

2009 FX35/FX50

EC

D

Е

K

Ν

NO >> Repair open circuit or short to power in harness or connectors.

10.check ignition coil output signal circuit for open and short

- 1. Disconnect ECM harness connector.
- 2. Check the continuity between ignition coil harness connector and ECM harness connector.

Ignition coil			EC	Continuity	
Cylinder	Connector	Terminal	Connector	Terminal	Continuity
1	F75	1		10	
2	F76	1		9	
3	F77	1		13	
4	F78	1	F110	14	Existed
5	F79	1	1 110	18	LXISIGU
6	F80	1		22	
7	F81	1		28	
8	F82	1		30	

3. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

11. CHECK IGNITION COIL WITH POWER TRANSISTOR

Refer to EC-1110, "Component Inspection (Ignition Coil with Power Transistor)".

Is the inspection result normal?

YES >> GO TO 12.

NO >> Replace malfunctioning ignition coil with power transistor.

12. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection (Ignition Coil with Power Transistor)

INFOID:0000000003959032

1. CHECK IGNITION COIL WITH POWER TRANSISTOR-I

- Turn ignition switch OFF.
- 2. Disconnect ignition coil harness connector.
- 3. Check resistance between ignition coil terminals as per the following.

Terminals	Resistance [at 25°C (77°F)]		
1 and 2	Except 0 or $\infty \Omega$		
1 and 3	Except 0 Ω		
2 and 3			

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace malfunctioning ignition coil with power transistor.

2.CHECK IGNITION COIL WITH POWER TRANSISTOR-II

CAUTION

Perform the following procedure in a place with no combustible objects and good ventilation.

- Turn ignition switch OFF.
- 2. Reconnect all harness connectors disconnected.

0

0

JMBIA1552ZZ

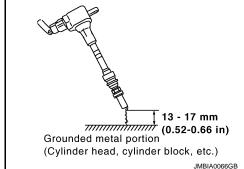
< DTC/CIRCUIT DIAGNOSIS >

Remove fuel pump fuse (1) in IPDM E/R (2) to release fuel pressure.

NOTE:

Do not use CONSULT-III to release fuel pressure, or fuel pressure applies again during the following procedure.

- 4. Start engine.
- 5. After engine stalls, crank it 2 or 3 times to release all fuel pres-
- Turn ignition switch OFF.
- 7. Remove all ignition coil harness connectors to avoid the electrical discharge from the ignition coils.
- 8. Remove ignition coil and spark plug of the cylinder to be checked.
- 9. Crank engine for 5 seconds or more to remove combustion gas in the cylinder.
- 10. Connect spark plug and harness connector to ignition coil.
- 11. Fix ignition coil using a rope etc. with gap of 13 17 mm (0.52 -0.66 in) between the edge of the spark plug and grounded metal portion as shown in the figure.
- 12. Crank engine for approximately 3 seconds, and check whether spark is generated between the spark plug and the grounded metal portion.



Spark should be generated.

- Never place the spark plug and the ignition coil within 50 cm (19.7 in) each other. Be careful not to get an electrical shock while checking, because the electrical discharge voltage becomes 20 kV or more.
- It might damage the ignition coil if the gap of more than 17 mm (0.66 in) is made.

When the gap is less than 13 mm (0.52 in), a spark might be generated even if the coil is malfunctioning.

Is the inspection result normal?

>> INSPECTION END YES

NO >> Replace malfunctioning ignition coil with power transistor.

Component Inspection (Condenser)

1. CHECK CONDENSER

- Turn ignition switch OFF.
- Disconnect condenser harness connector.
- Check resistance between condenser terminals as per the following.

Terminals	Resistance
1 and 2	Above 1 MΩ [at 25°C (77°F)]

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace condenser.

EC

Α

Е

D

F

K

INFOID:0000000003959033

Р

N

INFORMATION DISPLAY (ASCD)

Description INFOID:000000004072222

The operation mode of the ASCD is indicated on the information display in the combination meter. When turning ON the MAIN switch of the ASCD steering switch, the CRUISE lamp turns ON, CRUISE is indicated on the information display and the operation mode turns to standby mode. When turning ON the SET/COAST switch while the vehicle is driven at the ASCD setting condition speed range, the SET lamp turns ON and the set speed is indicated on the information display. When the canceling conditions come into effect, CANCEL is indicated on the information display.

Component Function Check

INFOID:0000000004072223

1. CHECK INFORMATION DISPLAY

- 1. Start engine.
- Press MAIN switch on ASCD steering switch.
- Drive the vehicle at more than 40 km/h (25 MPH).

CAUTION:

Always drive vehicle at a safe speed.

- 4. Press SET/COAST switch.
- Check that the reading of the speedometer shows the same value as the set speed indicated in the information display while driving the vehicle on a flat road.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-1112, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000004072224

1.CHECK DTC

Check that DTC UXXXX, P0500 or P1574 is not displayed.

Is the inspection result normal?

YES >> GO TO 2.

NO-1 >> Perform trouble diagnosis for DTC UXXXX.

NO-2 >> Perform trouble diagnosis for DTC P0500. Refer to EC-942, "DTC Logic".

NO-3 >> Perform trouble diagnosis for DTC P1574. Refer to <u>EC-1052, "DTC Logic"</u> (Without ICC) or <u>EC-1054, "DTC Logic"</u> (With ICC).

2.CHECK DTC WITH "UNIFIED METER & A/C AMP."

Refer to MWI-45, "CONSULT-III Function (METER/M&A)".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Perform trouble diagnosis for DTC indicated.

3.check intermittent incident

Refer to GI-35, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace combination meter.

NO >> Repair or replace.

INFOID:0000000003959034

MALFUNCTION INDICATOR LAMP

Description

The Malfunction Indicator Lamp (MIL) is located on the combination

The MIL will illuminate when the ignition switch is turned ON without the engine running. This is a bulb check.

When the engine is started, the MIL should turn off. If the MIL remains illuminated, the on board diagnostic system has detected an engine system malfunction.

For details, refer to EC-706, "Diagnosis Description".



Component Function Check

1. CHECK MIL FUNCTION

- Turn ignition switch ON.
- Check that MIL illuminates.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-1113, "Diagnosis Procedure".

Diagnosis Procedure

1. CHECK DTC

Check that DTC UXXXX is not displayed.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Perform trouble diagnosis for DTC UXXXX.

2.CHECK DTC WITH "UNIFIED METER AND A/C AMP."

Refer to MWI-45, "CONSULT-III Function (METER/M&A)".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Perform trouble diagnosis for DTC indicated.

3.check intermittent incident

Refer to GI-35, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace combination meter.

NO >> Repair or replace malfunctioning part. EC

Α

EC-1113 Revision: 2009 March 2009 FX35/FX50

D

Е

INFOID:0000000003959035

F

Н

INFOID:0000000003959036

L

Ν

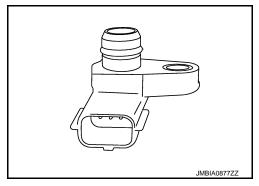
Р

MANIFOLD PRESSURE SENSOR

Description INFOID:000000004026036

The manifold pressure sensor is placed at intake manifold collector. It detects intake manifold pressure and sends the voltage signal to the ECM.

The sensor uses a silicon diaphragm which is sensitive to the change in pressure. As the pressure increases, the voltage rises. This sensor is not for controlling the engine system, nor for the on board diagnosis.



Component Function Check

INFOID:0000000004026039

1. CHECK MANIFOLD PRESSURE SENSOR FUNCTION

- 1. Start engine and warm it up to normal operating temperature.
- 2. Check the voltage between ECM harness connector terminals as per the following.

Connector	+	_	Voltage (V)	
	Terminal	Terminal		
F111	69 (Manifold pressure sensor signal)	70	0.6 - 4.8	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-1114, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000004026037

1. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- 2. Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK MANIFOLD PRESSURE SENSOR POWER SUPPLY CIRCUIT FOR OPEN AND SHORT

- Disconnect manifold pressure sensor harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between manifold pressure sensor harness connector and ground.

Manifold pre	ssure sensor	Ground	Voltage	
Connector	Terminal	Ground	voltage	
F65	1	Ground	Approx. 5V	

4. Also check harness for short to ground and power.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK MANIFOLD PRESSURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.

MANIFOLD PRESSURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

Disconnect ECM harness connector.

Check the continuity between manifold pressure sensor harness connector and ECM harness connector.

Manifold pressure sensor		ECM		Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
F65	3	F111	70	Existed	

4. Also check harness for short to ground and power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

f 4.CHECK MANIFOLD PRESSURE SENSOR INTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

Check the continuity between manifold pressure sensor harness connector and ECM harness connector.

Manifold pressure sensor		ECM		Continuity	
Connector	Terminal	Connector			
F65	2	F111	69	Existed	

Also check harness for short to ground and power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

5.CHECK MANIFOLD PRESSURE SENSOR

Refer to EC-1115, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace manifold pressure sensor.

6.CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:00000000004026038

1. CHECK MANIFOLD PRESSURE SENSOR

Turn ignition switch OFF.

- 2. Reconnect all harness connectors disconnected.
- Start engine and warm it up to normal operating temperature.
- Check the voltage between ECM harness connector terminals under the following conditions.

ECM						
Connector	+	_	Condition		Voltage (V)	
Connector	Terminal	Terminal				
F111	69	70	Engine speed	Idle	Approx. 1.2	
	(Manifold pressure sensor)	(Sensor ground)		2,000 rpm	Approx. 1.5	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace manifold pressure sensor.

EC-1115 Revision: 2009 March 2009 FX35/FX50

EC

D

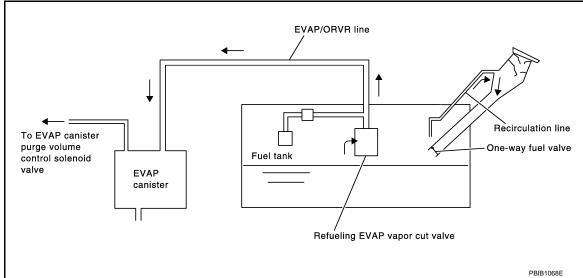
Е

Н

N

ON BOARD REFUELING VAPOR RECOVERY (ORVR)

Description INFOID:000000003959037



From the beginning of refueling, the air and vapor inside the fuel tank go through refueling EVAP vapor cut valve and EVAP/ORVR line to the EVAP canister. The vapor is absorbed by the EVAP canister and the air is released to the atmosphere.

When the refueling has reached the full level of the fuel tank, the refueling EVAP vapor cut valve is closed and refueling is stopped because of auto shut-off. The vapor which was absorbed by the EVAP canister is purged during driving.

WARNING:

When conducting inspections below, be sure to observe the following:

- Put a "CAUTION: FLAMMABLE" sign in workshop.
- Never smoke while servicing fuel system. Keep open flames and sparks away from work area.
- Always furnish the workshop with a CO₂ fire extinguisher.

CAUTION:

- Before removing fuel line parts, carry out the following procedures:
- Put drained fuel in an explosion-proof container and put lid on securely.
- Release fuel pressure from fuel line. Refer to EC-1228, "Inspection".
- Disconnect battery ground cable.
- Always replace O-ring when the fuel gauge retainer is removed.
- Never kink or twist hose and tube when they are installed.
- Never tighten hose and clamps excessively to avoid damaging hoses.
- · After installation, run engine and check for fuel leaks at connections.
- Never attempt to top off the fuel tank after the fuel pump nozzle shuts off automatically.
 Continued refueling may cause fuel overflow, resulting in fuel spray and possibly a fire.

Component Function Check

INFOID:0000000003959038

1. CHECK ORVR FUNCTION

Check whether the following symptoms are present.

- Fuel odor from EVAP canister is strong.
- Cannot refuel/Fuel odor from the fuel filler opening is strong while refueling.

Are any symptoms present?

YES >> Go to EC-1116, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003959039

1.INSPECTION START

Check whether the following symptoms are present.

A: Fuel odor from EVAP canister is strong.

ON BOARD REFUELING VAPOR RECOVERY (ORVR)

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

B: Cannot refuel/Fuel odor from the fuel filler opening is strong while refueling.

Which symptom is present?

- >> GO TO 2. Α
- >> GO TO 7. В

2. CHECK EVAP CANISTER

- Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
- 2. Weigh the EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.

The weight should be less than 2.1 kg (4.6 lb).

Is the inspection result normal?

>> GO TO 3. YES NO >> GO TO 4.

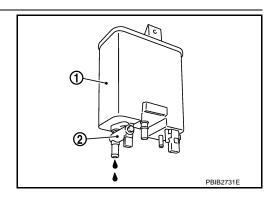
3.CHECK IF EVAP CANISTER IS SATURATED WITH WATER

Check if water will drain from EVAP canister (1).

EVAP canister vent control valve (2)

Does water drain from the EVAP canister?

YES >> GO TO 4. NO >> GO TO 6.



4. REPLACE EVAP CANISTER

Replace EVAP canister with a new one.

>> GO TO 5.

5.DETECT MALFUNCTIONING PART

Check the EVAP hose between EVAP canister and vehicle frame for clogging or poor connection.

>> Repair or replace EVAP hose.

6.CHECK REFUELING EVAP VAPOR CUT VALVE

Refer to EC-1119, "Component Inspection".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace refueling EVAP vapor cut valve with fuel tank.

7. CHECK EVAP CANISTER

- Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
- 2. Weigh the EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.

The weight should be less than 2.1 kg (4.6 lb).

Is the inspection result normal?

YES >> GO TO 8. NO >> GO TO 9.

8.CHECK IF EVAP CANISTER IS SATURATED WITH WATER

EC

Α

D

Е

F

Н

N

Р

ON BOARD REFUELING VAPOR RECOVERY (ORVR)

< DTC/CIRCUIT DIAGNOSIS >

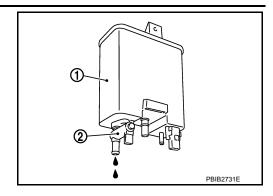
[VK50VE]

Check if water will drain from EVAP canister (1).

• EVAP canister vent control valve (2)

Does water drain from the EVAP canister?

YES >> GO TO 9. NO >> GO TO 11.



9. REPLACE EVAP CANISTER

Replace EVAP canister with a new one.

>> GO TO 10.

10. DETECT MALFUNCTIONING PART

Check the EVAP hose between EVAP canister and vehicle frame for clogging or poor connection.

>> Repair or replace EVAP hose.

11. CHECK VENT HOSES AND VENT TUBES

Check hoses and tubes between EVAP canister and refueling control valve for clogging, kinks, looseness and improper connection.

Is the inspection result normal?

YES >> GO TO 12.

NO >> Repair or replace hoses and tubes.

12. CHECK FILLER NECK TUBE

Check recirculation line for clogging, dents and cracks.

Is the inspection result normal?

YES >> GO TO 13.

NO >> Replace filler neck tube.

13. CHECK REFUELING EVAP VAPOR CUT VALVE

Refer to EC-1119, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 14.

NO >> Replace refueling EVAP vapor cut valve with fuel tank.

14. CHECK FUEL FILLER TUBE

Check filler neck tube and hose connected to the fuel tank for clogging, dents and cracks.

Is the inspection result normal?

YES >> GO TO 15.

NO >> Replace fuel filler tube.

15. CHECK ONE-WAY FUEL VALVE-I

Check one-way valve for clogging.

Is the inspection result normal?

YES >> GO TO 16.

NO >> Repair or replace one-way fuel valve with fuel tank.

16. CHECK ONE-WAY FUEL VALVE-II

- 1. Check that fuel is drained from the tank.
- 2. Remove fuel filler tube and hose.

ON BOARD REFUELING VAPOR RECOVERY (ORVR)

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

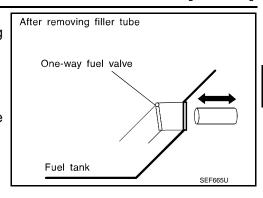
Check one-way fuel valve for operation as per the following.
 When a stick is inserted, the valve should open, when removing stick it should close.

Do not drop any material into the tank.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace fuel filler tube or replace one-way fuel valve with fuel tank.



INFOID:0000000003959040

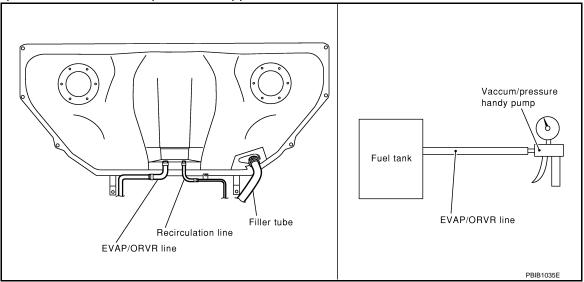
Component Inspection

1. CHECK REFUELING EVAP VAPOR CUT VALVE

- Turn ignition switch OFF.
- 2. Remove fuel tank. Refer to FL-10, "Removal and Installation".
- 3. Drain fuel from the tank as per the following:
- Remove fuel gauge retainer.
- Drain fuel from the tank using a handy pump into a fuel container.
- 4. Check refueling EVAP vapor cut valve for being stuck to close as per the following. Blow air into the refueling EVAP vapor cut valve (from the end of EVAP/ORVR line hose), and check that the air flows freely into the tank.
- 5. Check refueling EVAP vapor cut valve for being stuck to open as per the following.
- Connect vacuum pump to hose end.
- Remove fuel gauge retainer with fuel gauge unit.

Always replace O-ring with new one.

- Turn fuel tank upside down.
- Apply vacuum pressure to hose end [-13.3 kPa (-0.136 kg/cm³, -1.93 psi)] with fuel gauge retainer remaining open and check that the pressure is applicable.



Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace refueling EVAP vapor cut valve with fuel tank.

EC

Α

С

D

F

Н

0

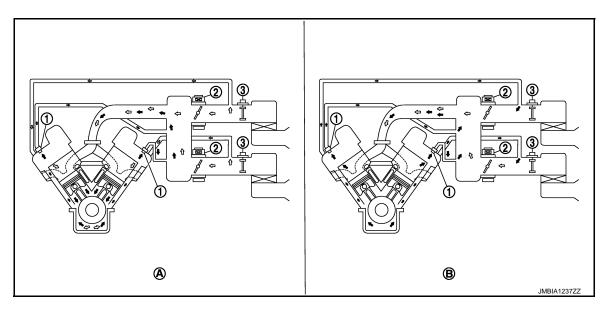
Ν

Ρ

Revision: 2009 March **EC-1119** 2009 FX35/FX50

POSITIVE CRANKCASE VENTILATION

Description INFOID:000000003959041



- 1. PCV valve
- A. Normal condition
- Elow-by air

- 2. Electric throttle control actuator
- B. Hi-load condition
- Mass air flow sensor

This system returns blow-by gas to the intake manifold.

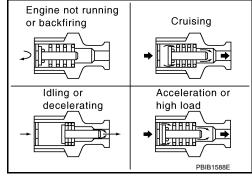
The positive crankcase ventilation (PCV) valve is provided to conduct crankcase blow-by gas to the intake manifold.

During partial throttle operation of the engine, the intake manifold sucks the blow-by gas through the PCV valve.

Normally, the capacity of the valve is sufficient to handle any blow-by and a small amount of ventilating air. The ventilating air is drawn from the air inlet tubes into the crankcase. In this process the air passes through the hose connecting air inlet tubes to rocker cover.

Under full-throttle condition, the manifold vacuum is insufficient to draw the blow-by flow through the valve. The flow goes through the hose connection in the reverse direction.

On vehicles with an excessively high blow-by, the valve does not meet the requirement. This is because some of the flow will go through the hose connection to the air inlet tubes under all conditions.



Component Inspection

1. CHECK PCV VALVE

INFOID:0000000003959042

POSITIVE CRANKCASE VENTILATION

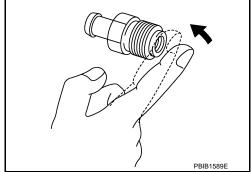
< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

With engine running at idle, remove PCV valve from rocker cover. A properly working valve makes a hissing noise as air passes through it. A strong vacuum should be felt immediately when a finger is placed over valve inlet.

Is the inspection result normal?

YES >> INSPECTION END NO >> Replace PCV valve.



EC

Α

С

D

Е

F

G

Н

.

Κ

L

M

Ν

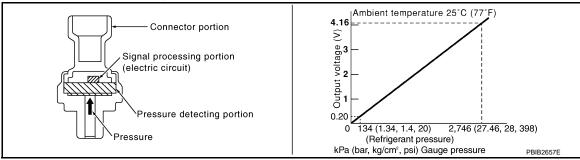
0

Р

REFRIGERANT PRESSURE SENSOR

Description INFOID:000000003959043

The refrigerant pressure sensor is installed at the condenser of the air conditioner system. The sensor uses an electrostatic volume pressure transducer to convert refrigerant pressure to voltage. The voltage signal is sent to ECM, and ECM controls cooling fan system.



Component Function Check

INFOID:0000000003959044

1. CHECK REFRIGERANT PRESSURE SENSOR FUNCTION

- 1. Start engine and warm it up to normal operating temperature.
- 2. Turn A/C switch and blower fan switch ON.
- Check the voltage between ECM harness connector terminals as per the following.

Connector	+	_	Voltage (V)
Connector	Terminal	Terminal	
F111	90 (Refrigerant pressure sensor signal)	66	1.0 - 4.0

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-1122, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003959045

1. CHECK GROUND CONNECTION

- Turn A/C switch and blower fan switch OFF.
- 2. Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ground connection.

2.CHECK REFRIGERANT PRESSURE SENSOR POWER SUPPLY CIRCUIT

- Disconnect refrigerant pressure sensor harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between refrigerant pressure sensor harness connector and ground.

Refrigerant pr	essure sensor	Ground	Voltage (V)	
Connector Terminal		Orodria	voltage (v)	
E77	3	Ground	Approx. 5	

Is the inspection result normal?

YES >> GO TO 4. NO >> GO TO 3.

REFRIGERANT PRESSURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

3.DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F10, E10
- Harness for open or short between ECM and refrigerant pressure sensor

EC

>> Repair open circuit, short to ground or short to power in harness or connectors.

f 4.CHECK REFRIGERANT PRESSURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check the continuity between refrigerant pressure sensor harness connector and ECM harness connec-

Refrigerant pre	essure sensor	EC	Continuity	
Connector Terminal		Connector	Terminal	Continuity
E77	1	F111	66	Existed

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 6. NO >> GO TO 5.

DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F10, E10
- Harness for open or short between ECM and refrigerant pressure sensor

>> Repair open circuit, short to ground or short to power in harness or connectors.

6.CHECK REFRIGERANT PRESSURE SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

Check the continuity between refrigerant pressure sensor harness connector and ECM harness connector.

Refrigerant pre	essure sensor	EC	CM	Continuity
Connector Terminal		Connector	Terminal	Continuity
E77	2	F111	90	Existed

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 8. NO >> GO TO 7.

.DETECT MALFUNCTIONING PART

Check the following.

Revision: 2009 March

- Harness connectors F10, E10
- Harness for open or short between ECM and refrigerant pressure sensor

>> Repair open circuit, short to ground or short to power in harness or connectors.

8. CHECK INTERMITTENT INCIDENT

Refer to GI-35. "Intermittent Incident".

Is the inspection result normal?

YES >> Replace refrigerant pressure sensor.

>> Repair or replace malfunctioning part. NO

EC-1123

Е

Ν

2009 FX35/FX50

SNOW MODE SWITCH

Description INFOID:000000003959046

The snow mode switch signal is sent to the "unified meter and A/C amp." from the snow mode switch. The "unified meter and A/C amp." then sends the signal to the ECM via the CAN communication line.

The snow mode is used for driving or starting the vehicle on snowy roads or slippery areas. If the snow mode is activated, the vehicle speed will not accelerate as quickly as normal to avoid vehicle slip. In other words, ECM controls rapid engine torque change by controlling the electric throttle control actuator operating speed.

Component Function Check

INFOID:0000000003959047

1. CHECK SNOW MODE SWITCH FUNCTION

NOTE:

If DTC UXXXX are displayed, first perform the trouble diagnosis for DTC UXXXX.

- 1. Turn ignition switch ON.
- 2. Select "SNOW MODE SW" in "DATA MONITOR" mode with CONSULT-III.
- 3. Check "SNOW MODE SW" indication under the following conditions.

Monitor item	Condition		Indication
SNOW MODE SW	Snow mode switch	ON	ON
SNOW MODE SW	Show mode switch	OFF	OFF

Is the inspection result normal?

YES >> GO TO 2.

NO >> Go to EC-1124, "Diagnosis Procedure".

2.check snow mode indicator function

- 1. Turn ignition switch ON.
- 2. Check the snow mode indicator in the snow mode switch under the following condition.

Condition		Snow mode indicator
Snow mode switch	ON	ON
Show mode switch	OFF	OFF

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-1124, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003959048

1. CHECK SNOW MODE SWITCH OVERALL FUNCTION-I

Confirm the malfunctioning circuit (snow mode switch or snow mode indicator). Refer to <u>EC-1124, "Component Function Check"</u>.

Which circuit is related to the incident?

Snow mode switch>>GO TO 2.

Snow mode indicator>>GO TO 6.

2.CHECK DTC WITH "UNIFIED METER AND A/C AMP."

Refer to MWI-45, "CONSULT-III Function (METER/M&A)".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Go to MWI-4, "Work flow".

3. CHECK SNOW MODE SWITCH POWER SUPPLY CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect snow mode switch harness connector.

SNOW MODE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

- Turn ignition switch ON.
- Check the voltage between snow mode switch harness connector and ground.

Snow mo	ode switch	Ground	Voltage	
Connector Terminal		Ground	voltage	
M176	1	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 5. NO >> GO TO 4.

4.DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E106, M6
- IPDM E/R harness connector E7
- 10 A fuse (No. 43)
- Harness for open or short between snow mode switch and fuse.

>> Repair open circuit, short to ground or short to power in harness or connectors.

${f 5}.$ CHECK SNOW MODE SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect "unified meter and A/C amp." harness connector.
- 3. Check the continuity between snow mode switch harness connector and "unified meter and A/C amp." harness connector.

Snow mode switch		Unified meter	Continuity	
Connector	Terminal	Connector Terminal		Continuity
M176	4	M66	23	Existed

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

6.CHECK GROUND CONNECTION

- Turn ignition switch OFF.
- Check ground connection M95. Refer to Ground Inspection in GI-38, "Circuit Inspection".

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace ground connection.

7.CHECK SNOW MODE INDICATOR LAMP GROUND CIRCUIT FOR OPEN AND SHORT

Check the continuity between snow mode switch harness connector and ground.

Snow mod	de switch	Ground	Continuity	
Connector Terminal		Giodila	Continuity	
M176	2	Ground	Existed	

Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair open circuit or short to power in harness or connectors.

8. CHECK SNOW MODE SWITCH

Refer to EC-1126, "Component Inspection".

Is the inspection result normal?

EC-1125 Revision: 2009 March 2009 FX35/FX50

EC

Α

[VK50VE]

D

Е

Н

N

SNOW MODE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VK50VE]

YES >> GO TO 9.

NO >> Replace snow mode switch.

9. CHECK INTERMITTENT INCIDENT

Refer to GI-35, "Intermittent Incident".

>> INSPECTION END

Component Inspection

INFOID:0000000003959049

1. CHECK SNOW MODE SWITCH-I

- 1. Turn ignition switch OFF.
- 2. Disconnect snow mode switch harness connector.
- 3. Check the continuity between snow mode switch terminals under the following conditions.

Terminals	Condition		Continuity
1 and 4	Snow mode switch	ON	Existed
1 4110 4	Show mode switch	OFF	Not Existed

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace snow mode switch.

2. CHECK SNOW MODE SWITCH-II

Check the continuity between snow mode switch terminals under the following conditions.

Terminals (Polarity)	Continuity
2 (+) - 4 (-)	Existed
4 (+) - 2 (–)	Not Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace snow mode switch.

Α

C

D

Е

F

Н

K

L

M

Ν

Р

ECU DIAGNOSIS INFORMATION

ECM

Reference Value INFOID:0000000003959050

EC

VALUES ON THE DIAGNOSIS TOOL

NOTE:

- Specification data are reference values.
- Specification data are output/input values which are detected or supplied by the ECM at the connector.
- * Specification data may not be directly related to their components signals/values/operations. i.e. Adjust ignition timing with a timing light before monitoring IGN TIMING, because the monitor may show the specification data in spite of the ignition timing not being adjusted to the specification data. This IGN TIM-ING monitors the data calculated by the ECM according to the signals input from the camshaft position sen-

sor and other ignition timing related sensors.

Monitor Item		Condition	Values/Status
ENG SPEED	Run engine and compare CONSI	ULT-III value with the tachometer indication.	Almost the same speed as the tachometer indication
MAS A/F SE-B1	See EC-731, "Description".		
MAS A/F SE-B2	See EC-731, "Description".		
B/FUEL SCHDL	See EC-731, "Description".		
A/F ALPHA-B1	See EC-731, "Description".		
A/F ALPHA-B2	See EC-731, "Description".		
COOLAN TEMP/S	Ignition switch: ON		Indicates engine coolant temperature
A/F SEN1 (B1)	Engine: After warming up	Maintaining engine speed at 2,000 rpm	Fluctuates around 2.2 V
A/F SEN1 (B2)	Engine: After warming up	Maintaining engine speed at 2,000 rpm	Fluctuates around 2.2 V
HO2S2 (B1)	 Revving engine from idle up to 3 tions are met. Engine: After warming up After keeping engine speed betwat idle for 1 minute under no load 	0 - 0.3 V ←→ Approx. 0.6 - 1.0 V	
HO2S2 (B2)	 Revving engine from idle up to 3 tions are met. Engine: After warming up After keeping engine speed betwat idle for 1 minute under no load 	0 - 0.3 V ←→ Approx. 0.6 - 1.0 V	
HO2S2 MNTR (B1)	 Revving engine from idle up to 3 tions are met. Engine: After warming up After keeping engine speed betwat idle for 1 minute under no load 	$LEAN \longleftrightarrow RICH$	
HO2S2 MNTR (B2)	 Revving engine from idle up to 3 tions are met. Engine: After warming up After keeping engine speed betwat idle for 1 minute under no load 	$LEAN \longleftrightarrow RICH$	
VHCL SPEED SE	Turn drive wheels and compare C dication.	CONSULT-III value with the speedometer in-	Almost the same speed as speedometer indication
BATTERY VOLT	Ignition switch: ON (Engine stop)	ped)	11 - 14 V
ACCEL CENTA	Ignition switch: ON	Accelerator pedal: Fully released	0.45 - 1.0 V
ACCEL SEN 1	(Engine stopped)	Accelerator pedal: Fully depressed	4.4 - 4.8 V
	Ignition switch: ON	Accelerator pedal: Fully released	0.45 - 1.0 V
ACCEL SEN 2*1	(Engine stopped) Accelerator pedal: Fully depressed		4.3 - 4.8 V

< ECU DIAGNOSIS INFORMATION >

Monitor Item		Condition	Values/Status
	Ignition switch: ON	Accelerator pedal: Fully released	More than 0.36 V
TP SEN 1-B1	(Engine stopped)Selector lever: D position	Accelerator pedal: Fully depressed	Less than 4.75 V
4	Ignition switch: ON	Accelerator pedal: Fully released	More than 0.36 V
TP SEN 2-B1* ¹	(Engine stopped)Selector lever: D position	Accelerator pedal: Fully depressed	Less than 4.75 V
FUEL T/TMP SE	Ignition switch: ON		Indicates fuel tank tempera- ture
EVAP SYS PRES	Ignition switch: ON		Approx. 1.8 - 4.8 V
FUEL LEVEL SE	Ignition switch: ON		Depending on fuel level of fuel tank
START SIGNAL	• Ignition switch: ON \rightarrow START \rightarrow	ON	$OFF \to ON \to OFF$
CLSD THL POS	Ignition switch: ON	Accelerator pedal: Fully released	ON
CLSD THE POS	(Engine stopped)	Accelerator pedal: Slightly depressed	OFF
	Engine: After warming up, idle	Air conditioner switch: OFF	OFF
AIR COND SIG	the engine	Air conditioner switch: ON (Compressor operates.)	ON
DW/ST SIGNAL	Engine: After warming up, idle	Steering wheel: Not being turned	OFF
PW/ST SIGNAL	the engine	Steering wheel: Being turned	ON
LOAD SIGNAL	Ignition switch: ON	Rear window defogger switch: ON and/or Lighting switch: 2nd position	ON
EO/ID GIGITALE	igiliadii dwildii. Giv	Rear window defogger switch and lighting switch: OFF	OFF
IGNITION SW	Ignition switch: ON → OFF → O	$ON \to OFF \to ON$	
HEATER FAN SW	Engine: After warming up, idle	Heater fan switch: ON	ON
	the engine	Heater fan switch: OFF	OFF
BRAKE SW	• Ignition quitable ON	Brake pedal: Fully released	OFF
DRAKE SW	Ignition switch: ON	Brake pedal: Slightly depressed	ON
	Engine: After warming up	Idle	2.0 - 3.0 msec
INJ PULSE-B1	Selector lever: P or N positionA/C switch: OFFNo load	2,000 rpm	1.9 - 2.9 msec
	Engine: After warming up	Idle	2.0 - 3.0 msec
INJ PULSE-B2	Selector lever: P or N positionA/C switch: OFFNo load	2,000 rpm	1.9 - 2.9 msec
	Engine: After warming up	Idle	12 - 22°BTDC
IGN TIMING	Selector lever: P or N positionA/C switch: OFFNo load	2,000 rpm	25 - 45°BTDC
	Engine: After warming up	Idle	5 - 35%
CAL/LD VALUE	Selector lever: P or N positionA/C switch: OFFNo load	2,500 rpm	5 - 35%
	Engine: After warming up	Idle	2.0 - 6.0 g·m/s
MASS AIRFLOW	Selector lever: P or N positionA/C switch: OFFNo load	2,500 rpm	7.0 - 20.0 g·m/s
PURG VOL C/V	Engine: After warming up Selector lever: P or N position A/C switch: OFF	Idle (Accelerator pedal: Not depressed even slightly, after engine starting.)	0%
	No load	2,000 rpm	

Monitor Item		Condition	Values/Status
	Engine: After warming up	Idle	–5° - 5°CA
XH/V TIM B1	Selector lever: P or N positionA/C switch: OFFNo load	Around 2,500 rpm while the engine speed is rising	Approx. 0 - 30°CA
	Engine: After warming up	Idle	–5 - 5°CA
XH/V TIM B2	Selector lever: P or N positionA/C switch: OFFNo load	Around 2,500 rpm while the engine speed is rising	Approx. 0 - 30°CA
	Engine: After warming up	Idle	0 - 2%
NT/V SOL (B1)	Selector lever: P or N positionA/C switch: OFFNo load	2,000 rpm	Approx. 0 - 50%
	Engine: After warming up	Idle	0 - 2%
NT/V SOL (B2)	Selector lever: P or N positionA/C switch: OFFNo load	2,000 rpm	Approx. 0 - 50%
	• Engine: After warming up idle	A/C switch: OFF	OFF
AIR COND RLY	Engine: After warming up, idle the engine	A/C switch: ON	ON
VENT CONT/V	Ignition switch: ON	(Compressor operates)	OFF
THRTL RELAY	Ignition switch: ON		ON
	Engine: After warming up, idle th	ne engine	
VF S1 HTR (B1)	(More than 140 seconds after sta	4 - 100%	
A/F S1 HTR (B2)	Engine: After warming up, idle the (More than 140 seconds after state)	4 - 100%	
HO2S2 HTR (B1)	 Engine speed: Below 3,600 rpm Engine: After warming up Keeping the engine speed between idle for 1 minute under no load 	ON	
	Engine speed: Above 3,600 rpm		OFF
HO2S2 HTR (B2)	 Engine speed: Below 3,600 rpm Engine: After warming up Keeping the engine speed between idle for 1 minute under no load 	ON	
	Engine speed: Above 3,600 rpm	OFF	
N T DUTY CIC	Power generation voltage variab	le control: Operating	ON
ALT DUTY SIG	Power generation voltage variab	le control: Not operating	OFF
/P PULLY SPD	Vehicle speed: More than 20 km	/h (12 MPH)	Almost the same speed as the tachometer indication
VEHICLE SPEED	Turn drive wheels and compare 0 dication.	CONSULT-III value with the speedometer in-	Almost the same speed as the speedometer indication
DL A/V LEARN	Engine: Running	Idle air volume learning has not been performed yet.	YET
DE / V V LEAININ	Linging. Ixaniming	Idle air volume learning has already been performed successfully.	CMPLT
TRVL AFTER MIL	Ignition switch: ON	Vehicle has traveled after MIL has illuminated.	0 - 65,535 km (0 - 40,723 miles)
SNOW MODE SW	Ignition switch: ON	Snow mode switch: ON	ON
PIAOAA IAIODE 2AA	ignition switch. Oiv	Snow mode switch: OFF	OFF
ENG OIL TEMP	Engine: After warming up		More than 70°C (158°F)
/HCL SPEED SE	Turn drive wheels and compare 0 dication.	CONSULT-III value with the speedometer in-	Almost the same speed as the speedometer indication

< ECU DIAGNOSIS INFORMATION >

Monitor Item	(Condition	Values/Status		
SET VHCL SPD	Engine: Running	ASCD: Operating	The preset vehicle speed is displayed		
MAIN SW	• Ignition quitable ON	MAIN switch: Pressed	ON		
IVIAIN SVV	Ignition switch: ON	MAIN switch: Released	OFF		
CANCEL SW	Ignition switch: ON	CANCEL switch: Pressed	ON		
CANCLE 3W	Ignition Switch. ON	CANCEL switch: Released	OFF		
DECLINATIA CO CIAI	Louisian australia ON	RESUME/ACCELERATE switch: Pressed	ON		
RESUME/ACC SW	Ignition switch: ON	RESUME/ACCELERATE switch: Released	OFF		
CET CW/	a Ignitian quitabi ON	SET/COAST switch: Pressed	ON		
SET SW	Ignition switch: ON	SET/COAST switch: Released	OFF		
BRAKE SW1		Brake pedal: Fully released	ON		
(ASCD/ICC brake switch)	Ignition switch: ON	Brake pedal: Slightly depressed	OFF		
BRAKE SW2	a Ignitian quitabi ON	Brake pedal: Fully released	OFF		
(Stop lamp switch)	Ignition switch: ON	Brake pedal: Slightly depressed	ON		
DIST SW	• Ignition quitable ON	DISTANCE switch: Pressed	ON		
DIST 300	Ignition switch: ON	DISTANCE switch: Released	OFF		
VHCL SPD CUT	Ignition switch: ON	NON			
LO SPEED CUT	Ignition switch: ON	NON			
AT OD MONITOR	Ignition switch: ON		OFF		
AT OD CANCEL	Ignition switch: ON	OFF			
CRUISE LAMP	Ignition switch: ON	MAIN switch: Pressed at the 1st time \rightarrow at the 2nd time	$ON \to OFF$		
	MAIN switch: ON	ASCD: Operating	ON		
SET LAMP	 When vehicle speed is between 40 km/h (25 MPH) and 144 km/h (89 MPH) 	ASCD: Not operating	OFF		
	Fasing Dunging	Exhaust Valve Timing Control Learning has not been performed yet.	YET		
EXH V/T LEARN	Engine: Running	Exhaust Valve Timing Control Learning has not been performed yet.	CMPLT		
FAN DUTY	Engine: Running		0 - 100%		
ALT DUTY	Engine: Idle		0 - 80%		
BAT CUR SEN	 Engine speed: Idle Battery: Fully charged*² Selector lever: P or N position A/C switch: OFF No load 	 Engine speed: Idle Battery: Fully charged*² Selector lever: P or N position A/C switch: OFF 			
A/F ADJ-B1	Engine: Running	-0.330 - 0.330			
A/F ADJ-B2	Engine: Running		-0.330 - 0.330		
	Ignition switch: ON	Accelerator pedal: Fully released	More than 0.36 V		
TP SEN 1-B2	(Engine stopped)Selector lever: D position	Accelerator pedal: Fully depressed	Less than 4.75 V		
	Ignition switch: ON	Accelerator pedal: Fully released	More than 0.36 V		
TP SEN 2-B2* ¹	(Engine stopped)Selector lever: D position	Accelerator pedal: Fully depressed	Less than 4.75 V		
P/N POSI SW	Ignition switch: ON	Selector lever: P or N	ON		
	J 2 2	Selector lever: Except above position	OFF		

0

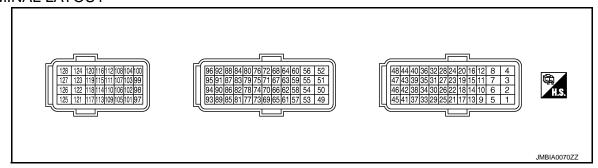
Р

Monitor Item		Values/Status	
INT/A TEMP SE	Ignition switch: ON	Indicates intake air temperature	
AC PRESS SEN	Engine: Idle Both A/C switch and blower fan	switch: ON (Compressor operates)	1.0 - 4.0 V
	Engine: After warming up	Idle	0% - 2%
VTC DTY EX B1	Selector lever: P or N positionA/C switch: OFFNo load	Around 2,500 rpm while the engine speed is rising	Approx. 0% - 70%
	Engine: After warming up	Idle	0 - 2%
VTC DTY EX B2	Selector lever: P or N positionA/C switch: OFFNo load	Around 2,500 rpm while the engine speed is rising	Approx. 0 - 70%
	Engine: After warming up	Idle	–5 - 5°CA
INT/V TIM (B1)	Selector lever: P or N positionA/C switch: OFFNo load	2,000 rpm	Approx. 0 - 30°CA
	Engine: After warming up	Idle	–5 - 5°CA
NT/V TIM (B2) • Selector lever: P or N positi • A/C switch: OFF • No load		2,000 rpm	Approx. 0 - 30°CA
VVEL LEARN	Ignition switch: OFF → ON	VVEL learning has not been performed yet.	YET
	(After warming up)	VVEL learning has already been performed successfully.	DONE
VVEL SEN LEARN-B1	VVEL learning has already been	Approx. 0.30 - 0.80 V	
VVEL SEN LEARN-B2	VVEL learning has already been	performed successfully	Approx. 0.30 - 0.80 V
W/FL DOCITION CEN	Engine: After warming up Calcutar layer: D. or N. position	Idle	Approx. 0.25 - 1.40 V
VVEL POSITION SEN- B1	Selector lever: P or N positionA/C switch: OFFNo load	When revving engine up to 2,000 rpm quickly	Approx. 0.25 - 4.75 V
	Engine: After warming up	Idle	Approx. 0.25 - 1.40 V
VVEL POSITION SEN- B2	Selector lever: P or N positionAir conditioner switch: OFFNo load	When revving engine up to 2,000 rpm quickly	Approx. 0.25 - 4.75 V
	Engine: After warming up	Idle	Approx. 0 - 20 deg
VVEL TIM-B1	Selector lever: P or N positionA/C switch: OFFNo load	When revving engine up to 2,000 rpm quickly	Approx. 0 - 90 deg
	Engine: After warming up	Idle	Approx. 0 - 20 deg
VVEL TIM-B2	Selector lever: P or N positionA/C switch: OFFNo load	When revving engine up to 2,000 rpm quickly	Approx. 0 - 90 deg
	Engine: Cranking	,	HI
FPCM	Engine: Idle Engine coolant temperature: Mo	re than 10°C (50°F)	LOW

^{*1:} Accelerator pedal position sensor 2 signal and throttle position sensor 2 signal are converted by ECM internally. Thus, they differ from ECM terminals voltage signal.

^{*2:} Before measuring the terminal voltage, confirm that the battery is fully charged. Refer to PG-3, "How to Handle Battery".

TERMINAL LAYOUT



PHYSICAL VALUES

NOTE:

- ECM is located behind the instrument assist lower panel. For this inspection, remove passenger side instrument lower panel.
- Specification data are reference values and are measured between each terminals.
- Pulse signal is measured by CONSULT-III.

Termin (Wire		Description		Condition	Value	
+	_	Signal name	Input/ Output	Condition	(Approx.)	
1 (P)	128 (B)	Throttle control motor power supply (bank 2)	Input	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)	
2	128	Throttle control motor (bank 2)	Output	[Ignition switch: ON]Engine: StoppedSelector lever: D positionAccelerator pedal: Fully depressed	0 - 14 V★ 500µSec/div 5V/div JMBIA0031GB	
(L)	(B)	(Open)		[Ignition switch: ON] • Engine: Stopped • Selector lever: D position • Accelerator pedal: Fully released	0 - 14 V★ 500μSec/div 5V/div JMBIA0032GB	
3 (Y)	128 (B)	A/F sensor 1 heater (bank 1)	Output	[Engine is running]Warm-up conditionIdle speed (More than 140 seconds after starting engine)	2.9 - 8.8 V★ 50mSec/div 5V/div JMBIA0030GB	
4 (G)	128 (B)	A/F sensor 1 heater (bank 2)	Output	[Engine is running]Warm-up conditionIdle speed (More than 140 seconds after starting engine)	2.9 - 8.8 V★ 50mSec/div 5V/div JMBIA0030GB	

Terminal No. (Wire color)		Description		Con distant	Value
+	-	Signal name	Input/ Output	Condition	(Approx.)
5 (R)	128 (B)	Throttle control motor (bank 2) (Close)	Output	 [Ignition switch: ON] Engine: Stopped Selector lever: D position Accelerator pedal: In the middle of releasing operation 	0 - 14 V★ 500μSec/div 5V/div JMBIA0033GB
6 (GR)	_	ECM ground	_	_	_
8	128	EVAP canister purge volume	Output	[Engine is running]Idle speedAccelerator pedal: Not depressed even slightly, after engine starting	BATTERY VOLTAGE (11 - 14 V)★ 50mSec/div 10V/div JMBIA0039GB
	control solenoid valve	Output	[Engine is running]Engine speed: About 2,000 rpm (More than 100 seconds after starting engine)	BATTERY VOLTAGE (11 - 14 V) 50mSec/div 10V/div JMBIA0040GB	
9 (G) 10 (Y) 13 (V) 14 (GR)	128	Ignition signal No. 2 Ignition signal No. 1 Ignition signal No. 3 Ignition signal No. 4		 [Engine is running] Warm-up condition Idle speed NOTE: The pulse cycle changes depending on rpm at idle 	0 - 0.2 V★ 2.0V/Div 50 ms/Div PBIB0044E
18 (SB) 22 (LG) 26 (L) 30 (Y)	(B)	Ignition signal No. 5 Ignition signal No. 6 Ignition signal No. 7 Ignition signal No. 8	Output -	[Engine is running]Warm-up conditionEngine speed: 2,000 rpm	0.1 - 0.4 V★
15 (O)	128 (B)	ECM relay (Self shut-off)	Output	 [Engine is running] [Ignition switch: OFF] A few seconds after turning ignition switch OFF [Ignition switch: OFF] More than a few seconds after turn- 	0 - 1.5 V BATTERY VOLTAGE

Termin (Wire	nal No. color)	Description		- Condition	Value
+	_	Signal name	Input/ Output		(Approx.)
17 (R)		Fuel injector No. 3		[Engine is running]	BATTERY VOLTAGE (11 - 14 V)★
21 (W) 25		Fuel injector No. 2		Warm-up conditionIdle speedNOTE:	
(P) 29		Fuel injector No. 1		The pulse cycle changes depending on rpm at idle	
(O) 33	128 (B)	Fuel injector No. 7	Output		№ 10.0V/DIV 50 ms/DIV PBIB0042E BATTERY VOLTAGE
(G) 37		Fuel injector No. 8 Fuel injector No. 4			(11 - 14 V)★
(BR) 41 (W)		Fuel injector No. 5		[Engine is running]Warm-up conditionEngine speed: 2,000 rpm	
45 (V)		Fuel injector No. 6			>> 10.0V/Div 50 ms/Div PBIB0043E
19 (L)	128 (B)	Throttle control motor relay	Output	[Ignition switch: ON → OFF]	0 - 1.0 V ↓ BATTERY VOLTAGE (11 - 14 V) ↓ 0 V
23 (BR)	_	Sensor ground (Engine coolant temperature sensor)	_	[Ignition switch: ON]	0 - 1.0 V
24 (Y)	23 (BR)	Engine coolant temperature sensor	Input	[Engine is running]	0 - 4.8 V Output voltage varies with engine coolant temperature.
31 (B)	_	Sensor ground (Heated oxygen sensor 2)	_		_
32 (W)	31 (B)	Heated oxygen sensor 2 (bank 1)	Input	 [Engine is running] Revving engine from idle to 3,000 rpm quickly after the following conditions are met Engine: after warming up Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load 	0 - 1.0 V
34 (V)	_	Sensor ground (Engine oil temperature sensor)	_	_	_
35 (B/W)	_	Sensor ground (Knock sensor)	_	_	_
36 (LG)	31 (B)	Heated oxygen sensor 2 (bank 2)	Input	 [Engine is running] Revving engine from idle to 3,000 rpm quickly after the following conditions are met Engine: after warming up Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load 	0 - 1.0 V

Terminal No. (Wire color)		Description		0 111	Value			
+	_	Signal name	Input/ Output	Condition	(Approx.)			
38 (GR)	_	Sensor ground [Mass air flow sensor (bank 2)]	_	_	_			
39 (R)	34 (V)	Engine oil temperature sensor	Input	[Engine is running]	0 - 4.8 V Output voltage varies with engine oil temperature.			
40 (W)	35 (B/W)	Knock sensor (bank 1)	Input	[Engine is running] • Idle speed	2.5 V* ¹			
42 (B)	_	Sensor ground [Mass air flow sensor (bank 1)/ Intake air temperature sensor]	_	_	_			
43	38	Mass air flow sensor (bank 2)	Input	[Engine is running]Warm-up conditionIdle speed	0.8 - 1.1 V			
(SB)	(GR)	Mass all How Sellson (Dalik 2)	Input	input	[Engine is running]Warm-up conditionEngine speed: 2,500 rpm	1.3 - 1.6 V		
44 (W)	35 (B/W)	Knock sensor (bank 2)	Input	[Engine is running] • Idle speed	2.5 V* ¹			
47	47 42	Maga air flaw gangar (bank 1)	Mass sir flow concer (bank 1)	Mass air flow sensor (hank 1)	Mass air flow sensor (bank 1)	Input	[Engine is running]Warm-up conditionIdle speed	0.8 - 1.1 V
(L)	(B)	wass all now sensor (bank 1)	Input	[Engine is running]Warm-up conditionEngine speed: 2,500 rpm	1.3 - 1.6 V			
48 (Y)	42 (B)	Intake air temperature sensor	Input	[Engine is running]	0 - 4.8 V Output voltage varies with intake air temperature.			
49 (V)	128 (B)	Throttle control motor power supply (bank 1)	Input	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)			
50	128	Throttle control motor (bank 1)	Outout	[Ignition switch: ON] • Engine: Stopped • Selector lever: D position • Accelerator pedal: Fully depressed	0 - 14 V★ 500μSec/div 5V/div JMBIA0031GB			
(G) (B)	(Open)	Output	[Ignition switch: ON] • Engine: Stopped • Selector lever: D position • Accelerator pedal: Fully released	0 - 14 V★ 500μSec/div 5V/div JMBIA0032GB				

Termin (Wire		Description		Condition	Value
+	_	Signal name	Input/ Output		(Approx.)
				[Engine is running]Warm-up conditionIdle speed	BATTERY VOLTAGE (11 - 14 V)
51 (O)	128 (B)	Intake valve timing control so- lenoid valve (bank 1)	Output	[Engine is running]Warm-up conditionEngine speed: 2,000rpm	7 - 12 V★ 5V/div JMBIA0038GB
				[Engine is running]Warm-up conditionIdle speed	BATTERY VOLTAGE (11 - 14 V)
52 (L)		Intake valve timing control so- lenoid valve (bank 2)	Output	[Engine is running]Warm-up conditionEngine speed: 2,000rpm	7 - 12V★ 5V/div JMBIA0038GB
53 (BR)	128 (B)	Throttle control motor (bank 1) (Close)	Output	 [Ignition switch: ON] Engine: Stopped Selector lever: D position Accelerator pedal: In the middle of releasing operation 	0 - 14 V★ 500μSec/div 5V/div JMBIA0033GB
54 (B)	_	ECM ground	_	_	_
55 (P)	128 (B)	Heated oxygen sensor 2 heater (bank 2)	Output	 [Engine is running] Engine speed: Below 3,600 rpm after the following conditions are met Engine: after warming up Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load 	10 V★ 50mSec/div 5V/div JMBIA0037GB
				[Ignition switch: ON]Engine: Stopped[Engine is running]Engine speed: Above 3,600 rpm	BATTERY VOLTAGE (11 - 14 V)

Р

< <u>ECO</u>	DIAGI	NOSIS INFORMATION >			[**************************************	
	nal No. color)	Description		Condition	Value	А
+	_	Signal name	Input/ Output	Condition	(Approx.)	
56 (R)	128 (B)	Heated oxygen sensor 2 heater (bank 1)	Output	 [Engine is running] Engine speed: Below 3,600 rpm after the following conditions are met Engine: after warming up Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load 	10 V★ 50mSec/div 5V/div JMBIA0037GB	C D
				[Ignition switch: ON]Engine: Stopped[Engine is running]Engine speed: Above 3,600 rpm	BATTERY VOLTAGE (11 - 14 V)	Е
				[Engine is running]Warm-up conditionIdle speed	BATTERY VOLTAGE (11 - 14 V)	F
57 (Y)	128 (B)	Exhaust valve timing control solenoid valve (bank 2)	Output	[Engine is running]Warm-up conditionAround 2,500 rpm while the engine speed is rising	7 - 12 V★ 5V/div JMBIA0034GB	G
58 (B)	_	Sensor ground [Camshaft position sensor (bank 1)/ Exhaust valve timing control position sensor (bank 1)]	_	_	_	J
59	58	Camshaft position sensor		 [Engine is running] Warm-up condition Idle speed NOTE: The pulse cycle changes depending on rpm at idle 	3.0 - 5.0 V★ 20mSec/div 2V/div 3MBIA0045GB	K
(W)	(B)	(bank 1)	Input	[Engine is running] • Engine speed: 2,000 rpm	3.0 - 5.0 V★ 20mSec/div 2V/div JMBIA0046GB	M N

	Terminal No. (Wire color) Descrip			Condition	Value
+	-	Signal name	Input/ Output	Condition	(Approx.)
60	58	Exhaust valve timing control		 [Engine is running] Warm-up condition Idle speed NOTE: The pulse cycle changes depending on rpm at idle 	4.0 - 5.0 V★ 20mSec/div 2V/div JMBIA0043GB
(G)	(B)	position sensor (bank 1)	Input	[Engine is running]Warm-up conditionEngine speed: 2,000 rpm	4.0 - 5.0 V★ 20mSec/div 2V/div JMBIA0044GB
				[Engine is running]Warm-up conditionIdle speed	BATTERY VOLTAGE (11 - 14 V)
61 (G)		Output	[Engine is running]Warm-up conditionAround 2,500 rpm while the engine speed is rising	7 - 12 V★ 5V/div JMBIA0034GB	
62 (O)	_	Sensor ground [Camshaft position sensor (bank 2)/ Exhaust valve timing control position sensor (bank 2)]	_	_	_
63	62	Camshaft position sensor (bank 2)	Input	 [Engine is running] Warm-up condition Idle speed NOTE: The pulse cycle changes depending on rpm at idle 	3.0 - 5.0 V★ 20mSec/div 2V/div JMBIA0045GB
(BR)	(O)			[Engine is running] • Engine speed: 2,000 rpm	3.0 - 5.0 V★ 20mSec/div 2V/div JMBIA0046GB

Terminal No. (Wire color)		Description		0.00	Value
+	_	Signal name	Input/ Output	Condition	(Approx.)
64	62	Exhaust valve timing control	logut	 [Engine is running] Warm-up condition Idle speed NOTE: The pulse cycle changes depending on rpm at idle 	4.0 - 5.0 V★ 20mSec/div 2V/div JMBIA0043GB
(P)	(O)	position sensor (bank 2)	Input	[Engine is running]Warm-up conditionEngine speed: 2,000 rpm	4.0 - 5.0 V★ 20mSec/div 2V/div JMBIA0044GB
65 (LG)	128 (B)	VVEL actuator motor relay abort signal (VVEL control module)	Output	[Engine is running]Warm-up conditionIdle speed	0 V
66 (GR)	_	Sensor ground (Power steering pressure sen- sor/ Refrigerant pressure sen- sor)	_	_	_
67	68		lana.	 [Engine is running] Warm-up condition Idle speed NOTE: The pulse cycle changes depending on rpm at idle 	4.0 - 5.0 V★ 1mSec/div 2V/div JMBIA0041GB
(Y)	(B)	Crankshaft position sensor	Input	[Engine is running] • Engine speed: 2,000 rpm	4.0 - 5.0 V★ 1mSec/div 2V/div JMBIA0042GB
68 (B)	_	Sensor ground (Crankshaft position sensor)	_	_	_
69 (W)	70 (B)	Manifold pressure sensor (This sensor is not for control- ling the engine system, nor for the on board diagnosis.)	Input	 [Engine is running] Warm-up condition Idle speed [Engine is running] Warm-up condition Engine speed: 2,000 rpm 	1.2 V 1.5 V
70 (B)	_	Sensor ground [Battery current sensor/ EVAP control system pressure sen- sor/ Manifold pressure sensor]	_	_	_
71 (R)	_	Sensor ground [Throttle position sensor (bank 1)]	_	_	_

	nal No. color)	Description		Condition	Value
+	_	Signal name	Input/ Output	(Approx.)	(Approx.)
72 (Y)	_	Sensor ground [Throttle position sensor (bank 2)]	_	_	_
73	71	Throttle position sensor 1	Input	[Ignition switch: ON] Engine: Stopped Selector lever: D position Accelerator pedal: Fully released	More than 0.36 V
(L)	(R)	(bank 1)	input	[Ignition switch: ON]Engine: StoppedSelector lever: D positionAccelerator pedal: Fully depressed	Less than 4.75 V
74	72	Throttle position sensor 2	Input	[Ignition switch: ON]Engine: StoppedSelector lever: D positionAccelerator pedal: Fully released	Less than 4.75 V
(R)	(Y)	bank 2)	input	[Ignition switch: ON]Engine: StoppedSelector lever: D positionAccelerator pedal: Fully depressed	More than 0.36 V
76 (G)	70 (B)	Battery current sensor	Input	 [Engine is running] Battery: Fully charged*² Idle speed 	2.6 - 3.5 V
77	72	Throttle position sensor 1		[Ignition switch: ON]Engine: StoppedSelector lever: D positionAccelerator pedal: Fully released	More than 0.36 V
(B)	(Y)	(bank 2)	Input	[Ignition switch: ON]Engine: StoppedSelector lever: D positionAccelerator pedal: Fully depressed	Less than 4.75 V
78	71	Throttle position sensor 2	[Ignition switch: ON] • Engine: Stopped • Selector lever: D position • Accelerator pedal: Fully released	Engine: StoppedSelector lever: D position	Less than 4.75 V
(Y)	(R)	(bank 1)	Input	[Ignition switch: ON]Engine: StoppedSelector lever: D positionAccelerator pedal: Fully depressed	More than 0.36 V
80 (GR)	70 (B)	EVAP control system pressure sensor	Input	[Ignition switch: ON]	1.8 - 4.8 V
81 (V)	128 (B)	A/F sensor 1 (bank 1)	Input	[Ignition switch: ON]	2.2 V
82 (LG)	128 (B)	A/F sensor 1 (bank 1)	Input	[Engine is running]Warm-up conditionEngine speed: 2,000 rpm	1.8 V Output voltage varies with air fuel ratio.
83	66 (GR)	Power steering pressure sensor	Output	[Engine is running]Steering wheel: Being turned	0.5 - 4.5 V
(SB)				[Engine is running]Steering wheel: Not being turned	0.4 - 0.8 V
84 (B)	71 (R)	Sensor power supply [Throttle position sensor (bank 1)]	_	[Ignition switch: ON]	5 V
85 (Y)	128 (B)	A/F sensor 1 (bank 2)	Input	[Ignition switch: ON]	2.2 V

Terminal No. (Wire color)		Description			Value
+	_	Signal name	Input/ Output	Condition	(Approx.)
86 (O)	128 (B)	A/F sensor 1 (bank 2)	Input	[Engine is running]Warm-up conditionEngine speed: 2,000 rpm	1.8 V Output voltage varies with air fuel ratio.
87 (R)	68 (B)	Sensor power supply (Crankshaft position sensor)	_	[Ignition switch: ON]	5 V
88 (Y)	62 (O)	Sensor power supply [Camshaft position sensor (bank 2)/ Exhaust valve timing control position sensor (bank 2)]	_	[Ignition switch: ON]	5 V
89 (P)	_	CAN communication line (VVEL control module)	Input/ Output	_	_
90 (G)	66 (GR)	Refrigerant pressure sensor	Input	 [Engine is running] Warm-up condition Both A/C switch and blower fan motor switch: ON (Compressor operates) 	1.0 - 4.0 V
91 (R)	58 (B)	Sensor power supply [Camshaft position sensor (bank 1)/ Exhaust valve timing control position sensor (bank 1)]	_	[Ignition switch: ON]	5 V
92 (W)	66 (GR)	Sensor power supply (Power steering pressure sen- sor/ Refrigerant pressure sen- sor)	_	[Ignition switch: ON]	5 V
93 (LG)	_	CAN communication line (VVEL control module)	Input/ Output	_	_
95 (Y)	70 (B)	Sensor power supply [Battery current sensor/ EVAP control system pressure sen- sor/ Manifold pressure sensor]	_	[Ignition switch: ON]	5 V
96 (L)	72 (Y)	Sensor power supply [Throttle position sensor (bank 2)]	_	[Ignition switch: ON]	5 V
				[Engine is running]Warm-up conditionIdle speedNOTE:	1 V★ 10mSec/div
97	128	Engine speed output signal	Outout	The pulse cycle changes depending on rpm at idle	2V/div JMBIA0076GB
(R)	(B)	Engine speed output signal	Output	[Engine is running] • Engine speed is 2,000 rpm	1 V★ 10mSec/div 2V/div JMBIA0077GB
99 (L)* ³ (G)* ⁴	115 (GR)	Sensor power supply (Accelerator pedal position sensor 2)	_	[Ignition switch: ON]	5 V

Termin (Wire		Description		Condition	Value
+	_	Signal name	Input/ Output	Condition	(Approx.)
100 (G)* ³ (L)* ⁴	119 (W)	Sensor power supply (Accelerator pedal position sensor 1)	_	[Ignition switch: ON]	5 V
101 (P)	_	CAN communication line	Input/ Output	_	_
				[Ignition switch: ON] • ASCD steering switch: OFF	4 V
				[Ignition switch: ON] • MAIN switch: Pressed	0 V
102 (SB)	111 (V)	ASCD steering switch	Input	[Ignition switch: ON] • CANCEL switch: Pressed	1 V
(- /				[Ignition switch: ON] • RESUME/ACCELERATE switch: Pressed	3 V
				[Ignition switch: ON] • SET/COAST switch: Pressed	2 V
				[Ignition switch: ON] • ICC steering switch: OFF	4.2 V
				[Ignition switch: ON] • MAIN switch: Pressed	0 V
		ICC steering switch	Input	[Ignition switch: ON] • CANCEL switch: Pressed	1.9 V
102 (SB)	111 (V)			[Ignition switch: ON] • RESUME/ACCELERATE switch: Pressed	3.7 V
				[Ignition switch: ON] • SET/COAST switch: Pressed	3.2 V
				[Ignition switch: ON] • DISTANCE switch: Pressed	2.6 V
				[Ignition switch: ON] • LDP switch: Pressed	1.0 V
104	119	Accelerator pedal position	Input	[Ignition switch: ON]Engine: StoppedAccelerator pedal: Fully released	0.45 - 1.0 V
(R)	(W)	sensor 1	input	[Ignition switch: ON]Engine: StoppedAccelerator pedal: Fully depressed	4.4 - 4.8 V
105 (L)	_	CAN communication line	Input/ Output	_	_
106	128	Ignition quitch	lnn::4	[Ignition switch: OFF]	0 V
(L)	(B)	Ignition switch	Input	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)
108 (Y)* ³	115	Accelerator pedal position	Input -	[Ignition switch: ON] • Engine: Stopped • Accelerator pedal: Fully released	0.22 - 0.5 V
(P)* ⁴	(GR)	sensor 2		[Ignition switch: ON]Engine: StoppedAccelerator pedal: Fully depressed	2.1 - 2.5 V

Terminal No. (Wire color)		Description		Condition	Value
+	-	Signal name	Input/ Output	Condition	(Approx.)
110	128	Stan Jama quitab	Innut	[Ignition switch: OFF] • Brake pedal: Fully released	0 V
(P)	(B)	Stop lamp switch	Input	[Ignition switch: OFF] • Brake pedal: Slightly depressed	BATTERY VOLTAGE (11 - 14 V)
111 (V)	_	Sensor ground (ASCD steering switch)	_	_	_
				[When cranking engine]	0 V
112 (LG)	128 (B)	Fuel pump control module (FPCM) check	Input	[Engine is running]Warm-up conditionIdle speed	4 - 6 V
114 (GR)	_	Data link connector	Input/ Output	_	_
115 (BR)* ³ (GR)* ⁴	_	Sensor ground (Accelerator pedal position sensor 2)	_	_	_
116	128			[Ignition switch: ON] • Selector lever: P or N position	BATTERY VOLTAGE (11 - 14 V)
(G)	(B)	PNP switch	Input	[Ignition switch: ON]Selector lever: Except above position	0 V
117	128	ASCD brake switch	Input	[Ignition switch: ON] • Brake pedal: Slightly depressed	0 V
(BR)	(B)	AGOD DIAKE SWILLII	прис	[Ignition switch: ON] • Brake pedal: Fully released	BATTERY VOLTAGE (11 - 14 V)
118 (R)	128 (B)	Power supply for ECM (Back-up)	Input	[Ignition switch: OFF]	BATTERY VOLTAGE (11 - 14 V)
119 (W)	_	Sensor ground (Accelerator pedal position sensor 1)	_	_	_
120 (W)	128 (B)	Fuel tank temperature sensor	Input	[Engine is running]	0 - 4.8 V Output voltage varies with fuel tank temperature.
121 (GR)	128 (B)	Power supply for ECM	Input	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)
123 (B)	_	ECM ground	_	_	_
				[When cranking engine]	0 - 0.5 V
125 (R)	128 (B)	Fuel pump control module (FPCM)	Output	[Engine is running]Warm-up conditionIdle speed	8 - 12 V
127 (LG)	128 (B)	EVAP canister vent control valve	Output	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)
128 (B)	_	ECM ground	_	_	_

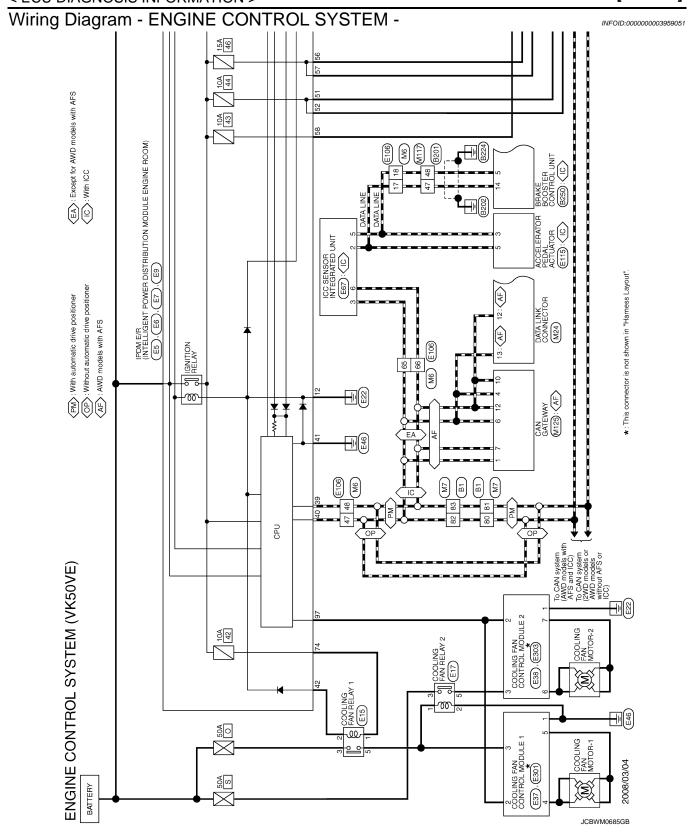
^{★:} Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

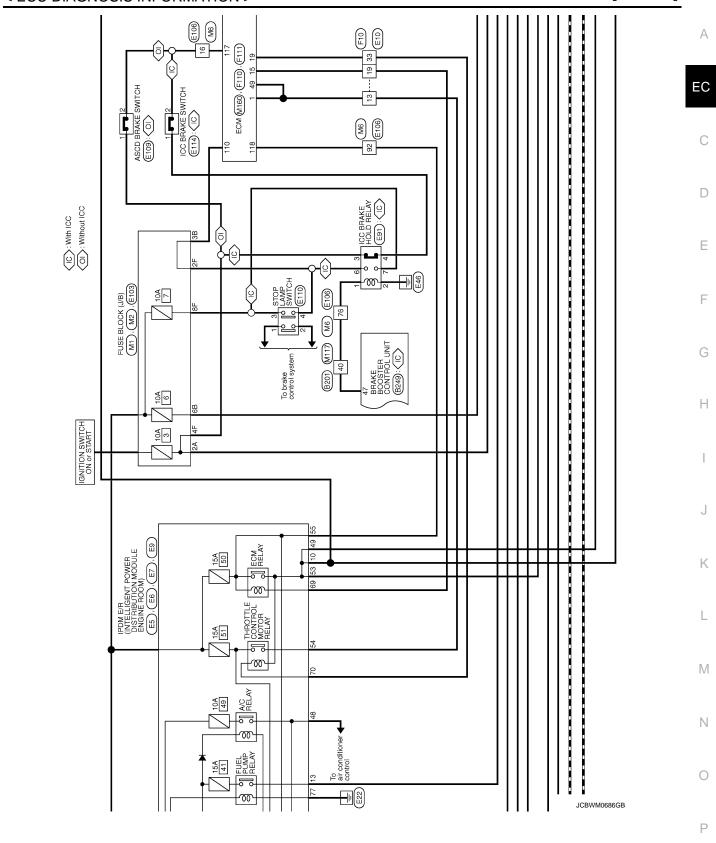
^{*1:} This may vary depending on internal resistance of the tester.

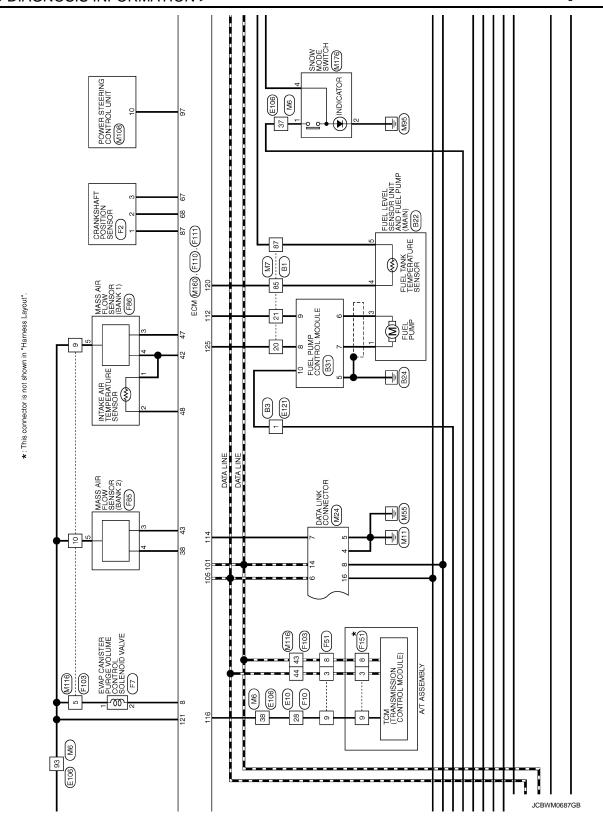
^{**2:} Before measuring the terminal voltage, confirm that the battery is fully charged. Refer to PG-3, "How to Handle Battery".

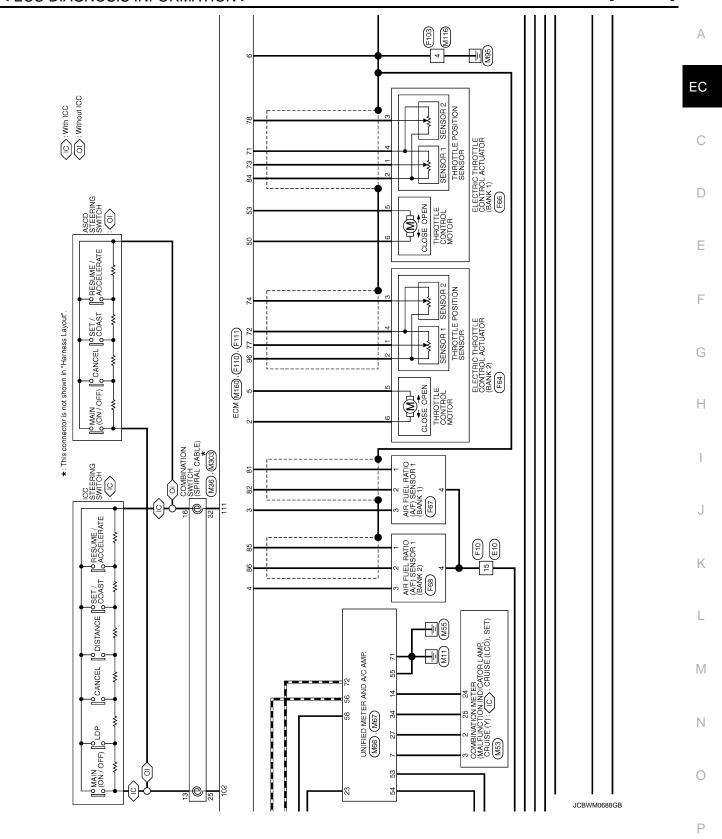
^{*3:} Models with ICC

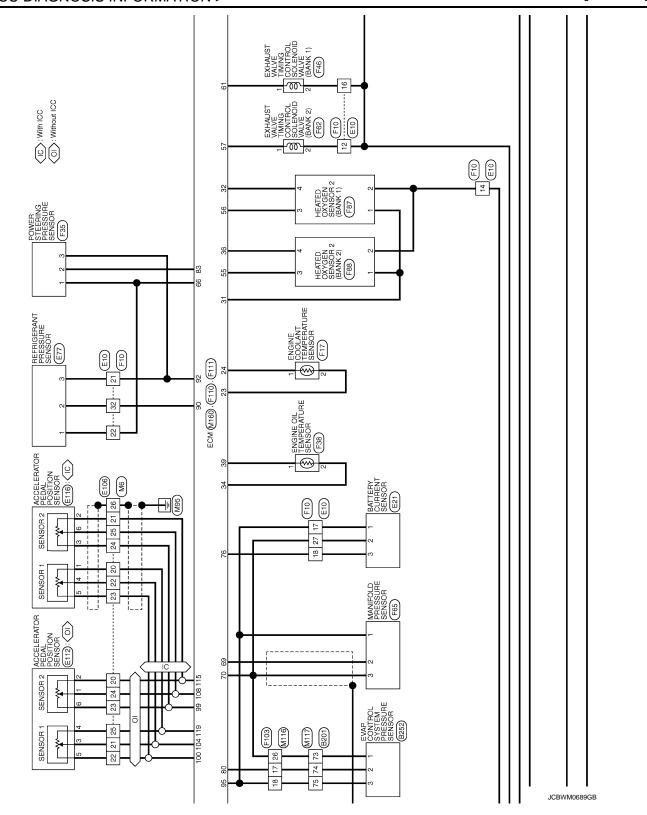
^{*4:} Models with ASCD

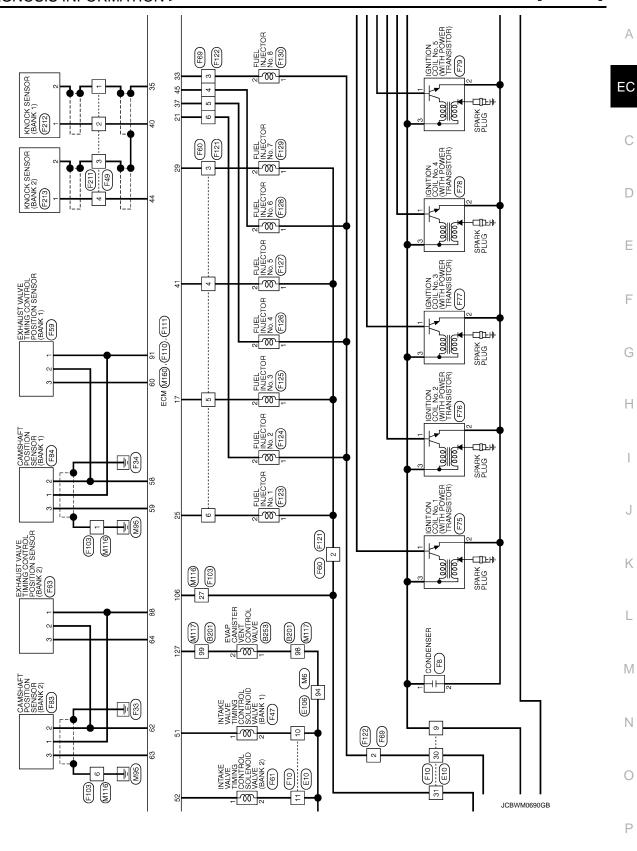


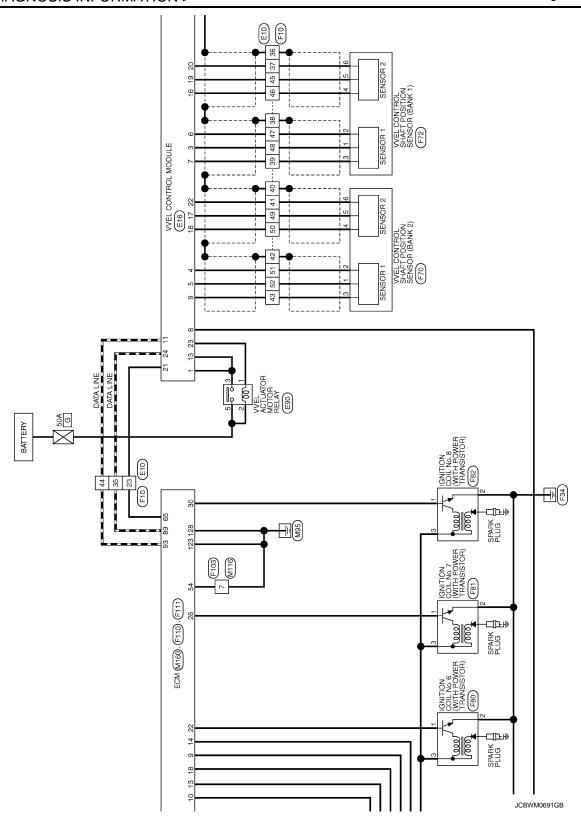












Α

EC

С

D

Е

F

G

Н

J

Κ

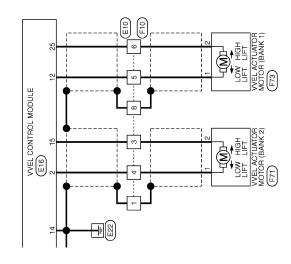
L

M

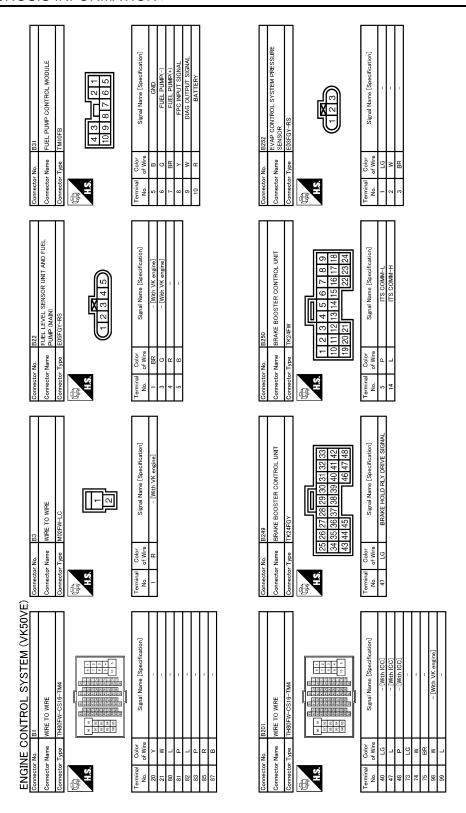
Ν

0

Ρ



JCBWM0692GB



JCBWM0693GB

Α

EC

С

D

Е

F

G

Н

1

J

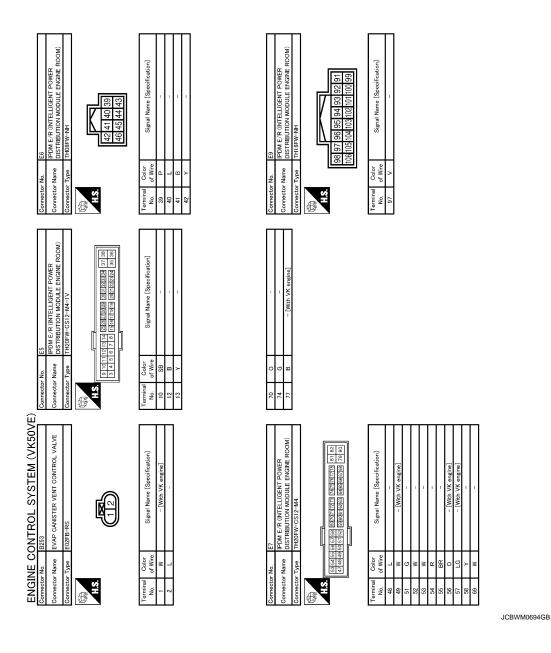
K

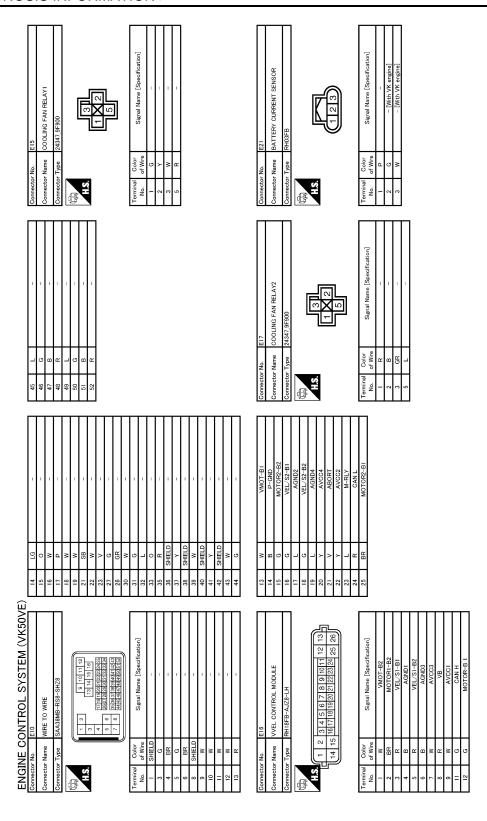
L

M

Ν

0

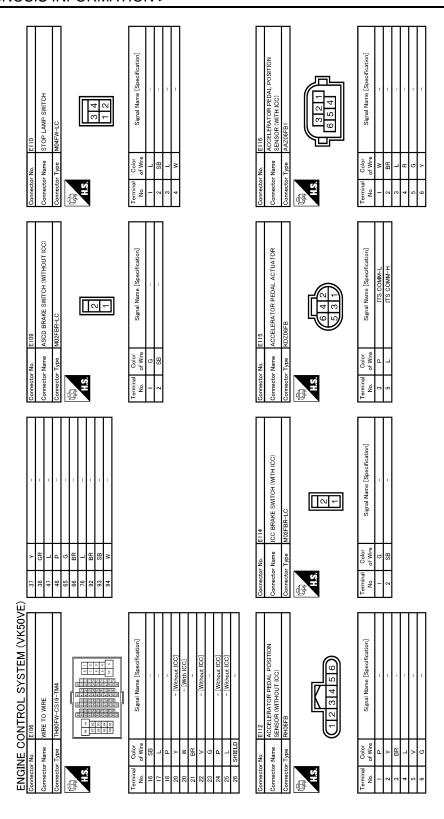




JCBWM0695GB

Connector No. E77 Connector Name REFRICERANT PRESSURE SENSOR Connector Type RKU3FB (1 2 3)	Terminal Color Signal Name [Specification]		A EC C
Connector No. E87 Connector Name ICC SENSOR INTEGRATED UNIT Connector Type RS306F8-FR 11.2 11.2 11.2 11.2 11.2 11.2 11.2 11	Terminal Color Signal Name [Specification] Color Col	Cornector No. E103 Connector Name FUSE BLOCK (J/B)	E F G
Connector No. E38 Connector Name COOLING FAN CONTROL MODULE2 Connector Type SJZ01FGY-SNZ2	Terminal Color No. of Wire Signal Name [Specification]	Connector No. E91	J K
ENGINE CONTROL SYSTEM (VK50VE) Connector Name COOLING FAN CONTROL MODULE1 Connector Type Su2DIFGV-SN22	Terminal Color Signal Name [Specification] Color Color Color Color	Connector No. E90 Connector Name VYEL ACTUATOR MOTOR RELAY Connector Type 24347,91900	L M N
		JCBWM06	96GB P

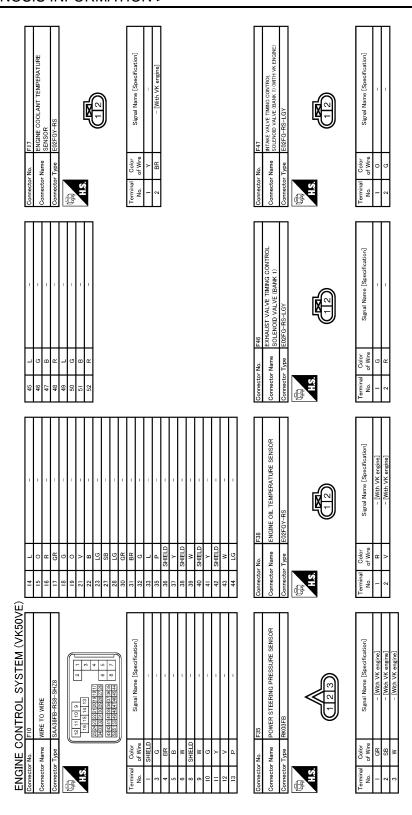
Revision: 2009 March EC-1155 2009 FX35/FX50



JCBWM0697GB

SENSOR		offication] ignel			ſ	А
Connector No. F2 Connector Name CRANKSHAFT POSITION SENSOR Connector Type RHG3FB	HS (123)	Terminal Color Signal Name [Specification] Color Col				C
E303 COOLING FAN CONTROL MODULE 2 (COOLING FAN MOTOR-2) 6188-0259		Signal Name (Specification)				E F
	N. H. S.	Terminal Golor No. of Wire 6 7				Н
E301 COOLING FAN CONTROL MODULE 1 (COOLING FAN MOTOR-1) 6186-0239	(4 E)	Signal Name [Specification]	E8 CONDENSER MOZFW-LC	Signal Name (Specification)		J
Connector No. Connector Name Connector Type	S.H.	Terminal Golor No. of Wire 4	Connector No. Connector Name Connector Type M.	Terminal Color Col		K
ENGINE CONTROL SYSTEM (VK50V Sonnector No. E121 Sonnector Name WIRE TO WIRE MOZAWA-LC SONNECTOR TO MOZAWA-LC	- 2	Signal Name [Specification]	EVAL CANISTER PURGE VOLUME EGOTTOL SOLENDID VALVE EGOTL-RS-LGY	Signal Name (Specification) - [With VK engine]		M
ENGINE CONTROL Connector No. E121 Connector Name WIRE TO WIRE Connector Type MOZMW-LC	H.S.	Terminal Golor Sig	Connector No. F7 Connector Name COMPROL SOLL Connector Type EQEL-RS-LGY	Color Colo		N O
[-1 0 10]			<u> </u>		JCBWM0698GB	Р
						-

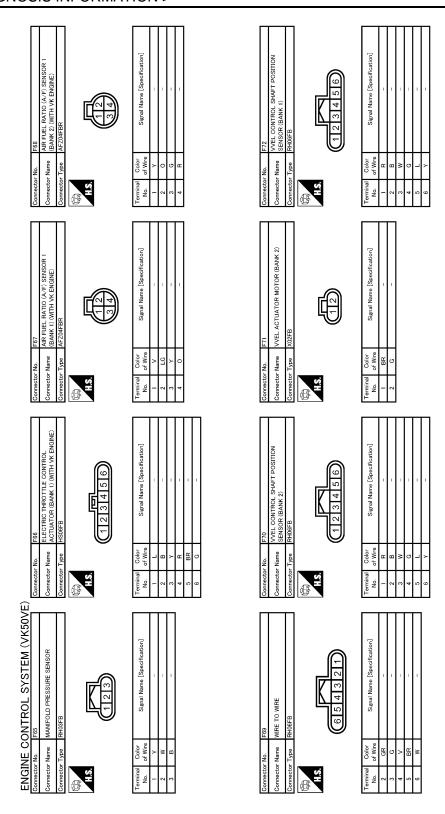
Revision: 2009 March EC-1157 2009 FX35/FX50



JCBWM0699GB

Connector No. F60 Connector Name WIRE TO WIRE Connector Type RH06FB	No. Color Signal Name [Specification] Color No. Color Signal Name [Specification] 2	Connector No. F64 Connector Name ELECTRIC THROTTLE CONTROL Connector Type HS08FB H.S. (123456)	Terminal Color Nigral Name [Specification]	A EC
Connector No. F59 Connector Name EXHAUST VALVE TIMENG CONTROL Connector Type RHG3FB Connector Type RHG3FB (123)	Terminal Color No. of Wire Signal Name [Specification]	Connector No. F63 Connector Name EXPANJST VALVE TIMENS CONTROL Connector Type PAPALST VALVE TIMENS CONTROL Connector Type RH03FB TH3.	Terminal Color Signal Name [Specification]	E F G
Connector No. F51 Connector Name A/T ASSEMBLY Connector Type RKIUFG-DGY M.S. F51 Connector Type RKIUFG-DGY (5 4 3 2 1)	Terminal Color Signal Name [Specification]	Comector No. F62 Comector Name SOLENDID VALVE TIMING CONTROL Comector Type E02FG-RS-LGY H.S.	Terminal Color Signal Name Specification	J K
ENGINE CONTROL SYSTEM (VK50VE Gennector No. F49 Connector Name WIRE TO WIRE Connector Type RSDAMS	Terminal Color Signal Name [Specification] 1 SHELD - 2 W -	Connector No. F61 Connector Name Infract valve Thanks control. Connector Type E02FG-FRS-LGY H.S.	Terminal Color No. of Wire Signal Name [Specification]	M N O
				P

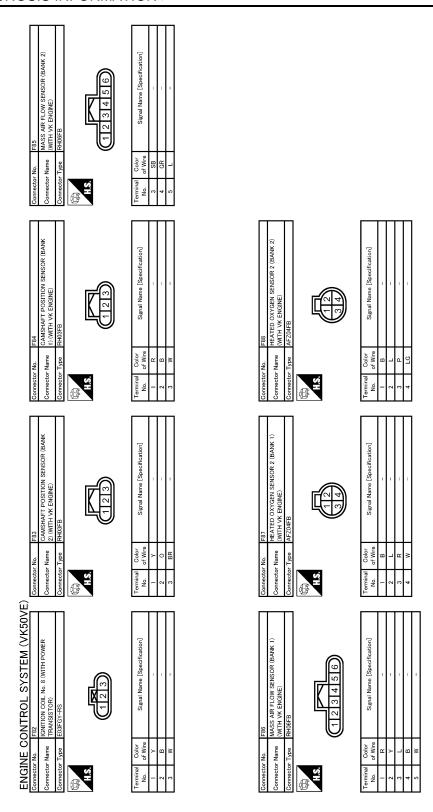
Revision: 2009 March **EC-1159** 2009 FX35/FX50



JCBWM0701GB

Connector No. F77 Connector Name (IGNITION COIL No. 3 (WITH POWER TRANSISTOR) (WITH VK ENGINE) Connector Type EGGFGY-RS H.S.	Color Signal Name [Specification] No. Color Signal Name [Specification]	Connector No. F81 Connector Name IGNITION COLL No. 7 (WITH POWER Connector Type EGGFGY-RS H.S.	Terminal Color Signal Name [Specification]	A EC C
Connector No. F76 Connector Name (IGMITION COIL No. 2 (WITH POWER Connector Type EGISFGY-RS H.S.	Terminal Color Signal Name (Specification) No. of Wire G C C C C C C C C C	Connector No. F80 Connector Name (IGNTION COLL No. 6 (WITH POWER COnnector Type EGGFCY-RS M.S. FANSISTOR (WITH VK ENGINE) M.S. FANSISTOR (WITH VK ENGINE) M.S. FANSISTOR (WITH VK ENGINE) M.S. FANSISTOR (WITH VK ENGINE)	Terminal Color Signal Name [Specification] 1 LG 2 B 3 W	E F G
Connector No. F75 Connector Name IGNITION COIL No. I (WITH POWER Connector Type E03FCV-RS LIS	Terninal Color Signal Name [Specification] Color	Connector No. F79 Connector Name IGNITION COIL No. 5 (WITH POWER TRANSISTOR) (WITH VK ENGINE) Connector Type EGGFGY-RS H.S.	Terminal Color No. of Wire 1 SB	J K
ENGINE CONTROL SYSTEM (VK50VE) Connector No. F73 Connector Name (VVEL ACTUATOR MOTOR (BANK 1) Connector Type (X027B) M.S. L.S. Color Signal Name [Specification] No. of Wire No. of Wire	Connector No. F78 Connector Name IGNITION COIL No. 4 (WITH POWER Connector Type EDGFGY-RS H.S. TRANSISTOR) (WITH VK ENGINE) TRANSISTOR) (WITH VK ENGINE)	Signal Name [Specification] No. of Wire Signal Name [Specification]	L M N	
ш ठ ठ ठ (년	ı́E III	[8] 8 [8] [발 조 및	[JCBWM0702GB
				Р

Revision: 2009 March EC-1161 2009 FX35/FX50



JCBWM0703GB

EC

Α

С

D

Е

F

G

Н

J

Κ

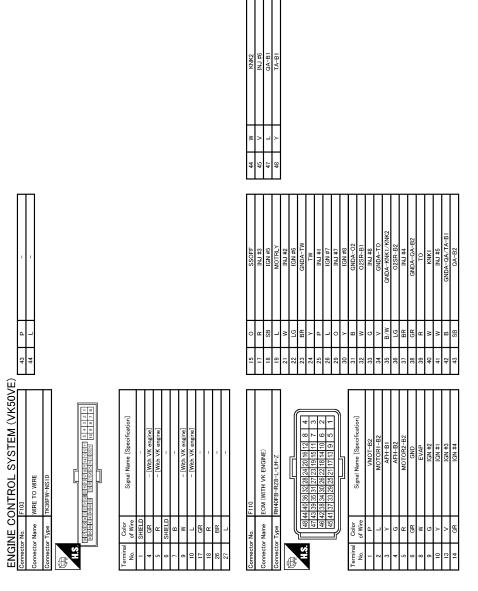
L

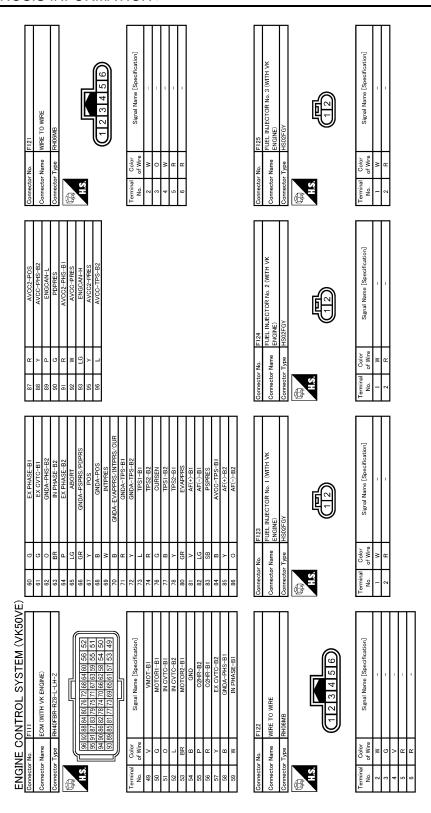
M

Ν

0

JCBWN	10704G

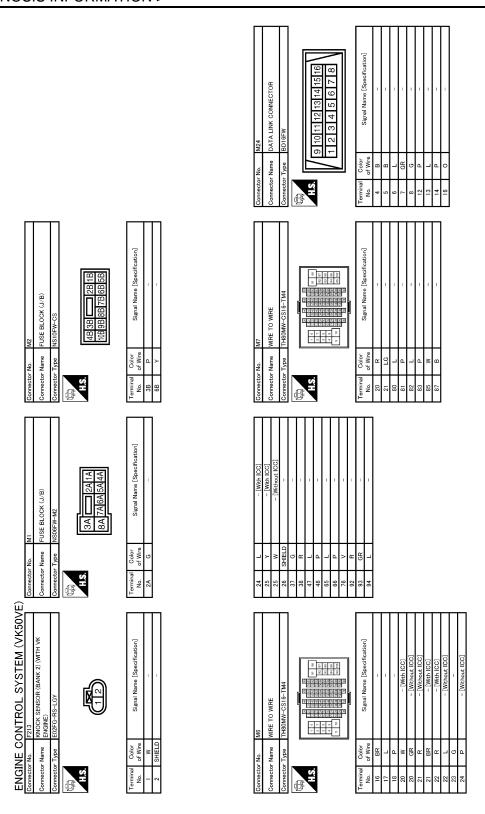




JCBWM0705GB

Connector No. F128 Connector Name FUEL INJECTOR No. 7 Connector Type HS02FGY	Terminal Color Signal Name [Specification] Name Signal Name Specification] 1 W	Connector No. F212 Connector Name (KNICOK SENSOR (BANK I) (WITH VK Connector Type EGGFG-RS-LGY LEGATOR (BANK I) (WITH VK CONNECTOR TYPE (BGGFG-RS-LGY LEGATOR (BANK I) (WITH VK CONNECTOR IN IN IN IN IN IN IN IN IN IN IN IN IN	Terminal Color Signal Name [Specification] 1 W		А ЕС С
Connector No. F128 Connector Name FUEL INJECTOR No. 6 (WITH VK Connector Type HSIOZFGY MASOZFGY	Terminal Color Nuc. of Wire Signal Name [Specification]	Connector No. F211 Connector Name WIRE TO WIRE Connector Type RSO4F9-PR	Terminal Color Signal Name [Specification] Color Signal Name [Specification] Signal Name [Specification]		E F G
Connector No. F127 Connector Name FHSIZEGY Connector Type HSIZEGY MASS.	Terminal Color Signal Name [Specification]	Connector No. F151 Connector Name TCM (TRANSMISSION CONTROL MODULE) Connector Type SP10FG H.S. (1 2 3 4 5) (6 7 8 9 10)	Terminal Color Signal Name [Specification] No. of Wire Specification Signal Name [Specification] Signal Name [J K
IGINE CONTROL SYSTEM (VK50VE) ector Name Fuel INJECTOR No. 4 (WITH VK ECTOR Type HSQZEGV	Color	Nector No. F130 Nector Name FUEL INJECTOR No. 8 Nector Type HSSZFGY	Color Signal Name [Specification]		L M N
	[<u>p</u> _]	Oom Gom	<u> -</u>	JCBWM0706GB	Р

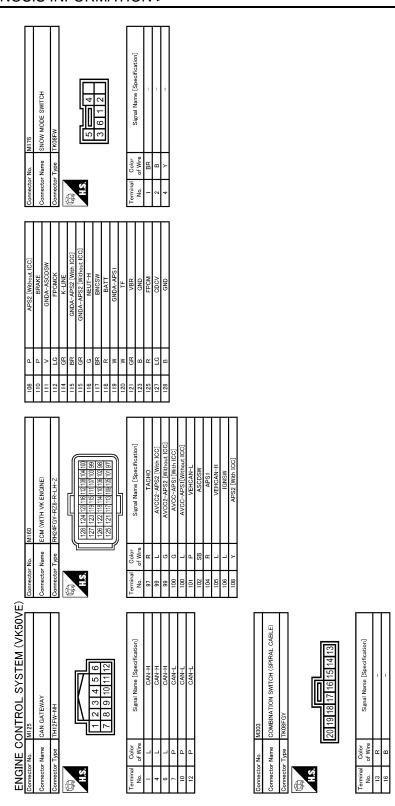
Revision: 2009 March EC-1165 2009 FX35/FX50



JCBWM0707GB

Connector No. M67 Connector Name UNIFIED METER AND A/C AMP. Connector Type TH32PW-NH L1.2 L1.2 L2.3 L3.3 L1.2 L3.3 L1.2 L3.3 L3	Terminal No. Of Wire Of Wire Signal Name [Specification] 100 of Wire Of	MI17 Connector No. MI17	A EC C
M66 Connector No. M66 Connector No. M66 Connector Name UNIFIED METER AND A/C AMP. Connector Type TH40FW-NH	Color Signal Name (Specification) No. of Wire Signal Name (Specification) 7 GR COMM (AMPNRETER) 14 BR COMM (AMPSMETER) 23 Y LG COMM (METER->AMP. 27 LG COMM (METER->AMP. 27 LG COMM (METER->AMP. 27 LG COMM (METER->LCD) 34 Y COMM (AMPLCD)	43 P	E F G
Connector No. M33	Terminal Color Signal Name [Specification] Color Col	Mile Connector No. Mile Connector No. Mile Connector Name WIRE TO WIRE Connector Type TX3BMP-NS10 Table Tile Ti	J K
ENGINE CONTROL SYSTEM (VK50VE) Connector No. M36 Connector Name COMBINATION SWITCH (SPIRAL CABLE) Connector Type TK08FGV-1V M31 22 26 31 32 33 34	Terminal Color Signal Name [Specification] 25 SB - -	Connector No. M108	M N O
			JCBWM0708GB Р

Revision: 2009 March **EC-1167** 2009 FX35/FX50



INFOID:000000003959052

JCBWM0709GB

NON DTC RELATED ITEM

Fail-safe

P2132 P2133 P2135

P0196

P0197

P0198

P0500

P0524

Engine oil temperature

Vehicle speed sensor

Engine oil pressure

sensor

[VK50VE]

0

Р

Engine opera		Detected iten	ns	Remarks	Reference page	
Engine speed will not rise more than 2,500 rpm due to the fuel cut Malfunction indicates lamp circuit		Malfunction indic	driver by illuminating MIL who system. Therefore, when electrical codiagnoses are continuously driver that engine control sys by means of operating the father fail-safe function also operating the father fail-safe function also operating the father fail-safe function also operating the father fail-safe function also operating the father fail-safe function also operating the father fail-safe function also operating the father fail-safe function also operating the father fail-safe function also operating the father	driver by illuminating MIL when there is malfunction on engine control		
OTC RELA	TED ITE	M				
DTC No.	Dete	ected items	Engine opera	ating condition in fail-safe mode		
U0113 U1003 U1024	Can comr	nunication circuit	VVEL actuator motor relay is turned off, and VVEL value is become at a minim Engine speed will not rise more than 3,500 rpm due to the fuel cut.			
P0011 P0021	Intake val	ve timing control	The signal is not energized to the intake valve timing control solenoid valve and the control does not function.			
P0014 P0024	Exhaust valve timing control		The signal is not energized to the exhaust valve timing control magnet retarder and the magnet retarder control does not function.			
P0102 P0103 P010C P010D	Mass air f	low sensor circuit	Engine speed will not rise more than 2,400 rpm due to the fuel cut.			
P0117 P0118	Engine coolant tempera- ture sensor circuit			determined by ECM based on the followir oolant temperature decided by ECM.	ng condition.	
			Condition	Engine coolant temperature dec (CONSULT-III display)		
				(CONSOLI-III display)	ided	
			Just as ignition switch is turned ON or START	40°C (104°F)	ided	
				, , , , , , , , , , , , , , , , , , , ,	ided	
			or START Approx. 4 minutes or more after	40°C (104°F)	ided	
			or START Approx. 4 minutes or more after engine starting Except as shown above	40°C (104°F) 80°C (176°F) 40 - 80°C (104 - 176°F) (Depends on the time) e coolant temperature sensor is activated.		

control does not function.

Exhaust valve timing control does not function.

The cooling fan operates (Highest) while engine is running.

Engine speed will not rise more than 2,400 rpm due to the fuel cut.

The signal is not energized to the intake valve timing control solenoid valve and the valve

< ECU DIAGNOSIS INFORMATION >

DTC No.	Detected items	Engine opera	ating condition in fail-safe mode			
P0605	ECM	(When ECM calculation function is malfunctioning:) ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring. ECM deactivates ASCD operation.				
P0607	ECM	VVEL actuator motor relay is turned Engine speed will not rise more that	d off, and VVEL value is become at a minimum angle an 3,500 rpm due to the fuel cut.			
P0643	Sensor power supply	ECM stops the electric throttle cont fixed opening (approx. 5 degrees) by	rol actuator control, throttle valve is maintained at a by the return spring.			
P1087 P1088	VVEL control function	VVEL of normal bank is controlled a Engine speed will not rise more that	•			
P1089 P1092	VVEL control shaft position sensor	VVEL value is maintained at a fixed angle. Engine speed will not rise more than 3,500 rpm due to the fuel cut				
P1608	VVEL control shaft position sensor	VVEL actuator motor relay is turned off, and VVEL value is become at a minimum angle Engine speed will not rise more than 3,500 rpm due to the fuel cut.				
P1090 P1093	VVEL actuator motor	VVEL of normal bank is controlled a Engine speed will not rise more that	<u> </u>			
		VVEL actuator motor relay is turned Engine speed will not rise more that	d off, and VVEL value is become at a minimum angle an 3,500 rpm due to the fuel cut.			
P1091	VVEL actuator motor relay	VVEL actuator motor relay is turned off, and VVEL value is become at a minimum angle Engine speed will not rise more than 3,500 rpm due to the fuel cut.				
P1233 P2101	Electric throttle control function	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.				
P1236 P2118	Throttle control motor	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.				
P1238 P2119	Electric throttle control actuator	(When electric throttle control actuator does not function properly due to the return spring malfunction:) ECM controls the electric throttle actuator by regulating the throttle opening around the idle position. The engine speed will not rise more than 2,000 rpm.				
			in fail-safe mode is not in specified range:) ontrol actuator because of regulating the throttle open			
		stops, the engine stalls.	ve is stuck open:) slows down gradually by fuel cut. After the vehicle position, and engine speed will not exceed 1,000 rpm			
P1290 P2100 P2103	Throttle control motor relay					
P1606	VVEL control module	VVEL actuator motor relay is turned Engine speed will not rise more that	d off, and VVEL value is become at a minimum angle an 3,500 rpm due to the fuel cut.			
P1805	Brake switch	ECM controls the electric throttle cosmall range. Therefore, acceleration will be poor	ontrol actuator by regulating the throttle opening to a r.			
		Vehicle condition	Driving condition			
		When engine is idling	Normal			
		When accelerating	Poor acceleration			
P2122 P2123 P2127 P2128 P2138	Accelerator pedal position sensor	The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. Therefore, the acceleration will be poor.				

DTC Inspection Priority Chart

INFOID:0000000003959053

If some DTCs are displayed at the same time, perform inspections one by one based on the following priority chart.

Priority	Detected items (DTC)				
1	U0101 CAN communication line				
	U0113 U1003 CAN communication line	0			
	U1001 CAN communication line	C			
	U1024 VVEL CAN communication line				
	P0101 P0102 P0103 P010B P010C P010D Mass air flow sensor				
	P0112 P0113 P0127 Intake air temperature sensor	D			
	P0116 P0117 P0118 P0125 Engine coolant temperature sensor				
	• P0122 P0123 P0222 P0223 P0227 P0228 P1225 P1226 P1234 P1235 P1239 P2132 P2133 P2135 Throttle position sensor				
	P0128 Thermostat function				
	P0181 P0182 P0183 Fuel tank temperature sensor	E			
	P0196 P0197 P0198 Engine oil temperature sensor				
	P0327 P0328 P0332 P0333 Knock sensor				
	P0335 Crankshaft position sensor				
	P0340 P0345 Camshaft position sensor	F			
	P0460 P0461 P0462 P0463 Fuel level sensor				
	P0500 Vehicle speed sensor				
	• P0605 P0607 ECM				
	P0643 Sensor power supply	G			
	P0705 P0850 Park/neutral position (PNP) switch				
	P1089 P1092 P1608 VVEL control shaft position sensor				
	P1220 Fuel pump control module (FPCM)	Н			
	P1550 P1551 P1552 P1553 P1554 Battery current sensor	- 11			
	P1606 P1607 VVEL control module				
	• P1610 - P1615 NATS				
	P1806 Brake booster pressure sensor	- 1			
	P2122 P2123 P2127 P2128 P2138 Accelerator pedal position sensor				

Revision: 2009 March **EC-1171** 2009 FX35/FX50

Κ

L

M

Ν

0

Priority	Detected items (DTC)
2	 P0031 P0032 P0051 P0052 Air fuel ratio (A/F) sensor 1 heater P0037 P0038 P0057 P0058 Heated oxygen sensor 2 heater P0075 P0081 Intake valve timing control solenoid valve P0078 P0084 Exhaust valve timing control solenoid valve P00130 P0131 P0132 P0133 P0150 P0151 P0152 P0153 P2A00 P2A03 Air fuel ratio (A/F) sensor 1 P0137 P0138 P0139 P0157 P0158 P0159 Heated oxygen sensor 2 P0441 EVAP control system purge flow monitoring P0443 P0444 P0445 EVAP canister purge volume control solenoid valve P0447 P0448 EVAP canister vent control valve P0451 P0452 P0453 EVAP control system pressure sensor P0550 Power steering pressure sensor P0603 ECM power supply P0710 P0717 P0720 P0729 P0730 P0731 P0732 P0733 P0734 P0735 P0740 P0744 P0745 P0750 P0775 P0780 P0795 P1730 P1734 P2713 P2722 P2731 P2807 A/T related sensors, solenoid valves and switches P1087 P1088 Exhaust valve timing control position sensor P1087 P1088 VVEL system P1090 P1093 VVEL actuator motor P1091 VVEL actuator motor relay P1217 Engine over temperature (OVERHEAT) P1233 P2101 Electric throttle control function P1236 P2118 Throttle control motor P1290 P2100 P2103 Throttle control motor relay P1805 Brake switch
3	 P0011 P0021 Intake valve timing control P0014 P0024 Exhaust valve timing control P0171 P0172 P0174 P0175 Fuel injection system function P0225 Electric throttle control actuator P0300 - P0308 Misfire P0420 P0430 Three way catalyst function P0442 EVAP control system (SMALL LEAK) P0455 EVAP control system (GROSS LEAK) P0456 EVAP control system (VERY SMALL LEAK) P0506 P0507 Idle speed control system P0524 Engine oil pressure P100A P100B VVEL system P1148 P1168 Closed loop control P1211 TCS control unit P1212 TCS communication line P1238 P2119 Electric throttle control actuator P1421 Cold start control P1564 ASCD steering switch / ICC steering switch P1578 ASCD vehicle speed sensor / ICC vehicle speed sensor P15715 Input speed sensor

DTC Index

 \times :Applicable —: Not applicable

DTC*1		Items				Reference
CONSULT-III GST* ²	ECM*3	(CONSULT-III screen terms)	SRT code	Trip	MIL	page
U0101	0101	LOST COMM (TCM)	_	1	×	EC-742
U0113	0113	CAN COMM CIRCUIT	_	1	×	EC-743
U1001	1001*4	CAN COMM CIRCUIT	_	2 (with ASCD) 1 or 2 (with ICC)	_	EC-745
U1003	1003	CAN COMM CIRCUIT	_	2	_	EC-743
U1024	1024	VVEL CAN COMM CIRCUIT	_	1	×	EC-746

DTC	_* *1	Items				Reference
CONSULT-III GST* ²	ECM*3	(CONSULT-III screen terms)	SRT code	Trip	MIL	page
P0000	0000	NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED.	_	_	Blinking* ⁷	_
P0011	0011	INT/V TIM CONT-B1	_	2	×	EC-748
P0014	0014	EXH/V TIM CONT-B1	_	2	×	EC-752
P0021	0021	INT/V TIM CONT-B2	_	2	×	EC-748
P0024	0024	EXH/V TIM CONT-B2	_	2	×	EC-752
P0031	0031	A/F SEN1 HTR (B1)	_	2	×	EC-756
P0032	0032	A/F SEN1 HTR (B1)	_	2	×	EC-756
P0037	0037	HO2S2 HTR (B1)	_	2	×	EC-759
P0038	0038	HO2S2 HTR (B1)	_	2	×	EC-759
P0051	0051	A/F SEN1 HTR (B2)	_	2	×	EC-756
P0052	0052	A/F SEN1 HTR (B2)	_	2	×	EC-756
P0057	0057	HO2S2 HTR (B2)	_	2	×	EC-759
P0058	0058	HO2S2 HTR (B2)	_	2	×	EC-759
P0075	0075	INT/V TIM V/CIR-B1	_	2	×	EC-762
P0078	P0078 0078 EX V/T ACT/CIRC-B1		_	2	×	EC-765
P0081	0081	INT/V TIM V/CIR-B2	_	2	×	EC-762
P0084	0084	EX V/T ACT/CIRC-B2	_	2	×	EC-765
P0101	0101	MAF SEN/CIRCUIT-B1	_	2	×	EC-768
P0102	0102	MAF SEN/CIRCUIT-B1	_	1	×	EC-775
P0103	0103	MAF SEN/CIRCUIT-B1	_	1	×	EC-775
P010B	010B	MAF SEN/CIRCUIT-B2	_	2	×	EC-768
P010C	010C	MAF SEN/CIRCUIT-B2	_	1	×	EC-775
P010D	010D	MAF SEN/CIRCUIT-B2	_	1	×	EC-775
P0112	0112	IAT SEN/CIRCUIT-B1	_	2	×	EC-781
P0113	0113	IAT SEN/CIRCUIT-B1	_	2	×	EC-781
P0116	0116	ECT SEN/CIRC		2	×	EC-784
P0117	0117	ECT SEN/CIRC	_	1	×	EC-786
P0118	0118	ECT SEN/CIRC	_	1	×	EC-786
P0122	0122	TP SEN 2/CIRC-B1		1	×	EC-789
P0123	0123	TP SEN 2/CIRC-B1	_	1	×	EC-789
P0125	0125	ECT SENSOR	_	2	×	EC-792
P0127	0127	IAT SENSOR-B1	_	2	×	EC-795
P0128	0128	THERMSTAT FNCTN	_	2	×	EC-797
P0130	0130	A/F SENSOR1 (B1)	_	2	×	EC-799
P0131	0131	A/F SENSOR1 (B1)	_	2	×	EC-803
P0132	0132	A/F SENSOR1 (B1)	_	2	×	EC-806
P0133	0133	A/F SENSOR1 (B1)	×	2	×	EC-809
P0137	0137	HO2S2 (B1)	×	2	×	EC-814
P0138	0138	HO2S2 (B1)	×	2	×	EC-820
P0139	0139	HO2S2 (B1)	×	2	×	EC-828
P0150	0150	A/F SENSOR1 (B2)	_	2	×	EC-799

DTC	*1					5 /
CONSULT-III GST* ²	ECM* ³	Items (CONSULT-III screen terms)	SRT code	Trip	MIL	Reference page
P0151	0151	A/F SENSOR1 (B2)	_	2	×	EC-803
P0152	0152	A/F SENSOR1 (B2)	_	2	×	EC-806
P0153	0153	A/F SENSOR1 (B2)	×	2	×	EC-809
P0157	0157	HO2S2 (B2)	×	2	×	EC-814
P0158	0158	HO2S2 (B2)	×	2	×	EC-820
P0159	0159	HO2S2 (B2)	×	2	×	EC-828
P0171	0171	FUEL SYS-LEAN-B1	_	2	×	EC-834
P0172	0172	FUEL SYS-RICH-B1	_	2	×	EC-838
P0174	0174	FUEL SYS-LEAN-B2	_	2	×	EC-834
P0175	0175	FUEL SYS-RICH-B2	_	2	×	EC-838
P0181	0181	FTT SENSOR	_	2	×	EC-842
P0182	0182	FTT SEN/CIRCUIT	_	2	×	EC-845
P0183	0183	FTT SEN/CIRCUIT	_	2	×	EC-845
P0196	0196	EOT SENSOR	_	2	×	EC-848
P0197	0197	EOT SEN/CIRC	_	2	×	EC-851
P0198	0198	EOT SEN/CIRC	_	2	×	EC-851
P0222	0222	TP SEN 1/CIRC-B1	_	1	×	EC-854
P0223	0223	TP SEN 1/CIRC-B1	_	1	×	EC-854
P0225	0225	CTP LEARNING-B2	_	2	×	EC-857
P0227	0227	TP SEN 2/CIRC-B2	_	1	×	EC-789
P0228	0228	TP SEN 2/CIRC-B2	_	1	×	EC-789
P0300	0300	MULTI CYL MISFIRE	_	1 or 2	×	EC-858
P0301	0301	CYL 1 MISFIRE	_	1 or 2	×	EC-858
P0302	0302	CYL 2 MISFIRE	_	1 or 2	×	EC-858
P0303	0303	CYL 3 MISFIRE	_	1 or 2	×	EC-858
P0304	0304	CYL 4 MISFIRE	_	1 or 2	×	EC-858
P0305	0305	CYL 5 MISFIRE	_	1 or 2	×	EC-858
P0306	0306	CYL 6 MISFIRE	_	1 or 2	×	EC-858
P0307	0307	CYL 7 MISFIRE	_	1 or 2	×	EC-858
P0308	0308	CYL 8 MISFIRE	_	1 or 2	×	EC-858
P0327	0327	KNOCK SEN/CIRC-B1	_	2	_	EC-864
P0328	0328	KNOCK SEN/CIRC-B1	_	2	_	EC-864
P0332	0332	KNOCK SEN/CIRC-B2	_	2	_	EC-864
P0333	0333	KNOCK SEN/CIRC-B2	_	2	_	EC-864
P0335	0335	CKP SEN/CIRCUIT	_	2	×	EC-867
P0340	0340	CMP SEN/CIRC-B1	_	2	×	EC-871
P0345	0345	CMP SEN/CIRC-B2	_	2	×	EC-871
P0420	0420	TW CATALYST SYS-B1	×	2	×	EC-877
P0430	0430	TW CATALYST SYS-B2	×	2	×	EC-877
P0441	0441	EVAP PURG FLOW/MON	×	2	×	EC-882
P0442	0442	EVAP SMALL LEAK	×	2	×	EC-887
P0443	0443	PURG VOLUME CONT/V	_	2	×	EC-893

DTC	C*1	Itama				Deference
CONSULT-III GST* ²	ECM*3	Items (CONSULT-III screen terms)	SRT code	Trip	MIL	Reference page
P0444	0444	PURG VOLUME CONT/V	_	2	×	EC-898
P0445	0445	PURG VOLUME CONT/V	_	2	×	EC-898
P0447	0447	VENT CONTROL VALVE	_	2	×	EC-901
P0448	0448	VENT CONTROL VALVE	_	2	×	EC-905
P0451	0451	EVAP SYS PRES SEN	_	2	×	EC-909
P0452	0452	EVAP SYS PRES SEN	_	2	×	EC-912
P0453	0453	EVAP SYS PRES SEN	_	2	×	EC-917
P0455	0455	EVAP GROSS LEAK	_	2	×	EC-923
P0456	0456	EVAP VERY SML LEAK	×* ⁶	2	×	EC-929
P0460	0460	FUEL LEV SEN SLOSH	_	2	×	EC-936
P0461	0461	FUEL LEVEL SENSOR	_	2	×	EC-938
P0462	0462	FUEL LEVL SEN/CIRC	_	2	×	EC-940
P0463	0463	FUEL LEVL SEN/CIRC	_	2	×	EC-940
P0500	0500	VEH SPEED SEN/CIRC*5		2	×	EC-942
P0506	0506	ISC SYSTEM	_	2	×	EC-944
P0507	0507	ISC SYSTEM	_	2	×	EC-946
P0524	0524	ENGINE OIL PRESSURE	_	2	×	EC-948
P0550	0550	PW ST P SEN/CIRC	_	2	_	EC-951
P0603	0603	ECM BACK UP/CIRCUIT	_	2	×	EC-954
P0605	0605	ECM	_	1 or 2	× or —	EC-956
P0607	0607	ECM	_	1	×	EC-958
P0643	0643	SENSOR POWER/CIRC	_	1	×	EC-959
P0705	0705	T/M RANGE SENSOR A	_	2	×	TM-273
P0710	0710	FLUID TEMP SENSOR*8		2	×	TM-274
P0717	0717	INPUT SPEED SENSOR A	_	2	×	TM-276
P0720	0720	OUTPUT SPEED SENSOR*5	_	2	×	TM-278
P0729	0729	6GR INCORRECT RATIO*8	_	2	×	TM-282
	0729	INCORRECT GR RATIO		2		
P0730				2	×	TM-284
P0731	0731	1GR INCORRECT RATIO*8	_		×	<u>TM-285</u>
P0732	0732	2GR INCORRECT RATIO*8	_	2	×	<u>TM-287</u>
P0733	0733	3GR INCORRECT RATIO*8		2	×	<u>TM-289</u>
P0734	0734	4GR INCORRECT RATIO*8	_	2	×	TM-291
P0735	0735	5GR INCORRECT RATIO*8	_	2	×	TM-293
P0740	0740	TORQUE CONVERTER	_	2	×	TM-295
P0744	0744	TORQUE CONVERTER	_	2	×	TM-297
P0745	0745	PC SOLENOID A	_	2	×	TM-298
P0750	0750	SHIFT SOLENOID A	_	2	×	TM-299
P0775	0775	PC SOLENOID B	_	2	×	<u>TM-300</u>
P0780	0780	SHIFT	_	1	×	<u>TM-301</u>
P0795	0795	PC SOLENOID C	_	2	×	TM-302
P0850	0850	P-N POS SW/CIRCUIT	_	2	×	EC-962

₹ ECU DIAGI	NOSIS INF	ORMATION >		[VK30VL]		
DTO	C* ¹					
CONSULT-III GST* ²	ECM*3	ltems (CONSULT-III screen terms)	SRT code	Trip	MIL	Reference page
P100A	100A	VVEL SYSTEM-B1	_	2	×	EC-965
P100B	100B	VVEL SYSTEM-B2	_	2	×	EC-965
P1078	1078	EXH TIM SEN/CIRC-B1	_	2	×	EC-969
P1084	1084	EXH TIM SEN/CIRC-B2	_	2	×	EC-969
P1087	1087	VVEL SYSTEM-B1	_	1	×	EC-974
P1088	1088	VVEL SYSTEM-B2	_	1	×	EC-974
P1089	1089	VVEL POS SEN/CIRC-B1	_	1	×	EC-975
P1090	1090	VVEL ACTR MOT-B1	_	1	×	EC-979
P1091	1091	VVEL ACTR MOT PWR	_	1 or 2	×	EC-983
P1092	1092	VVEL POS SEN/CIRC-B2	_	1	×	EC-975
P1093	1093	VVEL ACTR MOT-B2	_	1	×	EC-979
P1148	1148	CLOSED LOOP-B1	_	1	×	EC-986
P1168	1168	CLOSED LOOP-B2	_	1	×	EC-986
P1211	1211	TCS C/U FUNCTN	_	2	_	EC-987
P1212	1212	TCS/CIRC	_	2	_	EC-988
P1217	1217	ENG OVER TEMP	_	1	×	EC-989
P1220	1220	FPCM	_	1	_	EC-993
P1225	1225	CTP LEARNING-B1	_	2	_	EC-996
P1226	1226	CTP LEARNING-B1	_	2	_	EC-998
P1233	1233	ETC FNCTN/CIRC-B2	_	1	×	EC-1000
P1234	1234	CTP LEARNING-B2	_	2	_	EC-996
P1235	1235	CTP LEARNING-B2	_	2	_	EC-998
P1236	1236	ETC MOT-B2	_	1	×	EC-1004
P1238	1238	ETC ACTR-B2	_	1	×	EC-1007
P1239	1239	TP SENSOR-B2	_	1	×	EC-1009
P1290	1290	ETC MOT PWR-B2	_	1	×	EC-1012
P1421	1421	COLD START CONTROL	_	2	×	EC-1014
P1550	1550	BAT CURRENT SENSOR	_	2	_	EC-1016
P1551	1551	BAT CURRENT SENSOR	_	2	_	EC-1020
P1552	1552	BAT CURRENT SENSOR	_	2	_	EC-1020
P1553	1553	BAT CURRENT SENSOR	_	2	_	EC-1025
P1554	1554	BAT CURRENT SENSOR	_	2	_	EC-1029
P1564	1564	ASCD SW	_	1	_	EC-1034 (with ASCD) EC-1037 (with ICC)
P1568	1568	ICC COMMAND VALUE	_	1	_	EC-1040
P1572	1572	ASCD BRAKE SW	_	1	_	EC-1041 (with ASCD) EC-1046 (with ICC)
P1574	1574	ASCD VHL SPD SEN	_	1	_	EC-1052 (with ASCD) EC-1054 (with ICC)

Α

D

Е

DTC	C* ¹	16				D
CONSULT-III GST* ²	ECM*3	Items (CONSULT-III screen terms)	SRT code	Trip	MIL	Reference page
P1606	1606	VVEL CONTROL MODULE	_	1 or 2	× or —	EC-1056
P1607	1607	VVEL CONTROL MODULE	_	1	×	EC-1058
P1608	1608	VVEL SENSOR POWER/CIRC	_	1	×	EC-1060
P1610	1610	LOCK MODE	_	2	_	SEC-34
P1611	1611	ID DISCORD IMMU-ECM	_	2	_	SEC-35
P1612	1612	CHAIN OF ECM-IMMU	_	2	_	SEC-37
P1614	1614	CHAIN OF IMMU-KEY	_	2	_	SEC-38
P1615	1615	DIFFERENCE OF KEY	_	2	_	SEC-41
P1715	1715	IN PULY SPEED	_	2	_	EC-1063
P1730	1730	INTERLOCK	_	2	×	TM-307
P1734	1734	7GR INCORRECT RATIO*8	_	2	×	TM-309
P1805	1805	BRAKE SW/CIRCUIT	_	2	_	EC-1064
P1806	1806	BRAKE BSTR PRES SEN/CIRC	_	2	×	BRC-93
P2100	2100	ETC MOT PWR-B1	_	1	×	EC-1012
P2101	2101	ETC FNCTN/CIRC-B1	_	1	×	EC-1000
P2103	2103	ETC MOT PWR	_	1	×	EC-1012
P2118	2118	ETC MOT-B1	_	1	×	EC-1004
P2119	2119	ETC ACTR-B1	_	1	×	EC-1007
P2122	2122	APP SEN 1/CIRC	_	1	×	EC-1067
P2123	2123	APP SEN 1/CIRC	_	1	×	EC-1067
P2127	2127	APP SEN 2/CIRC	_	1	×	EC-1071
P2128	2128	APP SEN 2/CIRC	_	1	×	EC-1071
P2132	2132	TP SEN 1/CIRC-B2	_	1	×	EC-854
P2133	2133	TP SEN 1/CIRC-B2	_	1	×	EC-854
P2135	2135	TP SENSOR-B1	_	1	×	EC-1009
P2138	2138	APP SENSOR	_	1	×	EC-1076
P2713	2713	PRESS CONTROL SOL D	_	2	×	<u>TM-317</u>
P2722	2722	PRESS CONTROL SOL E	_	2	×	<u>TM-318</u>
P2731	2731	PRESS CONTROL SOL F	_	2	×	<u>TM-319</u>
P2807	2807	PRESS CONTROL SOL G	_	2	×	<u>TM-320</u>
P2A00	2A00	A/F SENSOR1 (B1)	_	2	×	EC-1081
P2A03	2A03	A/F SENSOR1 (B2)	_	2	×	EC-1081

^{*1: 1}st trip DTC No. is the same as DTC No.

How to Set SRT Code

INFOID:0000000003959055

Ν

Р

To set all SRT codes, self-diagnosis for the items indicated above must be performed one or more times. Each diagnosis may require a long period of actual driving under various conditions.

^{*2:} This number is prescribed by SAE J2012.

^{*3:} In Diagnostic Test Mode II (Self-diagnostic results), this number is controlled by NISSAN.

^{*4:} The troubleshooting for this DTC needs CONSULT-III.

^{*5:} When the fail safe operations for both self-diagnoses occur, the MIL illuminates.

^{*6:} SRT code will not be set if the self-diagnostic result is NG.

^{*7:} When the ECM is in the mode that displays SRT status, MIL may blink. For the details, refer to "How to Display SRT Status".

^{*8:} When erasing this DTC, always use CONSULT-III or GST.

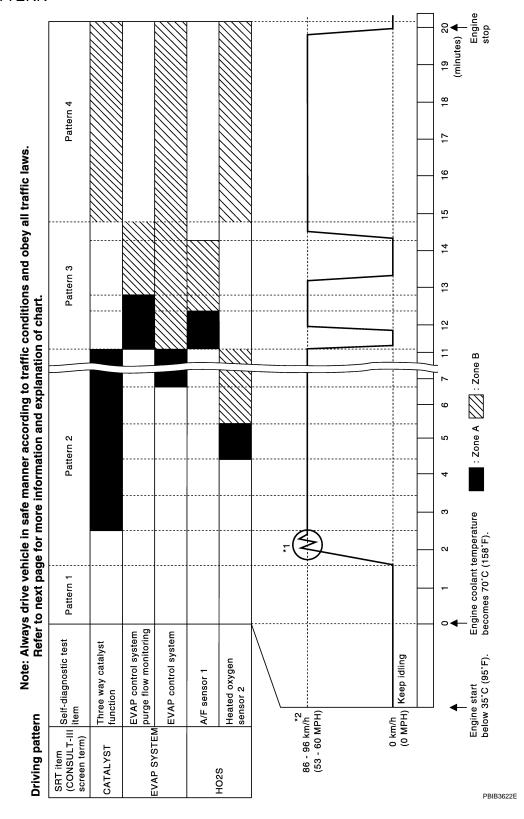
(P) WITH CONSULT-III

Perform corresponding DTC Confirmation Procedure one by one based on Performance Priority in the table on "SRT Item".

⋈ WITHOUT CONSULT-III

The most efficient driving pattern in which SRT codes can be properly set is explained below. The driving pattern should be performed one or more times to set all SRT codes.

DRIVING PATTERN



• The time required for each diagnosis varies with road surface conditions, weather, altitude, individual driving habits, etc.

Zone A refers to the range where the time, required for the diagnosis under normal conditions*, is the shortest.

Zone B refers to the range where the diagnosis can still be performed if the diagnosis is not completed within zone A.

- *: Normal conditions refer to the following:
- Sea level
- Flat road
- Ambient air temperature: 20 30°C (68 86°F)
- Diagnosis is performed as quickly as possible under normal conditions.
 Under different conditions [For example: ambient air temperature other than 20 30°C (68 86°F)], diagnosis may also be performed.

Pattern 1:

- The engine is started at the engine coolant temperature of -10 to 35°C (14 to 95°F)
 [where the voltage between the ECM terminals 24 (engine coolant temperature sensor signal) and 23
 (sensor ground) is 3.0 4.3 V].
- The engine must be operated at idle speed until the engine coolant temperature is greater than 70°C (158°F) [where the voltage between the ECM terminals 24 (engine coolant temperature sensor signal) and 23 (sensor ground) is lower than 1.4 V].
- The engine is started at the fuel tank temperature of warmer than 0°C (32°F) (where the voltage between the ECM terminal 120 (fuel tank temperature sensor signal) and ground is less than 4.1 V). Pattern 2:
- When steady-state driving is performed again even after it is interrupted, each diagnosis can be conducted. In this case, the time required for diagnosis may be extended.

Pattern 3:

- Operate vehicle following the driving pattern shown in the figure.
- Release the accelerator pedal during deceleration of vehicle speed from 90 km/h (56 MPH) to 0 km/h (0 MPH).

Pattern 4:

- The accelerator pedal must be held very steady during steadystate driving.
- If the accelerator pedal is moved, the test must be conducted again.
- *1: Depress the accelerator pedal until vehicle speed is 90 km/h (56 MPH), then release the accelerator pedal and keep it released for more than 10 seconds. Depress the accelerator pedal until vehicle speed is 90 km/h (56 MPH) again.



Suggested Transmission Gear Position for A/T Models

Set the selector lever position in the D with the overdrive switch turned ON.

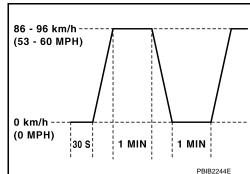


The following is the information specified in Service \$06 of SAE J1979.

The test value is a parameter used to determine whether a system/circuit diagnostic test is OK or NG while being monitored by the ECM during self-diagnosis. The test limit is a reference value which is specified as the maximum or minimum value and is compared with the test value being monitored.

These data (test value and test limit) are specified by On Board Monitor ID(OBDMID), Test ID (TID), Unit and Scaling ID and can be displayed on the GST screen.

The items of the test value and test limit will be displayed with GST screen which items are provided by the ECM. (eg., if bank 2 is not applied on this vehicle, only the items of bank 1 are displayed)



EC

Α

С

D

Н

. .

J

K

L

INFOID:0000000003959056

Ν

0

Item	OBD-	Self-diagnostic test item	DTC	li	e and Test mit display)	Description	
пеш	MID	Sell-diagnostic test item	DIC	TID	Unit and Scaling ID	Description	
			P0131	83H	0BH	Minimum sensor output voltage for te cycle	
			P0131	84H	0BH	Maximum sensor output voltage for te	
			P0130	85H	0BH	Minimum sensor output voltage for te cycle	
		Air fuel ratio (A/F) sensor 1	P0130	86H	0BH	Maximum sensor output voltage for te	
	01H	(Bank 1)	P0133	87H	04H	Response rate: Response ratio (Lean Rich)	
			P0133	88H	04H	Response rate: Response ratio (Rich Lean)	
			P2A00	89H	84H	The amount of shift in air fuel ratio	
			P2A00	8AH	84H	The amount of shift in air fuel ratio	
HO2S			P0130	8BH	0BH	Difference in sensor output voltage	
			P0133	8CH	83H	Response gain at the limited frequer	
			P0138	07H	0CH	Minimum sensor output voltage for te	
	02H	Heated oxygen sensor 2 (Bank 1)	P0137	08H	0CH	Maximum sensor output voltage for to cycle	
			P0138	80H	0CH	Sensor output voltage	
			P0139	81H	0CH	Difference in sensor output voltage	
		Heated oxygen sensor 3 (Bank 1)	P0143	07H	0CH	Minimum sensor output voltage for to cycle	
	03H		P0144	08H	0CH	Maximum sensor output voltage for to cycle	
			P0146	80H	0CH	Sensor output voltage	
			P0145	81H	0CH	Difference in sensor output voltage	

Jan OBD		Self-diagnostic test item		li	e and Test mit display)		A
Item	MID	Self-diagnostic test item	DTC	TID	Unitand Scaling ID	Description	E
			P0151	83H	0BH	Minimum sensor output voltage for test cycle	
			P0151	84H	0BH	Maximum sensor output voltage for test cycle	
			P0150	85H	0BH	Minimum sensor output voltage for test cycle	
		Air fuel ratio (A/F) sensor 1	P0150	86H	0BH	Maximum sensor output voltage for test cycle	[
	05H	(Bank 2)	P0153	87H	04H	Response rate: Response ratio (Lean to Rich)	L
			P0153	88H	04H	Response rate: Response ratio (Rich to Lean)	
	028		P2A03	89H	84H	The amount of shift in air fuel ratio	
			P2A03	8AH	84H	The amount of shift in air fuel ratio	
HO2S			P0150	8BH	0BH	Difference in sensor output voltage	
		P0153	8CH	83H	Response gain at the limited frequency		
			P0158	07H	0CH	Minimum sensor output voltage for test cycle	
	06H	Heated oxygen sensor 2 (Bank 2)	P0157	08H	0CH	Maximum sensor output voltage for test cycle	
			P0158	80H	0CH	Sensor output voltage	
			P0159	81H	0CH	Difference in sensor output voltage	
			P0163	07H	0CH	Minimum sensor output voltage for test cycle	
	07H	Heated oxygen sensor 3 (Bank2)	P0164	08H	0CH	Maximum sensor output voltage for test cycle	
		·	P0166	80H	0CH	Sensor output voltage	
			P0165	81H	0CH	Difference in sensor output voltage	
			P0420	80H	01H	O2 storage index	
	24⊔	Three way catalyst function	P0420	82H	01H	Switching time lag engine exhaust index value	
	21H	(Bank1)	P2423	83H	0CH	Difference in 3rd O2 sensor output voltage	
CATA-			P2423	84H	84H	O2 storage index in HC trap catalyst	
YST			P0430	80H	01H	O2 storage index	
	224	Three way catalyst function	P0430	82H	01H	Switching time lag engine exhaust index value	
	22H	(Bank2)	P2424	83H	0CH	Difference in 3rd O2 sensor output voltage	
			P2424	84H	84H	O2 storage index in HC trap catalyst	

			ECM			5,4750,751
< ECU D	IAGNO	OSIS INFORMATION >				[VK50VE]
	000			li	e and Test mit display)	
Item	OBD- MID	Self-diagnostic test item	DTC	TID	Unit and Scaling ID	Description
			P0400	80H	96H	Low Flow Faults: EGR temp change rate (short term)
			P0400	81H	96H	Low Flow Faults: EGR temp change rate (long term)
EGR SYSTEM	31H	EGR function	P0400	82H	96H	Low Flow Faults: Difference between max EGR temp and EGR temp under idling condition
			P0400	83H	96H	Low Flow Faults: Max EGR temp
			P1402	84H	96H	High Flow Faults: EGR temp increase rate
			P0011	80H	9DH	VTC intake function diagnosis (VTC alignment check diagnosis)
	35H	VVT Monitor (Bank1)	P0014	81H	9DH	VTC exhaust function diagnosis (VTC alignment check diagnosis)
			P0011	82H	9DH	VTC intake function diagnosis (VTC drive failure diagnosis)
VVT			P0014	83H	9DH	VTC exhaust function diagnosis (VTC drive failure diagnosis)
SYSTEM			P0021	80H	9DH	VTC intake function diagnosis (VTC alignment check diagnosis)
	36H	VVT Monitor (Bank2)	P0024	81H	9DH	VTC exhaust function diagnosis (VTC alignment check diagnosis)
			P0021	82H	9DH	VTC intake function diagnosis (VTC drive failure diagnosis)
			P0024	83H	9DH	VTC exhaust function diagnosis (VTC drive failure diagnosis)
	39H	EVAP control system leak (Cap Off)	P0455	80H	0CH	Difference in pressure sensor output voltage before and after pull down
·	3ВН	EVAP control system leak (Small leak)	P0442	80H	05H	Leak area index (for more than 0.04 inch)
EVAP SYSTEM	зсн	EVAP control system leak	P0456	80H	05H	Leak area index (for more than 0.02 inch)
	0011	(Very small leak)	P0456	81H	FDH	Maximum internal pressure of EVAP system during monitoring
	3DH	Purge flow system	P0441	83H	0CH	Difference in pressure sensor output voltage before and after vent control valve close
	41H	A/F sensor 1 heater (Bank 1)	Low Input:P0031 High Input:P0032	81H	0BH	Converted value of Heater electric current to voltage
	42H	Heated oxygen sensor 2 heater (Bank 1)	Low Input:P0037 High Input:P0038	80H	0CH	Converted value of Heater electric current to voltage
O2 SEN- SOR	43H	Heated oxygen sensor 3 heater (Bank 1)	P0043	80H	0CH	Converted value of Heater electric current to voltage
HEATER	45H	A/F sensor 1 heater (Bank 2)	Low Input:P0051 High Input:P0052	81H	0BH	Converted value of Heater electric current to voltage
	46H	Heated oxygen sensor 2 heater (Bank 2)	Low Input:P0057 High Input:P0058	80H	0CH	Converted value of Heater electric current to voltage
	47H	Heated oxygen sensor 3 heater (Bank 2)	P0063	80H	0CH	Converted value of Heater electric current to voltage

Item	OBD-	Solf diagnostic test item	DTC _	li	e and Test mit display)	Description
MID	MID	Self-diagnostic test item	ыс	TID	Unitand Scaling ID	Description
		Secondary Air system	P0411	80H	01H	Secondary Air Injection System Incor- rect Flow Detected
			Bank1: P0491 Bank2: P0492	81H	01H	Secondary Air Injection System Insufficient Flow
			P2445	82H	01H	Secondary Air Injection System Pump Stuck Off
SEC- OND- ARY AIR	71H		P2448	83H	01H	Secondary Air Injection System High Airflow
7.11.17.11.1			Bank1: P2440 Bank2: P2442	84H	01H	Secondary Air Injection System Switching Valve Stuck Open
			P2440	85H	01H	Secondary Air Injection System Switching Valve Stuck Open
			P2444	86H	01H	Secondary Air Injection System Pump Stuck On
	81H	Fuel injection system function	P0171 or P0172	80H	2FH	Long term fuel trim
FUEL 81	оіп	(Bank 1)	P0171 or P0172	81H	24H	The number of lambda control clamped
SYSTEM	82H	Fuel injection system function	P0174 or P0175	80H	2FH	Long term fuel trim
8	02Π	(Bank 2)	P0174 or P0175	81H	24H	The number of lambda control clamped

K

L

 \mathbb{N}

Ν

0

ECO D	IAGING	OSIS INFORMATION >				[VK30VE
				lii	e and Test mit	
Item	OBD- MID	Self-diagnostic test item	DTC	TID	Unitand Scaling ID	Description
			P0301	80H	24H	Misfiring counter at 1000 revolution of the first cylinder
			P0302	81H	24H	Misfiring counter at 1000 revolution of the second cylinder
			P0303	82H	24H	Misfiring counter at 1000 revolution of the third cylinder
			P0304	83H	24H	Misfiring counter at 1000 revolution of the fourth cylinder
			P0305	84H	24H	Misfiring counter at 1000 revolution of the fifth cylinder
			P0306	85H	24H	Misfiring counter at 1000 revolution of the sixth cylinder
		Multiple Cylinder Misfires	P0307	86H	24H	Misfiring counter at 1000 revolution of the seventh cylinder
			P0308	87H	24H	Misfiring counter at 1000 revolution of the eighth cylinder
			P0300	88H	24H	Misfiring counter at 1000 revolution of the multiple cylinders
MICEIDE	A4LI		P0301	89H	24H	Misfiring counter at 200 revolution of th first cylinder
MISFIRE	A1H		P0302	8AH	24H	Misfiring counter at 200 revolution of the second cylinder
			P0303	8BH	24H	Misfiring counter at 200 revolution of the third cylinder
			P0304	8CH	24H	Misfiring counter at 200 revolution of th fourth cylinder
			P0305	8DH	24H	Misfiring counter at 200 revolution of the fifth cylinder
			P0306	8EH	24H	Misfiring counter at 200 revolution of the sixth cylinder
			P0307	8FH	24H	Misfiring counter at 200 revolution of the seventh cylinder
			P0308	90H	24H	Misfiring counter at 200 revolution of the eighth cylinder
			P0300	91H	24H	Misfiring counter at 1000 revolution of the single cylinder
			P0300	92H	24H	Misfiring counter at 200 revolution of the single cylinder
			P0300	93H	24H	Misfiring counter at 200 revolution of the multiple cylinders

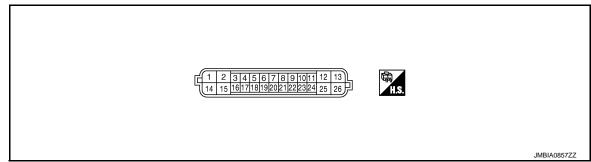
	OBD-	0.16.15	DTO	li	e and Test mit display)	D i Vi
Item	MID	Self-diagnostic test item	DTC	TID	Unitand Scaling ID	Description
	A2H	No. 1 Cylinder Misfire	P0301	овн	24H	EWMA (Exponential Weighted Moving Average) misfire counts for last 10 driving cycles
			P0301	0CH	24H	Misfire counts for last/current driving cycles
	АЗН	No. 2 Cylinder Misfire	P0302	ОВН	24H	EWMA (Exponential Weighted Moving Average) misfire counts for last 10 driving cycles
			P0302	0CH	24H	Misfire counts for last/current driving cycles
A4H	A4H	H No. 3 Cylinder Misfire	P0303	ОВН	24H	EWMA (Exponential Weighted Moving Average) misfire counts for last 10 driving cycles
			P0303	0CH	24H	Misfire counts for last/current driving cycles
	A5H	No. 4 Cylinder Misfire	P0304	овн	24H	EWMA (Exponential Weighted Moving Average) misfire counts for last 10 driving cycles
			P0304	0CH	24H	Misfire counts for last/current driving cycles
MISFIRE	A6H	No. 5 Cylinder Misfire	P0305	овн	24H	EWMA (Exponential Weighted Moving Average) misfire counts for last 10 driv- ing cycles
			P0305	0CH	24H	Misfire counts for last/current driving cycles
	А7Н	No. 6 Cylinder Misfire	P0306	овн	24H	EWMA (Exponential Weighted Moving Average) misfire counts for last 10 driving cycles
			P0306	0CH	24H	Misfire counts for last/current driving cycles
	A8H	No. 7 Cylinder Misfire	P0307	овн	24H	EWMA (Exponential Weighted Moving Average) misfire counts for last 10 driving cycles
		,	P0307	0CH	24H	Misfire counts for last/current driving cycles
	А9Н	No. 8 Cylinder Misfire	P0308	овн	24H	EWMA (Exponential Weighted Moving Average) misfire counts for last 10 driving cycles
			P0308	0CH	24H	Misfire counts for last/current driving cycles

Н

VVEL CONTROL MODULE

Reference Value

TERMINAL LAYOUT



PHYSICAL VALUES

NOTE:

- VVEL control module is located behind the IPDM E/R. For this inspection, remove hoodledge cover (RH).
- Specification data are reference values and are measured between each terminals.
- Pulse signal is measured by CONSULT-III.

Termi	nal No.	Description			Value
+	_	Signal name	Input/ Output	Condition	(Approx.)
1 (W)	14 (B)	VVEL actuator motor power supply (bank 2)	Input	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14V)
2		VVEL actuator motor	Output	[Engine is running]Warm-up conditionIdle speed	0 - 14 V★ 100μSec/div 5V/div JMBIA0854ZZ
(BR)	(B)	(High lift) (bank 2)		[Engine is running]Warm-up conditionWhen revving engine up to 2,000 rpm quickly	0 - 14 V★ 100μSec/div 5V/div JMBIA0855ZZ
3	6	VVEL control shaft position		[Engine is running]Warm-up conditionIdle speed	0.25 - 1.40 V
(R)	(B)	sensor 1 (bank 1)	Input	[Engine is running]Warm-up conditionWhen revving engine up to 3,000 rpm quickly	0.25 - 4.75 V
4 (B)	_	Sensor ground [VVEL control shaft position sensor 1 (bank 2)]	_	_	_

VVEL CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[VK50VE]

Terminal No.		Description			Value	Δ.
+	_	Signal name	Input/ Output	Condition	(Approx.)	Α
5 (R)	4 (B)	VVEL control shaft position sensor 1 (bank 2)	Input	[Engine is running]Warm-up conditionIdle speed	0.25 - 1.40 V	EC
				[Engine is running]Warm-up conditionWhen revving engine up to 3,000 rpm quickly	0.25 - 4.75 V	С
6 (B)	_	Sensor ground [VVEL control shaft position sensor 1 (bank 1)]	_	_	_	D
7 (W)	6 (B)	Sensor power supply [VVEL control shaft position sensor 1 (bank 1)]	_	[Ignition switch: ON]	5 V	Е
8 (R)	14 (B)	Power supply for VVEL control module	_	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)	F
9 (W)	4 (B)	Sensor power supply [VVEL position sensor 1 (bank 2)]	_	[Ignition switch: ON]	5 V	G
11 (G)	_	CAN communication line [ECM]	Input/ Output	_	_	
12 (G)	14 (B)	VVEL actuator motor (High lift) (bank 1)	Output	[Engine is running] • Warm-up condition • Idle speed	0 - 14 V★ 100μSec/div 5V/div JMBIA0854ZZ	H
				[Engine is running]Warm-up conditionWhen revving engine up to 3,000 rpm quickly	0 - 14 V★ 100μSec/div 5V/div JMBIA085522	K
13 (W)	14 (B)	VVEL actuator motor power supply (bank 1)	Input	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)	M
14 (B)	_	VVEL control module ground		_	_	N

0

< ECU DIAGNOSIS INFORMATION >

Termi	nal No.	Description			Value
+	_	Signal name	Input/ Output	Condition	(Approx.)
15	14 (B)	VVEL actuator motor (Low lift) (bank 2)	Output	[Engine is running]Warm-up conditionIdle speed	0 - 14 V★ 100μSec/div 5V/div JMBIA0854ZZ
(G)				[Engine is running]Warm-up conditionWhen revving engine up to 3,000 rpm quickly	0 - 14 V★ 100μSec/div 5V/div JMBIA08552Z
40	19 (L)	VVEL control shaft position sensor 2 (bank 1)	Input	[Engine is running]Warm-up conditionIdle speed	3.50 - 4.75 V
16 (G)				[Engine is running]Warm-up conditionWhen revving engine up to 3,000 rpm quickly	0.25 - 4.75 V
17 (L)	_	Sensor ground [VVEL control shaft position sensor 2 (bank 2)]	_	_	_
18	17 (L)	VVEL control shaft position sensor 2 (bank 2)	Input	[Engine is running] • Warm-up condition • Idle speed	3.50 - 4.75 V
(G)				[Engine is running]Warm-up conditionWhen revving engine up to 3,000 rpm quickly	0.25 - 4.75 V
19 (L)	_	Sensor ground [VVEL control shaft position sensor 2 (bank 1)]	_	_	_
20 (Y)	19 (L)	Sensor power supply [VVEL control shaft position sensor 2 (bank 1)]	_	[Ignition switch: ON]	5 V
21 (V)	14 (B)	VVEL actuator motor relay abort signal [ECM]	Input	[Engine is running]Warm-up conditionIdle speed	0 V
22 (Y)	17 (L)	Sensor power supply [VVEL control shaft position sensor 2 (bank 2)]	_	[Ignition switch: ON]	5 V
23 (L)	14 (B)	VVEL control motor relay	Output	[Ignition switch: OFF]	BATTERY VOLTAGE (11 - 14 V)
		CAN communication line	lme::#/	[Ignition switch: ON]	0 - 1.0 V
24 (R)	-	CAN communication line [ECM]	Input/ Output	_	_

VVEL CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[VK50VE]

Termi	inal No.	Description			Value
+	_	Signal name	Input/ Output	Condition	(Approx.)
25	14	VVEL control motor	Output	[Engine is running]Warm-up conditionIdle speed	0 - 14 V★ 100μSec/div 5V/div JMBIA0854ZZ
(BR)	(B)	(Low lift) (bank 1)	Сара	[Engine is running]Warm-up conditionWhen revving engine up to 3,000 rpm quickly	0 - 14 V★ 100μSec/div 5V/div JMBIA0855ZZ

 $[\]bigstar$: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

F

D

Е

Α

G

Н

^

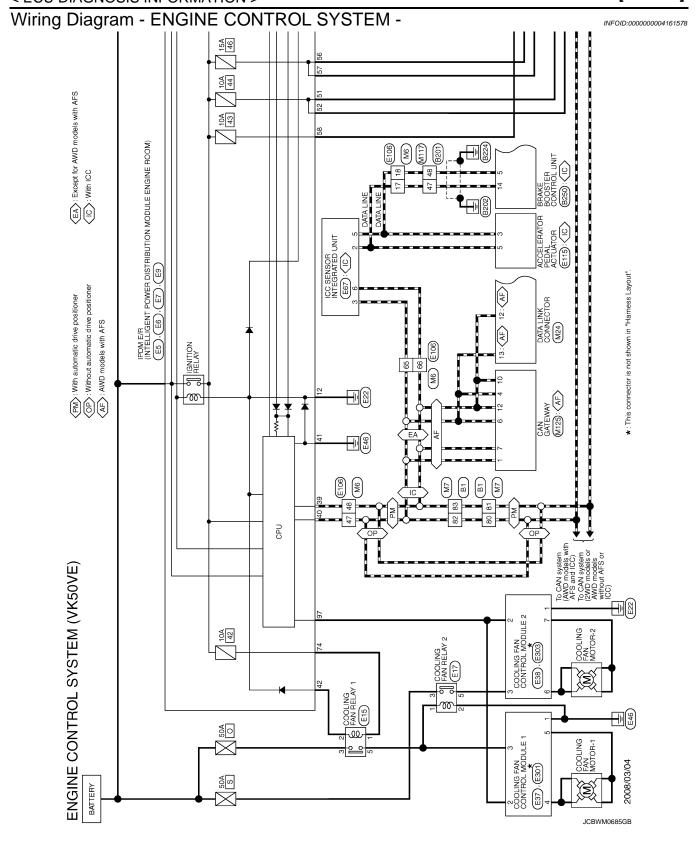
L

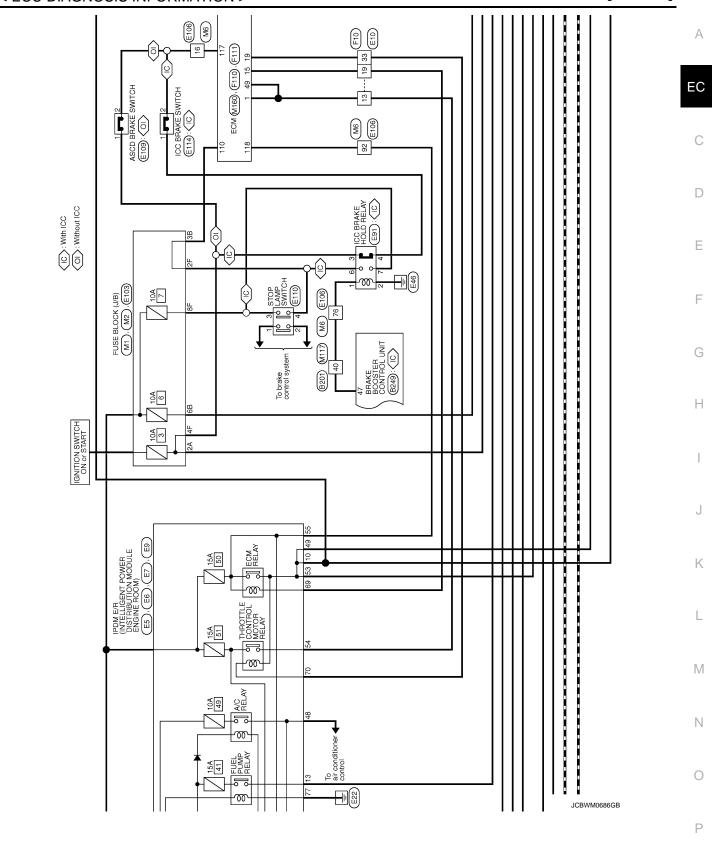
VI

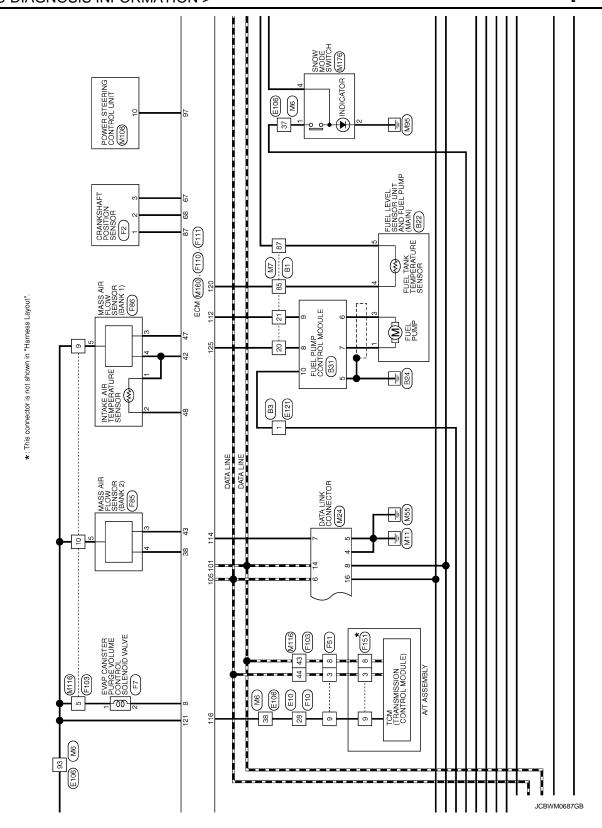
Ν

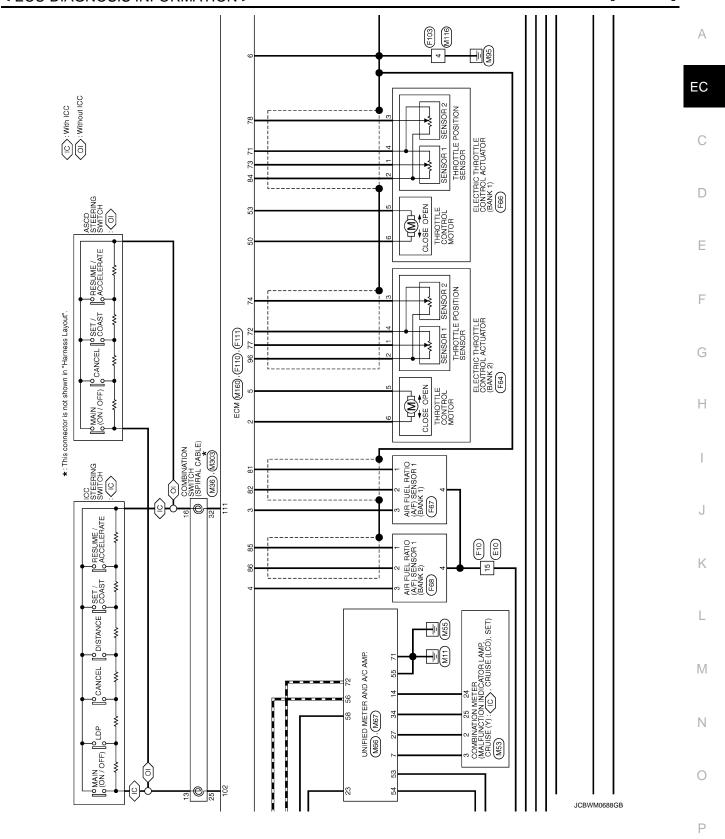
0

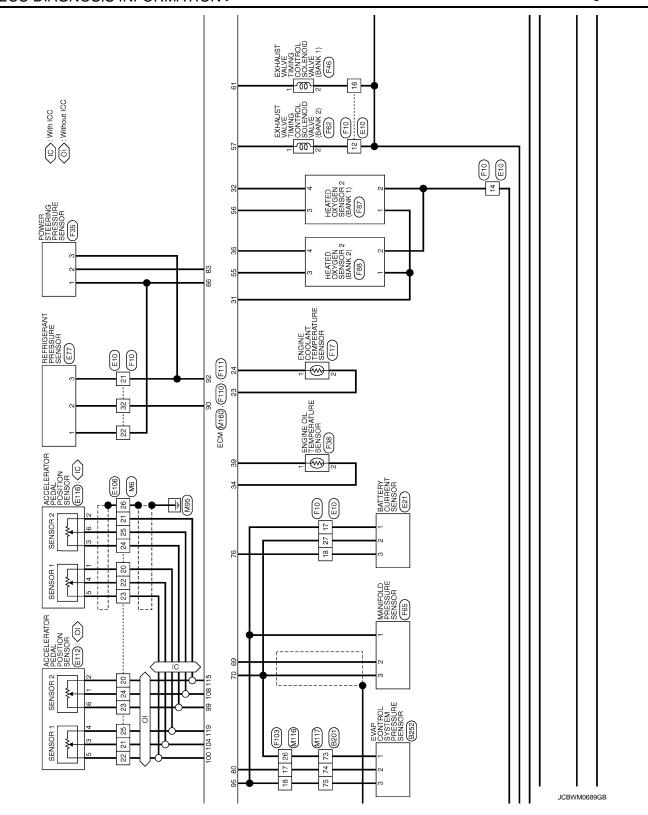
Р

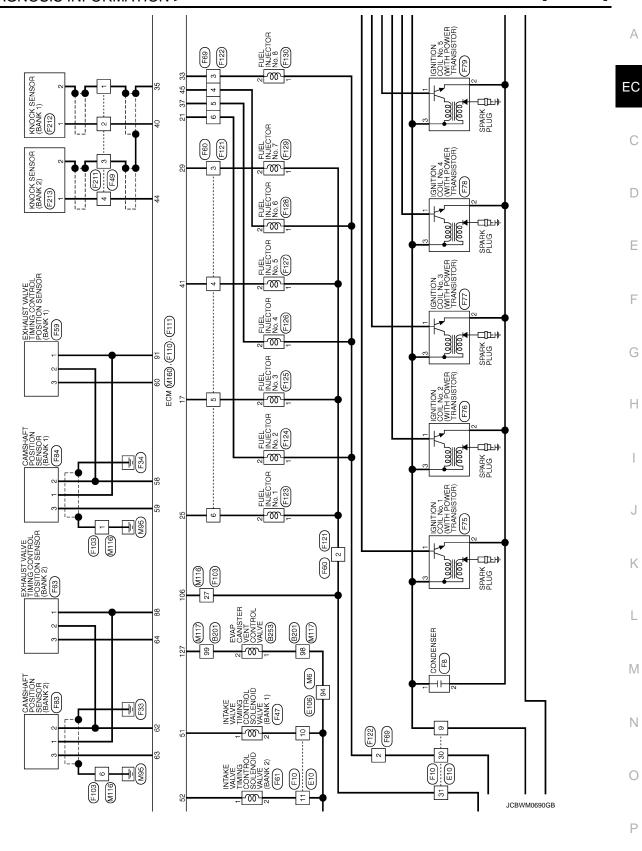


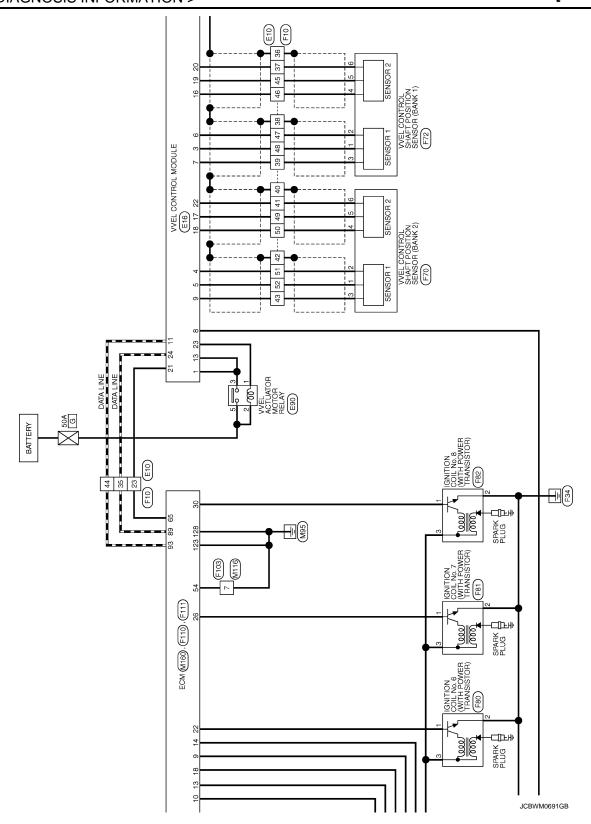












Α

EC

С

D

Е

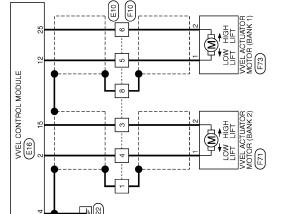
F

G

Н

J

Κ



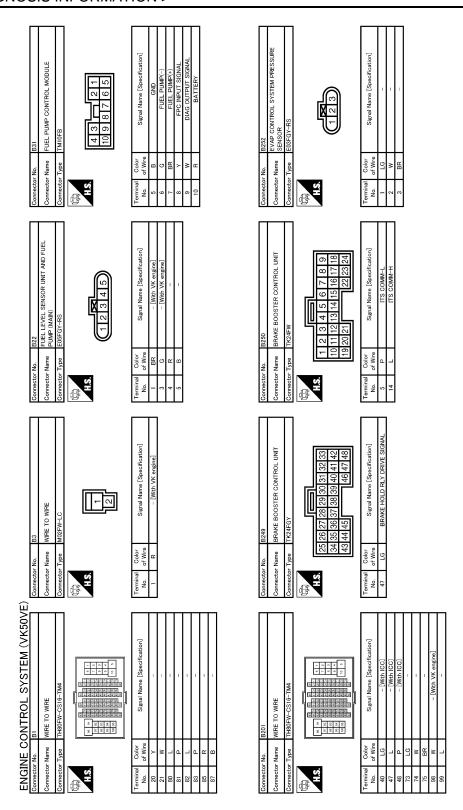
M

Ν

0

Р

JCBWM0692GB



JCBWM0693GB

EC

Α

С

D

Е

F

G

Н

1

J

K

L

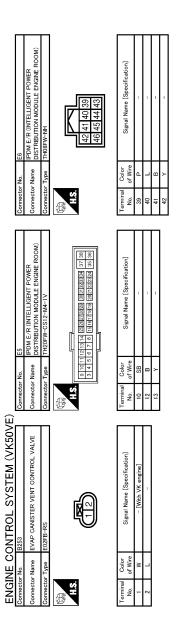
M

Ν

0

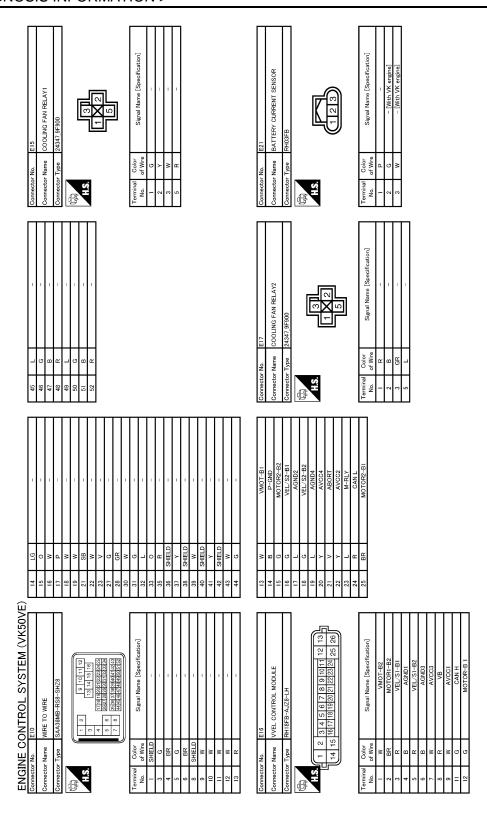
Ρ

JCBWM0694GB



. E9	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)	pe TH16FW-NH		98 97 96 95 94 93 92 91 106 105 104 103 102 101 100 99	Color Signal Name [Specification]	_ ^										
Connector No.	Connector Name	Connector Type	優	i	Ferminal C No. of	97										
- 0 02	74 G – [With VK engine]			_												
E7	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)	TH20FW-CS12-M4		বর বন ভর চর চর হয় জরতার নাহর হয় বিশেষ কর্মান হয়। ধর্ম বন ধর বর তর চর হয় ছয় জরার হয় ছানার জনার জনার হয়।	Signal Name [Specification]	1	- [With VK engine]	-	-	-	-	1	- [With VK engine]	- [With VK engine]	-	-
or No.	Connector Name	Connector Type		_	al Color of Wire	_	Μ	9	М	Μ	۵	æ	0	ΓC	Υ	W
Connector No.	Connect	Connect	偃		Terminal No.	48	49	51	25	53	54	22	26	22	28	69

Revision: 2009 March EC-1199 2009 FX35/FX50



JCBWM0695GB

F67 Commetter Num CO SENSOR INTEGRATED UNIT Commetter Name Commetter Name Commetter Name Commetter Type Comme
INTEGRATED UNIT INTEGR
10 Signal Signal
Story Name ector Name ector Name ector Name or Winel Color Name ector Name ec
H Comman
Signal Name [Specification] Signal Name [Specification] Signal Name [Specification]
Connector No. E38
ENGINE CONTROL SYSTEM (VK50VE) Commetter Name COLUNG FAN CONTROL MODULE I Commetter Type Sizoi FGY-SNZ2 Commetter Name Sizoi FGY-SNZ2 Commetter Name Signal Name [Specification] At S. Commetter Name VVEL ACTUATOR MOTOR RELAY Commetter Type 24347 9F900 Commetter Type 24347 9F900 Commetter Type 24347 9F900 Commetter Type 24347 9F900 Commetter Name [Specification] At S. Commetter Name Signal Name [Specification] At S. Commetter Name Signal Name [Specification] At S. Commetter Name Signal Name [Specification] At S. Commetter Name Signal Name [Specification] At S. Commetter Name Signal Name [Specification] At S. Commetter Name Signal Name [Specification] At S. Commetter Name Signal Name
CONTROL Signal N in Signal N i
Connector Name Connec
JCBWM0696GB

Revision: 2009 March EC-1201 2009 FX35/FX50

Connector No. E110	Connector Name	Connector Type MMAFW-LC	Terminal Oolor Signal Name [Specification] No. Orlor Signal Name [Specification]	DAL ACTUATOR Connector Name SENSOR (WITH LCC) Connector Type AAZüöffBi AAZüöffBi AAZüöffBi AAZüöffBi AAZüöffBi	Signal Name [Specification] Terminal No. of Wire ITS COMM-L. Of Wire ITS COMM-H. Signal Name [Specification] ITS COMM-H 2 BR -
Connector No. E109		Connector Type MAZFBR-LC	Terminal Color Signal Nan No. of Wire Signal Nan 1 0 2 SB	Connector No. E115 Connector Name ACCELERATOR PEDAL ACTUATOR Connector Type KDZ08FB TH.S. 64 2	Terminal Color Signal Nam No. of Wire Signal Nam Signa
	GR - L -	6 G		0. E114 Inc BRAKE SWITCH (WITH ICC) INC BRAKE SWITCH (WITH	Color Signal Name [Specification] of Wire G S S S S S S S S S S S S S S S S S S
(E)	38	48 65 66 66 92 93 94		Connector No. Connector Name Connector Type H.S.	Terminal (No. 0)
ENGINE CONTROL SYSTEM (VK50VE) Connector No.		Connector Type	No. of Wire Signal Name [Specification] No. of Wire Signal Name [Specification] 16	Connector No. Connector Name SENSOR (WITHOUT ICC) Connector Type RH06FB A.C. Connector Type RH06FB A.S. Connector Type RH06FB Connector Type RH06FB	Terminal Color Signal Name [Specification] 1 P -

JCBWM0697GB

ac l	<u> </u>				Α
F2 RH03FB T123	Signal Name [Specification] - [With VK engine] - [With VK engine]				EC
_ e _ e	O O O O O O O O O O O O O O O O O O O				С
Connector No. Connector Name Connector Type H.S.	Terminal CG No. 1				D
IODULE 2	ffcation]				Е
E303 COOLING FAN CONTROL MODULE 2 (COOLING FAN MOTOR-2) 6188-0259	Signal Name [Specification]				F
9 9	Color of Wire				G
Connector Name Connector Type H.S.	Terminal No.				Н
ROL MODULE 1	Signal Name [Specification]		Signal Name [Specification]		I
E301 COOLING FAN CONTROL MODULE 1 (COOLING FAN MOTOR-1) 6188-0259	Signal Name	FB CONDENSER MOZFW-LC	Signal Name		J
Connector No. Connector Name Connector Type H.S.	Terminal Color No. of Wire 5 5 5 5 5	Connector No. F8 Connector Name 00 Connector Type M0 H.S.	Terminal Color No. of Wire 1 W T		K
K20VE)					L
ENGINE CONTROL SYSTEM (VK50V Connector No. E121 Connector Name WIRE TO WIRE Connector Type MOZWW-LC H.S.	Signal Name [Specification]	EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE EGZFL-RS-LGY	Signal Name [Specification]		M
CONTROL E121 WINE TO WINE MOZAWA-LC MOZAWA-LC	Ш				Ν
ENGINE (Connector No. Connector Name Connector Type H.S.	Terminal Color No. 1 Y	Connector No. Connector Name Connector Type	Color Colo		0
				JCBWM0698GB	Р
					1

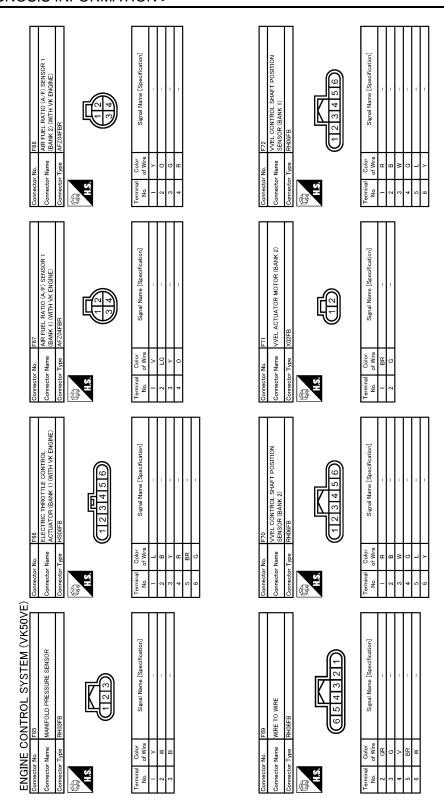
Revision: 2009 March **EC-1203** 2009 FX35/FX50

45	- 1	Connector Type		- 5	10 B B C C C C C C C C C C C C C C C C C	ĸ			ŀ	ē	No. of Wire	2 BR - With VK engine										Connector No. F45 Connector No. F47	Connector Name EXHAUST VALVE TIMING CONTROL Connector Name Control Connector Name Control Control Name Contro	Connector Type	đ		(12))		ermina	of Wire Signal Name [Specification] No.	of Wire Signal Name [Specification] No. of Wire
- 41	Н	17 GR	H	0:	21 V =	a 91	Н	28 LG –	Н	BR	32 G	35 P	36 SHIELD –	37 Y	38 SHIELD -	39 W	40 SHIELD –	41 Y	42 SHIELD –	43 W -	44 LG -	Connector No. F38	Connector Name	Connector Type E02FGY-RS	1	李子	(15))	L	20100	<u>a</u>	Color of Wire
ENGINE CONTROL SYSTEM (VK50VE) Connector No. F10	ne	Connector Type SAA36FB-RS8-SHZ8		CMM 12 11 10 9 1 1 1 1		25/24/23/22/21/20/19/19/17	73635	52[51] 50[48] 48[47] 46[45] 44	Ŀ	la.	No. of Wire	- C	BR		- M 9	8 SHIELD -	- М 6	. 5 01	L	>	13 P –	Connector No. F35	Connector Name POWER STEERING PRESSURE SENSOR	Connector Type RK03FB	1	Arthur Ar	(123)		L	3000	ø	Color of Wire

JCBWM0699GB

Connector No. F60 Connector Name Wife TO WIRE Connector Type RH06FB H.S.	Terminal Color Nigral Name (Specification) Color Nigral Name (Specification) Color Nigral Name Color Nigral Name Color Nigral Name Color Nigral Name Nigral	Connector No. F64 Connector Name ELECTRIC THROTTLE CONTROL Connector Type HS06FB HS06FB TABLE TA	Terminal Color No. of Wire Signal Name [Specification]		A C D
Connector No. F39 Connector Name Parkust VALVE TIMING CONTROL Connector Type RH09FB HS.	Terminal Color Signal Name [Specification]	Connector No. F63 Connector Name EXPANS I VALVE TIMING CONTROL Connector Type RH03FB H03FB H13.	Terminal Color Signal Name [Specification]		E F G
Connector No. F51	Terminal Color Signal Name Specification Color Signal Name Specification Color Signal Name Specification Color	Connector No. F62 Connector Name SCHAUST VALVE TIMING CONTROL Connector Type EUZFG-RS-LGY LAS	Terminal Color Signal Name Specification		I J
ENGINE CONTROL SYSTEM (VK50VE) Connector Name WIRE TO WIRE Connector Type RS94MB	Terminal Color Nu. of Wire Signal Name [Specification]	Connector No. F61 Int.Act VALVE TIMENG CONTROL	Terminal Color Signal Name [Specification]	JCBWM0700GB	M N
					D

Revision: 2009 March **EC-1205** 2009 FX35/FX50



JCBWM0701GB

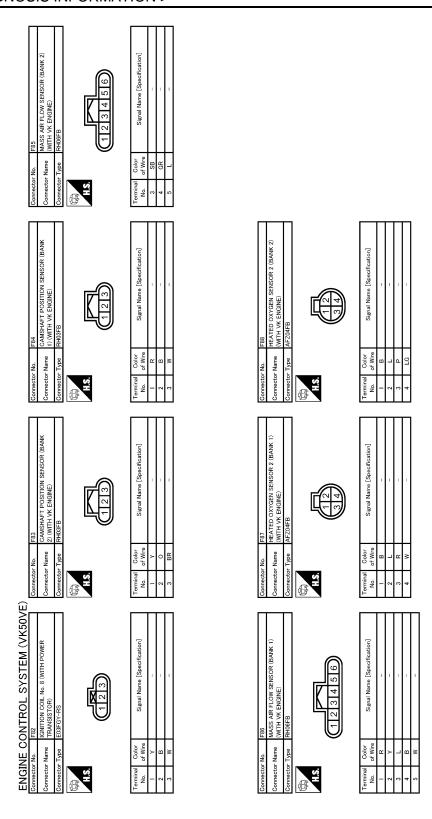
VVEL CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[VK50VE]

Connector No. F77 Connector Name FRANISSTOR) (WITH VK ENGINE) Connector Type EUGFGY-RS LAS	Color Color Signal Name [Specification]	Connector No. F81 Connector Name IGNITION COLL No. 7 (WITH POWER Connector Type ERGFGY-RS LAS	Color Color Signal Nane [Specification] Color	EC	
F76 EUGHTON COLL No. 2 (WITH POWER TRANSSTOR) (WITH WE BUGINE) EUGFGY-RS 1 2 3	Signal Name [Specification]	EGOFGY-RS EGOFGY-RS TAMBSTOR (WITH VK ENGINE)	Signal Name [Specification]	E	
Connector No. F76 Connector Name TTRANS Connector Type EUSFC	Terminal Color No. of Wire 2 B B B 3 W	Connector No. F80 Connector Name IRANSISTO Connector Type E03F07-F8 H.S.	Terminal Color No. of Wire 1 LG 2 B 3 W	G	
F75 IGNITION COLL NO. 1 (WITH POWER TRANSISTOR) (WITH VK ENGINE) EUGFGV-HS 1 2 3	Signal Name (Specification)	F19 IGNITION COIL No. 5 (WITH POWER FEASUSSION) (WITH VK. ENGINE) EGGFGY-RS	Signal Name [Specification]	I	
Connector No. F75 Connector Name IGNANISTOR OF Connector Type EUGFGY-RS MA.S. H.S.	Terminal Golor Sir No. of Wire Sir	Connector No. F79 Connector Name IRANSISTO Connector Type EOSFCY-RS H.S.	Terminal Color No. of Wire SB 2 B 3 W	J K	
SYSTEM (VK50VE) OR MOTOR (BANK 1)	Signal Name [Specification]	VW ENGINE)	Signal Name [Specification]	L	
CONTROL F73 VVEL ACTUAT X02FB	Color of Wire B	No. F78 Name IGNITION COLL No. 4 (WITH POWER TRANSISTOR). (WITH VK ENGINE) Type E03FGY-RS	Objer GR W W W W	N	1
ENGINE Connector No. Connector Name Connector Type	Terminal No. 1	Connector No. Connector Name Connector Type H.S.	Terminal No. 1 2 3 3	JCBWM0702GB	

Revision: 2009 March EC-1207 2009 FX35/FX50



JCBWM0703GB

EC

Α

D

Е

F

G

Н

1

Κ

L

M

Ν

0

JCBWM0704GB

Ρ

																					M ?	> -	J >-																			
T																																					GND		W KNK1			SB QA-B2
44																					+	+	╁	Н	\dashv	+	╀	H	Н	4	+	╀	┝	35 B	H	Н	Н	Н	40	Н	\dashv	43
-		П			5 4 3 2			L													Т		Т			48 44 40 36 32 28 24 20 16 12 8 4	47 43 39 35 31 27 23 19 15 11 7 3	46 42 38 34 30 26 22 18 14 10 6 Z		ļ	olor Signal Name [Specification]		L MOTORI-B2	γ AFH-B1				W EVAP	G IGN #2	Y IGN #1		GR IGN #4
Connector No.	onnector Nai	onnector Typ	F	SH	38 37 3			<u>a</u>	┪	┪	+	T	t	+	╀	╀	H	┝	Н		onnector No.	onnector Nar	onnector Typ	á	ا آ	⊢ Si			1	- 1-		t	2	3	4	2 E	9	8	6	10	\dashv	14 G
		ne WIRE TO WIRE	WRE TO WIRE 44 TR36FW-NS:10	WIRE TO WIRE	WIRE TO WIRE TK36FW-NS:10	WIRE TRABETO WIRE	WIRE TO WIRE TRIBETW-NS 10 AND TRIBETW-NS 10 AND TRIBETS AND TR	WIRE TO WIRE TKISEW-NS10 TRIBER-WAS10 STREET THE STR	WIRE TO WIRE TRISEW-NSIO FROM THE TO WIRE State of the state of the	WIRE TO WIRE TRAGEW-NS10 State of the stat	WIRE TRABETOWINE TRABETOWINE TRABETOWINE Signal Name [Specification]	WIRE TO WIRE TRISEW-NS10 FINANCIAL STATE OF ST	WIRE TO WIRE TRASEW-NS:10 PRESERVED TO WIRE Signal Name [Specification] B - [With VK engine] - [With VK engine]	WINE TO WINE TRABETO WINE TRABETO WINE TRABETO	WIRE TO WIRE	TK36FW-NS10	WIPE Complete Co	WIRE	WIRE TO WIRE	WIRE TO WIRE	WIRE TO WIRE TKSBFW-NS10 S 1 2 1 1 1 1 1 1 1 1	WIPE TO WIPE	WIRE TO WIRE WIRE	WIRE TO WIRE Trigger-Wision September Trigger-Wision September Trigger-Wision September Trigger-Wision September Trigger-Wision September Trigger-Wision September Trigger-Wision Tr	WINDER TO WIRE	WINE TO WIRE WAS PROBLEM	Triggery-NS:10	WIRE TO WIRE TYGGEN-HS10 C C C C C C C C C	WINE TO WINE WINE TO WINE WINE	Figure Name Specification	Triggery-HSIO Triggery-HSI	Tricise Principle Tric	Triggery-HSIO	Trispervin Nation Tris	Triggery-HSIO	Trustery-HSI 0	Tricate-Westing Tricate-We	Trisdetwind Trisdetwind	Triggety-NSIO	The control of the	Mile TO WREE To WREE TO WREE	The first of the

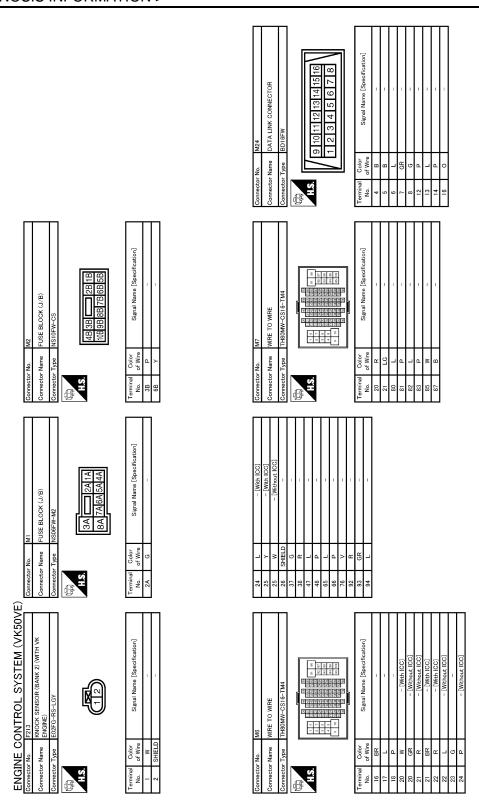
Connector No. F121	Connector Name WIRE TO WIRE	П	Connector Type RH06MB	1		(e)] - 	(1213141515)			la	No. of Wire	2 W –	3 0 -	4 W	5 R -								Connector No. F125	FILE INJECTOR No. 3 (WITH VK		Connector Type HS02FGY	图	HS		Terminal Color Signal Name [Specification]	+	2 R -		
AVCC2-POS	AVCC-PHS-B2	ENGCAN-L	PDPRES	AVCC2-PHS-B1	FNGCAN-H	AVCC2-PRES	AVCC-TPS-B2																	F124	FLIEL INJECTOR No. 9 (WITH VK		HS02FGY		[Signal Name [Specification]	ı	-		
87 R	Н	+	+	16 00	╀	╀	7 96																	Connector No.		Connector Name	Connector Type	匮	H.S.		Terminal Color	+	2 B		
() 60 G EX PHASE-BI	61 G	0	BB 4	64 P EXPHASE-B2	GR	j >-	68 B GNDA-POS	69 W INTPRES	70 B GNDA-EVAPPRS/INTPRS/CUR	71 R GNDA-TPS-B1	72 Y GNDA-TPS-B2	73 L TPS1-B1	74 R TPS2-B2	76 G CURSEN	77 B TPS1-B2	78 Y TPS2-B1	80 GR EVAPPRS	81 V AF(+)-B1	82 LG AF(-)-B1	83 SB PSPRES	84 B AVCC-TPS-B1	85 Y AF(+)-B2	86 O AF(-)-B2	Connector No. F123	Т		Connector Type HS02FGY	E	H.S.		Terminal Color Signal Name [Specification]	+	2 R –		
ENGINE CONTROL SYSTEM (VK50VE) Connector No. F111	Connector Name FCM (WITH VK ENGINE)		Connector Type RH40FBR-RZ8-L-LH-Z			96 92 88 84 80 76 72 68 64 60 56 52	1 C CC 60 02 1/3 1/3 1/3 1/3 1/3 1/3 1/3 1/3 1/3 1/3	93 89 85 81 77 73 69 65 61 57 53 49			-ea	of Wire	49 V VMOT-B1	9	0	٦ .	BR MO	54 B GND	Ь	В	57 Y EX CVTC-B2	58 B GNDA-PHS-B1	59 W IN PHASE-B1	Gonnector No. F122	Γ		Connector Type RH06MB	優	HS.	(123456)	Terminal Color Signal Name [Specification]	+	3 6	Н	2.0

JCBWM0705GB

VVEL CONTROL MODULE

Connector No. F129 Connector Name FUEL INJECTOR No. 7 Connector Type HSGPFGY HS.	Terminal Color Signal Name Specification	Comector No. F212	EC C
Connector No. F128 Connector Name FUEL INJECTOR No. 6 (WITH VK PUEL INJECTOR No. 6 (WITH VK CONNECTOR TO THE PROPERTY PR	Terminal Color Signal Name (Specification)	ector N inal	F G
Connector No. F127 Connector Name FUEL INJECTOR No. 5 (WITH VK ENGINE) Connector Type HSQZFGY TAS TAS TAS TAS TAS TAS TAS TA	Terminal Color Signal Name [Specification]	Connector No. F151 Connector Name TOM (TRANSMISSION CONTROL MODULE) Connector Type SP10FG	J K
ENGINE CONTROL SYSTEM (VK50VE) Connector Name FUEL INJECTOR No. 4 (WITH VK Connector Name FUEL INJECTOR No. 4 (WITH VK Connector Type HSQZFGY MARK THE	Color Signal Name (Specification) No. of Wire Signal Name (Specification) 2 R	Connector No. F130 Connector Type HS02FGY Connector Type HS02FGY H.S. Terminal Color No. of Wire 1 W - 2 G G -	L M N
R Sonn	[<u>¤</u> _ []	Conn Tampo N Tampo N Danno N Tampo N Tampo N Tampo N Tampo N Danno N D	JCBWM0706GB

Revision: 2009 March EC-1211 2009 FX35/FX50



JCBWM0707GB

VVEL CONTROL MODULE

Connector No. MR7 Connector Type ITH32FW-NH M.S. ITH32FW-NH ITH32FW-R4 AG 66 47 48 49 50 12 25 54 55 55 55 55 55 55 55 55 55 55 55 55	Terminal Color Signal Name [Specification] No. of Wire Signal Name [Specification] 53	Connector No. M117	EC C
r No. M66 r Name UNIFED METER AND A/C AMP. r Type TH40FW-NH 1 Z 3 4 S 6 7 8 9 10 11 12 33 4 S 6 2 3 8 S 41 12 12 12 12 12 12 12 12 12 12 13 13 13 15 11 12 13 13 13 13 13 13 13 13 13 13 13 13 13	Signal Name (Specification) COMM (AMP->METER) COMM (LOP->METER) COMM (METER->MAP) COMM (AMP->LCD)		E
Corrector No. MSG Corrector Name UNIFIED METE Corrector Type TH40FW-NH (1 2 3 4 5 6 7 8 8 10 (1 2 2 5 4 4 5 6 7 7 8 2 10 (1 2 2 5 4 4 5 6 7 7 8 2 10 (1 2 2 5 4 4 5 6 6 7 7 8 2 10 (1 2 2 5 4 4 5 6 6 7 7 8 2 10 (1 2 2 5 4 4 5 6 6 7 7 8 2 10 (1 2 2 5 4 4 5 6 6 7 7 8 2 10 (1 2 2 5 4 4 5 6 6 7 7 8 2 10 (1 2 2 5 4 4 5 6 6 7 7 8 2 10 (1 2 2 5 4 4 5 6 6 7 7 8 2 10 (1 2 2 5 4 4 5 6 6 7 7 8 2 10 (1 2 2 5 4 4 5 6 7 7 8 2 10 (1 2 2 5 4 4 5 6 7 7 8 2 10 (1 2 2 5 4 4 5 6 7 7 8 2 10 (1 2 2 5 4 4 5 6 7 7 8 2 10 (1 2 2 5 4 4 5 6 7 7 8 2 10 (1 2 2 5 4 4 5 6 7 7 8 2 10 (1 2 2 5 4 4 5 6 7 7 8 2 10 (1 2 2 5 4 4 5 6 7 7 8 2 10 (1 2 2 5 4 4 5 6 7 7 8 2 10 (1 2 2 5 4 4 5 6 7 7 8 2 10 (1 2 2 5 4 4 5 6 7 7 8 2 10 (1 2 2 5 4 4 5 6 7 7 8 2 10 (1 2 2 5 4 7 8 1 7 8 1 8 1 7 8 1 8 1 7 8 1 8 1 8 1	Color Color Signal Color Signal Color Co	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	G
ER (1977)	Signal Name [Specification] COMM (METER-SAMP) COMM (AMP-SAMETER) COMM (AMP-SAMP) COMM (AMP-SAMP)		H
Connector No. M53 Connector Name COMBINATION METER Connector Type TH40FW-NH 1.8 1.2 1.2 1.2 1.3 1.3 1.3 1.3 1.3	Color of Wire	The control of the	J
Ξ	Terminal No. 2 2 3 2 4 24 24 24 25 25	Commetto Com	
ENGINE CONTROL SYSTEM (VK50V Domector No. M36 Somector Name COMBINATION SWITCH (SPIRAL CABLE) Somector Type TKUBFGY-1V TKUBFGY-1V TKUBFGY-1V TKUBFGY-1V TKUBFGY-1V TKUBFGY-1V TKUBFGY-1V TKUBFGY-1V	Signal Name [Specification]	MIGB POWER STEERING CONTROL UNIT THIZFW-NH 1 2 3 4 5 6 7 8 9 10 11112 Signal Name [Specification] ENG TACHO	М
CONTROL M36 TROBEGY-IV TROBEGY-IV 3133	Color of Wire	MIGG POWERS 7 12 12 12 13 14 15 16 16 16 16 16 16 16 16 16 16 16 16 16	N
ENGINE C Connector No Connector Name Connector Type H.S.	Terminal Co No. 0f V 25 S S S S S S S S S S S S S S S S S S	Connector No. Connector Name Connector Type H.S. H.S. 10 of Wife 10 of Wife	0
			JCBWM0708GB

Revision: 2009 March **EC-1213** 2009 FX35/FX50

CONTROL SYSTEM (VK50)	(F)						ı
Connector No. M125	Connector No.	M160	108	Ь	APS2 [Without ICC]	Connector No. M176	1
Connector Name CAN GATEWAY	Connector Name	ECM (WITH VK ENGINE)	01 ;	<u>د</u> ه	BRAKE	Connector Name SNOW MODE SWITCH	
			Ξ	>	GNDA-ASCDSW		
Connector Type TH12FW-NH	Connector Type	RH24FGY-RZ8-R-LH-Z	112	PC	FPCMCK	Connector Type TK08FW	
Ŕ	ą		114	GR	K-LINE	Ą	
肾	昼		115	BR	GNDA-APS2 [With ICC]	10000000000000000000000000000000000000	
Y	Ž.	T 128 123 133 130 148 149 108 108 100 100	115	GR	GNDA-APS2 [Without ICC]		
		120 121 120 110 110 101 101 101 101 101	116	5	NEUT-H	5 7 4	
1 2 3 4 5 6		405 400 440 444 440 400 00	117	BB	BNCSW	7	
7 8 9 10 11 12		117 113	118	œ	BATT		
			119	*	GNDA-APS1		
			120	*	TF.		
Terminal Color	Terminal Color		121	æ	VBR	Terminal Color	Г
	_	Signal Name [Specification]	123	В	GND		
1 CAN-H	97 R	TACHO	125	œ	FPCM	1 BR	Г
4 L CAN-H	H	AVCC2-APS2 [With ICC]	127	PC	CDCV	2 B =	Γ
6 L CAN-H	9 66	AVCC2-APS2 [Without ICC]	128	В	GND	- ×	Г
7 P CAN-L	100 G	AVCC-APS1 [With ICC]					1
10 P CAN-L	100 L	AVCC-APS1[Without ICC]					
12 P CAN-L	101 P	VEHCAN-L					
	102 SB	ASCDSW					
	┞						
	105 L	VEHCAN-H					
	106	WSNSI					
	200	[OOI HONG COUNTY					
	3	Coordinated to the					
Connector No. M303							
Connector Name COMBINATION SWITCH (SPIRAL CABLE)							
Connector Type TK08FGV							
7							
List.							
00 40 40 47 40 45 44 40							
61 41 61 01 /1 81 61 07							
Terminal Color							
13 B							

JCBWM0709GB

[VK50VE] < SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS

ENGINE CONTROL SYSTEM SYMPTOMS

Symptom Table INFOID:0000000003959057

SYSTEM — BASIC ENGINE CONTROL SYSTEM

							S	/MPT	OM						
		HARD/NO START/RESTART (EXCP. HA)	ENGINE STALL	HESITATION/SURGING/FLAT SPOT	SPARK KNOCK/DETONATION	LACK OF POWER/POOR ACCELERATION	HIGH IDLE/LOW IDLE	ROUGH IDLE/HUNTING	IDLING VIBRATION	SLOW/NO RETURN TO IDLE	OVERHEATS/WATER TEMPERATURE HIGH	EXCESSIVE FUEL CONSUMPTION	EXCESSIVE OIL CONSUMPTION	BATTERY DEAD (UNDER CHARGE)	Reference page
Warrant	y symptom code	AA	AB	AC	AD	AE	AF	AG	АН	AJ	AK	AL	AM	НА	•
Fuel	Fuel pump circuit	1	1	2	3	2		2	2			3		2	EC-993 EC-1099
	Fuel pressure regulator system	3	3	4	4	4	4	4	4	4		4			EC-1228
	Fuel injector circuit	1	1	2	3	2		2	2			2			EC-1096
	Evaporative emission system	3	3	4	4	4	4	4	4	4		4			EC-1229
Air	Positive crankcase ventilation system	3	3	4	4	4	4	4	4	4		4	1		EC-1120
	Incorrect idle speed adjustment	L					1	1	1	1		1			EC-577
	Electric throttle control actuator	1	1	2	3	3	2	2	2	2		2		2	EC-1000 EC-1007
Ignition	Incorrect ignition timing adjustment	3	3	1	1	1		1	1			1			EC-577
	Ignition circuit	1	1	2	2	2		2	2			2			EC-1107
Main po	wer supply and ground circuit	2	2	3	3	3		3	3		2	3			EC-739

Ν

0

Р

EC-1215 Revision: 2009 March 2009 FX35/FX50

EC

Α

С

D

Е

F

Н

Κ

L

M

< SYMPTOM DIAGNOSIS >

[VK50VE]

	SYMPTOM													
	HARD/NO START/RESTART (EXCP. HA)	ENGINE STALL	HESITATION/SURGING/FLAT SPOT	SPARK KNOCK/DETONATION	LACK OF POWER/POOR ACCELERATION	HIGH IDLE/LOW IDLE	ROUGH IDLE/HUNTING	IDLING VIBRATION	SLOW/NO RETURN TO IDLE	OVERHEATS/WATER TEMPERATURE HIGH	EXCESSIVE FUEL CONSUMPTION	EXCESSIVE OIL CONSUMPTION	BATTERY DEAD (UNDER CHARGE)	Reference page
Warranty symptom code	AA	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	НА	
Mass air flow sensor circuit	- ,			2	·									EC-768 EC-775
Engine coolant temperature sensor circuit	1					3			3					EC-784 EC-786 EC-792
Air fuel ratio (A/F) sensor 1 circuit		1	2	3	2		2	2			2			EC-799 EC-803 EC-806 EC-809 EC-1081
Throttle position sensor circuit						2			2					EC-789 EC-854 EC-996 EC-998 EC-1009
Accelerator pedal position sensor circuit			3	2	1									EC-1067 EC-1071 EC-1076
Knock sensor circuit			2								3			EC-864
Engine oil temperature sensor			4		2						3			EC-848 EC-851
Crankshaft position sensor circuit	2	2												EC-867
Camshaft position sensor circuit	3	2												EC-871
Vehicle speed signal circuit		2	3		3						3			EC-942
Power steering pressure sensor circuit		2					3	3						EC-951
ECM	2	2	3	3	3	3	3	3	3	3	3			EC-956 EC-958
Intake valve timing control solenoid valve circuit		3	2		1	3	2	2	3		3			EC-748 EC-762
Exhaust valve timing control solenoid valve circuit		3	2		1	3	2	2	3		3			EC-752 EC-765
VVEL control module	3		4	4	3									EC-1056 EC-1058
VVEL actuator motor	3		4	4	3									EC-979
VVEL actuator motor relay	3		4	4	3									EC-983
VVEL actuator shaft position sensor	3		4	4	3									EC-975
PNP signal circuit			3		3		3	3			3			EC-962

< SYMPTOM DIAGNOSIS > [VK50VE]

Α

EC

D

Е

F

G

Н

Κ

Ν

0

		SYMPTOM												
	HARD/NO START/RESTART (EXCP. HA)	ENGINE STALL	HESITATION/SURGING/FLAT SPOT	SPARK KNOCK/DETONATION	LACK OF POWER/POOR ACCELERATION	HIGH IDLE/LOW IDLE	ROUGH IDLE/HUNTING	IDLING VIBRATION	SLOW/NO RETURN TO IDLE	OVERHEATS/WATER TEMPERATURE HIGH	EXCESSIVE FUEL CONSUMPTION	EXCESSIVE OIL CONSUMPTION	BATTERY DEAD (UNDER CHARGE)	Reference page
Warranty symptom code	AA	AB	AC	AD	AE	AF	AG	АН	AJ	AK	AL	AM	НА	
Refrigerant pressure sensor circuit		2				3			3		4			EC-1122
Electrical load signal circuit							3							EC-1094
Air conditioner circuit	2	2	3	3	3	3	3	3	3		3		2	HAC-4
ABS actuator and electric unit (control unit)			4											BRC-5

^{1 - 6:} The numbers refer to the order of inspection.(continued on next page)

SYSTEM — ENGINE MECHANICAL & OTHER

							S	/MPT	ОМ						
		HARD/NO START/RESTART (EXCP. HA)	ENGINE STALL	HESITATION/SURGING/FLAT SPOT	SPARK KNOCK/DETONATION	LACK OF POWER/POOR ACCELERATION	HIGH IDLE/LOW IDLE	ROUGH IDLE/HUNTING	IDLING VIBRATION	SLOW/NO RETURN TO IDLE	OVERHEATS/WATER TEMPERATURE HIGH	EXCESSIVE FUEL CONSUMPTION	EXCESSIVE OIL CONSUMPTION	BATTERY DEAD (UNDER CHARGE)	Reference page
Warranty	y symptom code	AA	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	НА	Ī
Fuel	Fuel tank	-													FL-12
	Fuel piping	5		5	5	5		5	5			5			FL-4
	Vapor lock		5												_
	Valve deposit														_
	Poor fuel (Heavy weight gasoline, Low octane)	5		5	5	5		5	5			5			_

[VK50VE]

							S	/MPT	ОМ						
		HARD/NO START/RESTART (EXCP. HA)	ENGINE STALL	HESITATION/SURGING/FLAT SPOT	SPARK KNOCK/DETONATION	LACK OF POWER/POOR ACCELERATION	HIGH IDLE/LOW IDLE	ROUGH IDLE/HUNTING	IDLING VIBRATION	SLOW/NO RETURN TO IDLE	OVERHEATS/WATER TEMPERATURE HIGH	EXCESSIVE FUEL CONSUMPTION	EXCESSIVE OIL CONSUMPTION	BATTERY DEAD (UNDER CHARGE)	Reference page
Warranty s	ymptom code	AA	AB	AC	AD	AE	AF	AG	АН	AJ	AK	AL	AM	НА	
Air	Air duct														EM-178
	Air cleaner Air leakage from air duct (Mass air flow sensor — electric throttle control actuator)		5	5		5		5	5			5			EM-178 EM-178
	Electric throttle control actuator	5			5		5			5				:	EM-180
	Air leakage from intake manifold/ Collector/Gasket														<u>EM-180</u>
Cranking	Battery	1	1	1		1		1	1					1	<u>PG-5</u>
	Generator circuit		,	·			•								CHG-3
	Starter circuit	3										1			STR-2
	Signal plate	6													EM-251
	PNP signal	4													<u>TM-273</u>
Engine	Cylinder head Cylinder head gasket	5	5	5	5	5		5	5		4	- 5	3		<u>EM-251</u>
	Cylinder block														
	Piston												4		
	Piston ring	_	_	_	_	_		_	_			_			EM 00-
	Connecting rod	6	6	6	6	6		6	6			6			<u>EM-265</u>
	Bearing	•													
	Crankshaft														
Valve	Timing chain														EM-225
mecha- nism	Camshaft														EM-236
	Intake valve timing control	5	5	5	5	5		5	5			5			EM-225
	Exhaust valve timing control		J	J	J	3		3	3			5			EM-225
	Intake valve												3		EM-251
	Exhaust valve												Ĭ		
Exhaust	Exhaust manifold/Tube/Muffler/ Gasket	5	5	5	5	5		5	5			5			EM-207 EX-9
	Three way catalyst														

< SYMPTOM DIAGNOSIS >

							S١	/MPT	OM						
		HARD/NO START/RESTART (EXCP. HA)	ENGINE STALL	HESITATION/SURGING/FLAT SPOT	SPARK KNOCK/DETONATION	LACK OF POWER/POOR ACCELERATION	HIGH IDLE/LOW IDLE	ROUGH IDLE/HUNTING	IDLING VIBRATION	SLOW/NO RETURN TO IDLE	OVERHEATS/WATER TEMPERATURE HIGH	EXCESSIVE FUEL CONSUMPTION	EXCESSIVE OIL CONSUMPTION	BATTERY DEAD (UNDER CHARGE)	Reference page
Warranty	symptom code	AA	AB	AC	AD	AE	AF	AG	АН	AJ	AK	AL	AM	НА	
Lubrica- tion	Oil pan/Oil strainer/Oil pump/Oil filter/Oil gallery/Oil cooler Oil level (Low)/Filthy oil	5	5	5	5	5		5	5			5			LU-25 LU-28 LU-30 LU-31
Cooling	Radiator/Hose/Radiator filler cap														CO-37 CO-37
	Thermostat									5					<u>CO-47</u>
	Water pump	_	_	_	_	_		_	_		4	_			<u>CO-45</u>
	Water gallery	- 5	5	5	5	5		5	5		4	5			CO-33
	Cooling fan														<u>CO-43</u>
	Coolant level (Low)/Contaminated coolant									5					CO-33
IVIS (INFI NATS)	NITI Vehicle Immobilizer System —	1	1												SEC-5

^{1 - 6:} The numbers refer to the order of inspection.

L

[VK50VE]

Α

EC

D

Е

F

Н

M

Ν

0

Р

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS > [VK50VE]

NORMAL OPERATING CONDITION

Description INFOID:0000000003959058

FUEL CUT CONTROL (AT NO LOAD AND HIGH ENGINE SPEED)

If the engine speed is above 1,800 rpm under no load (for example, the selector lever position is neutral and engine speed is over 1,800 rpm) fuel will be cut off after some time. The exact time when the fuel is cut off varies based on engine speed.

Fuel cut will be operated until the engine speed reaches 1,500 rpm, then fuel cut will be cancelled. **NOTE:**

This function is different from deceleration control listed under Multiport Fuel Injection (MFI) System, <u>EC-600.</u> "System Description".

[VK50VE] < PRECAUTION >

PRECAUTION

PRECAUTIONS

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the "SRS AIR BAG" and "SEAT BELT" of this

Service Manual.

WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the "SRS AIR BAG".
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

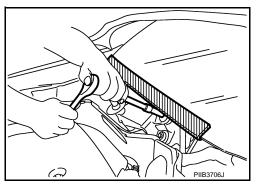
PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

WARNING:

- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.

Precaution for Procedure without Cowl Top Cover

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc.



Precautions For Xenon Headlamp Service

WARNING:

Comply with the following warnings to prevent any serious accident.

- Disconnect the battery cable (negative terminal) or the power supply fuse before installing, removing, or touching the xenon headlamp (bulb included). The xenon headlamp contains high-voltage generated parts.
- Never work with wet hands.
- Check the xenon headlamp ON-OFF status after assembling it to the vehicle. Never turn the xenon headlamp ON in other conditions. Connect the power supply to the vehicle-side connector. (Turning it ON outside the lamp case may cause fire or visual impairments.)
- Never touch the bulb glass immediately after turning it OFF. It is extremely hot.

EC

Α

Е

D

Н

K

INFOID:0000000004099944

INFOID:0000000004115432

N

2009 FX35/FX50

[VK50VE] < PRECAUTION >

CAUTION:

Comply with the following cautions to prevent any error and malfunction.

- Install the xenon bulb securely. (Insufficient bulb socket installation may melt the bulb, the connector, the housing, etc. by high-voltage leakage or corona discharge.)
- Never perform HID circuit inspection with a tester.
- Never touch the xenon bulb glass with hands. Never put oil and grease on it.
- Dispose of the used xenon bulb after packing it in thick vinyl without breaking it.
- Never wipe out dirt and contamination with organic solvent (thinner, gasoline, etc.).

On Board Diagnostic (OBD) System of Engine and A/T

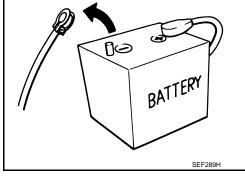
The ECM has an on board diagnostic system. It will illuminate the malfunction indicator lamp (MIL) to warn the driver of a malfunction causing emission deterioration.

CAUTION:

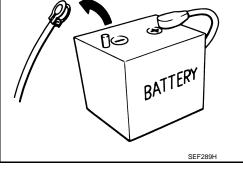
- Always turn the ignition switch OFF and disconnect the negative battery cable before any repair or inspection work. The open/short circuit of related switches, sensors, solenoid valves, etc. will cause the MIL to illuminate.
- Always connect and lock the connectors securely after work. A loose (unlocked) connector will cause the MIL to illuminate due to the open circuit. (Be sure the connector is free from water, grease, dirt, bent terminals, etc.)
- Certain systems and components, especially those related to OBD, may use a new style slide-locking type harness connector. For description and how to disconnect, refer to PG-110, "Description".
- Always route and secure the harnesses properly after work. The interference of the harness with a bracket, etc. may cause the MIL to illuminate due to the short circuit.
- Always connect rubber tubes properly after work. A misconnected or disconnected rubber tube may cause the MIL to illuminate due to the malfunction of the EVAP system or fuel injection system, etc.
- Always erase the unnecessary malfunction information (repairs completed) from the ECM and TCM (Transmission control module) before returning the vehicle to the customer.

General Precautions

- Always use a 12 volt battery as power source.
- Never attempt to disconnect battery cables while engine is runnina.
- Before connecting or disconnecting the ECM harness connector, turn ignition switch OFF and disconnect negative battery cable. Failure to do so may damage the ECM because battery voltage is applied to ECM even if ignition switch is turned OFF.
- Before removing parts, turn ignition switch OFF and then disconnect battery ground cable.

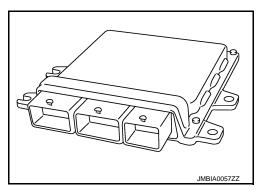


- Never disassemble ECM.
- If a battery cable is disconnected, the memory will return to the ECM value.
 - The ECM will now start to self-control at its initial value. Thus, engine operation can vary slightly in this case. However, this is not an indication of a malfunction. Never replace parts because of a slight variation.
- If the battery is disconnected, the following emission-related diagnostic information will be lost within 24 hours.
- Diagnostic trouble codes
- 1st trip diagnostic trouble codes
- Freeze frame data
- 1st trip freeze frame data
- System readiness test (SRT) codes
- Test values



INFOID:0000000003959062

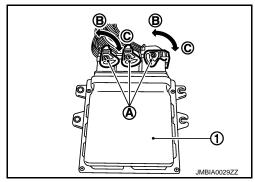
INFOID:0000000003959063



< PRECAUTION > [VK50VE]

• When connecting ECM harness connector (A), fasten (B) it securely with a lever as far as it will go as shown in the figure.

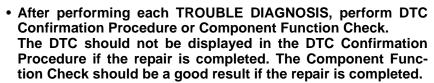
- ECM (1)
- Loosen (C)

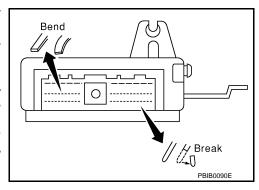


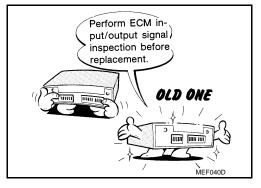
 When connecting or disconnecting pin connectors into or from ECM, never damage pin terminals (bends or break).
 Check that there are not any bends or breaks on ECM pin terminal, when connecting pin connectors.

Securely connect ECM harness connectors.
 A poor connection can cause an extremely high (surge) voltage to develop in coil and condenser, thus resulting in damage to ICs.

- Keep engine control system harness at least 10 cm (4 in) away from adjacent harness, to prevent engine control system malfunctions due to receiving external noise, degraded operation of ICs, etc.
- Keep engine control system parts and harness dry.
- Before replacing ECM, perform ECM Terminals and Reference Value inspection and check that ECM functions properly. Refer to <u>EC-1127</u>, "<u>Reference Value</u>".
- Handle mass air flow sensor carefully to avoid damage.
- Never clean mass air flow sensor with any type of detergent.
- Never disassemble electric throttle control actuator.
- Even a slight leakage in the air intake system can cause serious incidents.
- Never shock or jar the camshaft position sensor, crankshaft position sensor.









K

Α

EC

D

Е

Н

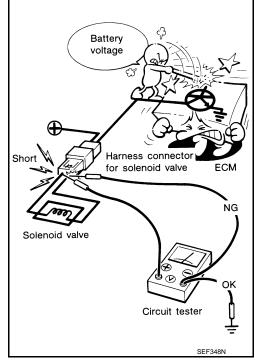
M

Ν

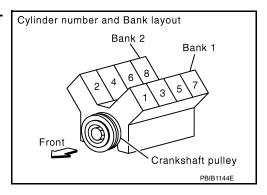
Р

< PRECAUTION > [VK50VE]

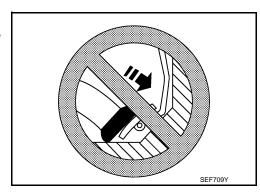
 When measuring ECM signals with a circuit tester, never allow the two tester probes to contact.
 Accidental contact of probes will cause a short circuit and damage the ECM power transistor.



- B1 indicates bank 1, B2 indicates bank 2 as shown in the figure.
- Never operate fuel pump when there is no fuel in lines.
- Tighten fuel hose clamps to the specified torque.



- · Never depress accelerator pedal when starting.
- · Immediately after starting, never rev up engine unnecessarily.
- Never rev up engine just prior to shutdown.

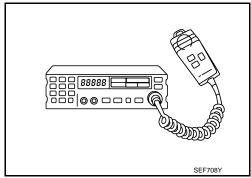


PRECAUTIONS

< PRECAUTION > [VK50VE]

 When installing C.B. ham radio or a mobile phone, be sure to observe the following as it may adversely affect electronic control systems depending on installation location.

- Keep the antenna as far as possible from the electronic control units.
- Keep the antenna feeder line more than 20 cm (8 in) away from the harness of electronic controls.
- Never let them run parallel for a long distance.
- Adjust the antenna and feeder line so that the standing-wave ratio can be kept smaller.
- Be sure to ground the radio to vehicle body.



Α

EC

С

D

Е

F

G

Н

1

,

K

L

n /I

Ν

0

Р

< PREPARATION > [VK50VE]

PREPARATION

PREPARATION

Special Service Tools

INFOID:0000000003959064

NOTE:

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name		Description
(J-44321) Fuel pressure gauge kit	LEC642	Checks fuel pressure

Commercial Service Tools

INFOID:0000000003959065

Tool name (Kent-Moore No.)		Description
Leak detector i.e.: (J-41416)	S-NT703	Locates the EVAP leak
EVAP service port adapter i.e.: (J-41413-OBD)	S-NT704	Applys positive pressure through EVAP service port
Fuel filler cap adapter i.e.: (MLR-8382)	S-NT815	Checks fuel tank vacuum relief valve opening pressure
Socket wrench	19 mm (0.75 in) More than 32 mm (1.26 in)	Removes and installs engine coolant temperature sensor

PREPARATION

< PREPARATION > [VK50VE]

Tool name (Kent-Moore No.)		Description	А
Oxygen sensor thread cleaner i.e.: (J-43897-18) (J-43897-12)	a Mating surface shave cylinder	Reconditions the exhaust system threads before installing a new oxygen sensor. Use with antiseize lubricant shown below. a: 18 mm diameter with pitch 1.5 mm for Zirconia Oxygen Sensor b: 12 mm diameter with pitch 1.25 mm for Tita-	EC
	FlutesAEM488	nia Oxygen Sensor	С
Anti-seize lubricant i.e.: (Permatex TM 133AR or equivalent meeting MIL specifica-		Lubricates oxygen sensor thread cleaning tool when reconditioning exhaust system threads.	D
tion MIL-A-907)			Е
	¥ S-NT779		F

G

Н

J

Κ

L

 \mathbb{N}

Ν

0

Р

PERIODIC MAINTENANCE

FUEL PRESSURE

Inspection INFOID:000000003959066

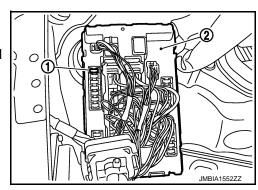
FUEL PRESSURE RELEASE

(P) With CONSULT-III

- 1. Turn ignition switch ON.
- 2. Perform "FUEL PRESSURE RELEASE" in "WORK SUPPORT" mode with CONSULT-III.
- 3. Start engine.
- 4. After engine stalls, crank it two or three times to release all fuel pressure.
- Turn ignition switch OFF.

Without CONSULT-III

- 1. Remove fuel pump fuse (1) located in IPDM E/R (2).
- Start engine.
- After engine stalls, crank it two or three times to release all fuel pressure.
- 4. Turn ignition switch OFF.
- 5. Reinstall fuel pump fuse after servicing fuel system.



FUEL PRESSURE CHECK

CAUTION:

Before disconnecting fuel line, release fuel pressure from fuel line to eliminate danger. NOTE:

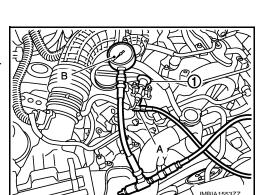
- Prepare pans or saucers under the disconnected fuel line because the fuel may spill out. The fuel pressure cannot be completely released because S51 models do not have fuel return system.
- Use Fuel Pressure Gauge Kit [SST:(J-44321)] to check fuel pressure.
- 1. Release fuel pressure to zero.
- Install the inline fuel quick disconnected fitting (A) between fuel damper (1) and injector tube.
- 3. Connect the fuel pressure test gauge (quick connector adapter hose) (B) to the inline fuel quick disconnected fitting.
- 4. Turn ignition switch ON and check for fuel leakage.
- 5. Start engine and check for fuel leakage.
- Read the indication of fuel pressure gauge.

At idling : Approximately 350 kPa (3.57 kg/cm², 51 psi)

If result is unsatisfactory, check fuel hoses and fuel tubes for clogging.

If OK, Replace "fuel filter and fuel pump assembly".

If NG, Repair or replace malfunctioning part.



EVAP LEAK CHECK

Inspection INFOID:000000003959067

CAUTION:

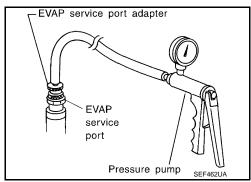
- Do not use compressed air or a high pressure pump.
- Do not exceed 4.12 kPa (0.042 kg/cm², 0.6 psi) of pressure in EVAP system. NOTE:

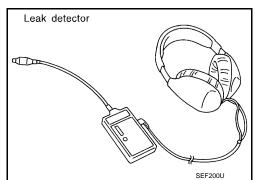
Do not start engine.

 Improper installation of EVAP service port adapter (commercial service tool) to the EVAP service port may cause a leak.

(P) WITH CONSULT-III

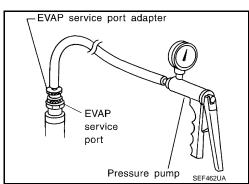
- 1. To locate the EVAP leak, install EVAP service port adapter (commercial service tool) and pressure pump to EVAP service port.
- 2. Turn ignition switch ON.
- 3. Select the "EVAP SYSTEM CLOSE" of "WORK SUPPORT" mode with CONSULT-III.
- 4. Touch "START". A bar graph (Pressure indicating display) will appear on the screen.
- 5. Apply positive pressure to the EVAP system until the pressure indicator reaches the middle of the bar graph.
- Remove EVAP service port adapter (commercial service tool) and hose with pressure pump.
- Locate the leak using a leak detector (commercial service tool).
 Refer to <u>EC-654, "System Diagram"</u>.





WITHOUT CONSULT-III

- To locate the EVAP leak, install EVAP service port adapter (commercial service tool) and pressure pump to EVAP service port.
- 2. Apply battery voltage between the terminals of EVAP canister vent control valve to make a closed EVAP system.
- To locate the leak, deliver positive pressure to the EVAP system until pressure gauge points reach 1.38 to 2.76 kPa (0.014 to 0.028 kg/cm², 0.2 to 0.4 psi).
- 4. Remove EVAP service port adapter (commercial service tool) and hose with pressure pump.



EC

Α

Е

D

_

Н

J

K

M

Ν

Р

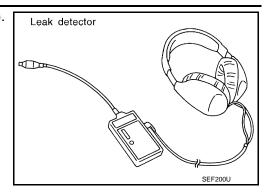
Revision: 2009 March EC-1229 2009 FX35/FX50

EVAP LEAK CHECK

< PERIODIC MAINTENANCE >

[VK50VE]

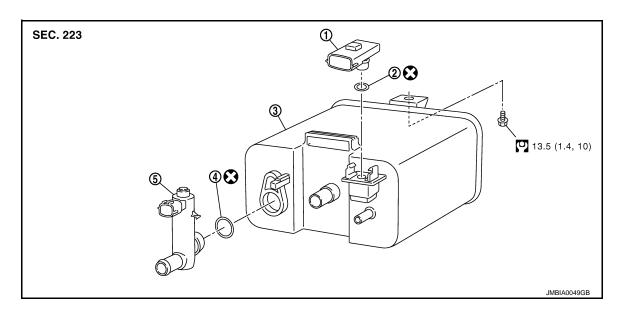
Locate the leak using a leak detector (commercial service tool).
 Refer to <u>EC-654, "System Diagram"</u>.



REMOVAL AND INSTALLATION

EVAP CANISTER

Exploded View EC



- 1. EVAP control system pressure sen- 2.
 - 2. O-ring

3. EVAP canister

4. O-ring

5. EVAP canister vent control valve

Refer to GI-3, "Contents" for symbols not described on the above.

Removal and Installation

REMOVAL

- 1. Lift up the vehicle.
- 2. Remove EVAP canister fixing bolt.
- 3. Remove EVAP canister.

NOTE:

The EVAP canister vent control valve and EVAP control system pressure sensor can be removed without removing the EVAP canister.

INSTALLATION

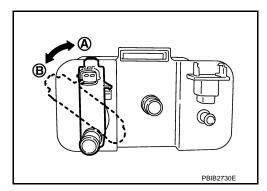
Install in the reverse order of removal.

NOTE:

Tighten EVAP canister fixing bolt to the specified torque.

DISASSEMBLY

- 1. Turn EVAP canister vent control valve counterclockwise.
 - Lock (A)
 - Unlock (B)
- Remove the EVAP canister vent control valve.



Α

D

Е

F

Н

K

INFOID:0000000003959069

M

0

Ν

Р

< REMOVAL AND INSTALLATION >

ASSEMBLY

Assemble in the reverse order of disassembly.

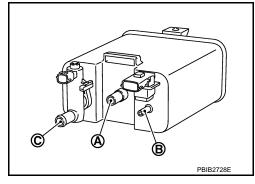
CAUTION:

Always replace O-ring with a new one.

Inspection INFOID:0000000003959070

Check EVAP canister as per the following:

- 1. Block port (B).
- 2. Blow air into port (A) and check that it flows freely out of port (C).
- 3. Release blocked port (B).
- 4. Apply vacuum pressure to port (B) and check that vacuum pressure exists at the ports (A) and (C).
- 5. Block port (A) and (B).
- 6. Apply pressure to port (C) and check that there is no leakage.



SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[VK50VE]

INFOID:0000000003959072

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Idle Speed

Condition	Specification
No load* (in P or N position)	650 ± 50 rpm

^{*:} Under the following conditions

- · A/C switch: OFF
- · Electric load: OFF (Lights, heater fan & rear window defogger)
- · Steering wheel: Kept in straight-ahead position

Ignition Timing

Condition	Specification
No load* (in P or N position)	15 ± 5°BTDC

^{*:} Under the following conditions

A/C switch: OFF

At 2,500 rpm

- Electric load: OFF (Lights, heater fan & rear window defogger)
- Steering wheel: Kept in straight-ahead position

Calculated Load Value

Condition Specification (Using CONSULT-III or GST)

At idle 5 – 35%

5 - 35%

Mass Air Flow Sensor

Supply voltage	Battery voltage (11 – 14 V)
Output voltage at idle	0.8 – 1.1 V*
Mass air flow (Using CONSULT-III or GST)	2.0 – 6.0 g·m/sec at idle* 7.0 – 20.0 g·m/sec at 2,500 rpm*

^{*:} Engine is warmed up to normal operating temperature and running under no load.

Α

EC

C

Е

D

F

G

| | INFOID:0000000003959073

INFOID:0000000003959074

K

M

Ν

Р