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M

CONTENTS

APPLICATION NOTICE15	Emission-related Diagnostic Information57
How to Check Vehicle Type15	IVIS (Infiniti Vehicle Immobilizer System — NATS) 71
•	Malfunction Indicator Lamp (MIL)71
TYPE 1	OBD System Operation Chart75
	TROUBLE DIAGNOSIS80
INDEX FOR DTC16	Trouble Diagnosis Introduction80
Alphabetical Index16	DTC Inspection Priority Chart83
DTC No. Index19	Fail-safe Chart85
PRECAUTIONS24	Basic Inspection86
Precautions for Supplemental Restraint System	Symptom Matrix Chart91
(SRS) "AIR BAG" and "SEAT BELT PRE-TEN-	Engine Control Component Parts Location 95
SIONER"	Circuit Diagram101
On Board Diagnostic (OBD) System of Engine and	ECM Harness Connector Terminal Layout 103
A/T	ECM Terminals and Reference Value 103
Precaution24	CONSULT-II Function111
Wiring Diagrams and Trouble Diagnosis 27	Generic Scan Tool (GST) Function 122
PREPARATION 28	CONSULT-II Reference Value in Data Monitor 125
Special Service Tools	Major Sensor Reference Graph in Data Monitor
Commercial Service Tools	Mode128
ENGINE CONTROL SYSTEM30	TROUBLE DIAGNOSIS - SPECIFICATION VALUE 131
System Diagram 30	Description131
Vacuum Hose Drawing31	Testing Condition131
System Chart32	Inspection Procedure131
Multiport Fuel Injection (MFI) System	Diagnostic Procedure132
Electronic Ignition (EI) System	TROUBLE DIAGNOSIS FOR INTERMITTENT INCI-
Air Conditioning Cut Control	DENT135
Fuel Cut Control (at No Load and High Engine	Description135
Speed)	Diagnostic Procedure135
CAN Communication 37	POWER SUPPLY CIRCUIT FOR ECM136
BASIC SERVICE PROCEDURE39	Wiring Diagram136
Idle Speed and Ignition Timing Check	Diagnostic Procedure137
Idle Speed/Ignition Timing/Idle Mixture Ratio	DTC U1000, U1001 CAN COMMUNICATION LINE 142
Adjustment 40	Description142
Accelerator Pedal Released Position Learning 51	On Board Diagnosis Logic142
Throttle Valve Closed Position Learning51	DTC Confirmation Procedure142
Idle Air Volume Learning51	Wiring Diagram143
Fuel Pressure Check53	Diagnostic Procedure144
ON BOARD DIAGNOSTIC (OBD) SYSTEM56	DTC P0011, P0021 IVT CONTROL145
Introduction 56	Description145
Two Trip Detection Logic 56	CONSULT-IIReference Value in Data Monitor Mode

	. 145	DTC Confirmation Procedure	191
On Board Diagnosis Logic	146	Wiring Diagram	192
DTC Confirmation Procedure	146	Diagnostic Procedure	193
Wiring Diagram	148	Component Inspection	194
Diagnostic Procedure	151	Removal and Installation	194
Component Inspection		DTC P0121 TP SENSOR	195
Removal and Installation	153	Component Description	195
DTC P0031, P0032, P0051, P0052 HO2S1 HE	ATER 154	CONSULT-II Reference Value in Data Monito	rMode
Description	154		.195
CONSULT-II Reference Value in Data Monito	rMode	On Board Diagnosis Logic	195
	. 154	DTC Confirmation Procedure	195
On Board Diagnosis Logic	154	Wiring Diagram	197
DTC Confirmation Procedure	155	Diagnostic Procedure	198
Wiring Diagram		Component Inspection	202
Diagnostic Procedure	159	Removal and Installation	202
Component Inspection		DTC P0122, P0123 TP SENSOR	203
Removal and Installation	161	Description	
DTC P0037, P0038, P0057, P0058 HO2S2 HE	ATER 162	DTC P0125 ECT SENSOR	204
Description		Component Description	
CONSULT-II Reference Value in Data Monito	rMode	On Board Diagnosis Logic	
	. 162	DTC Confirmation Procedure	205
On Board Diagnosis Logic		Diagnostic Procedure	
DTC Confirmation Procedure		Component Inspection	
Wiring Diagram		Removal and Installation	
Diagnostic Procedure	167	DTC P0127 IAT SENSOR	207
Component Inspection		Component Description	
Removal and Installation		On Board Diagnosis Logic	
DTC P0101 MAF SENSOR		DTC Confirmation Procedure	
Component Description		Diagnostic Procedure	
CONSULT-II Reference Value in Data Monito	rMode	Component Inspection	
	. 170	Removal and Installation	
On Board Diagnosis Logic		DTC P0128 THERMOSTAT FUNCTION	
DTC Confirmation Procedure		On Board Diagnosis Logic	
Overall Function Check		DTC Confirmation Procedure	
Wiring Diagram		Diagnostic Procedure	
Diagnostic Procedure		Component Inspection	
Component Inspection		Removal and Installation	
Removal and Installation		DTC P0132, P0152 HO2S1	
DTC P0102, P0103 MAF SENSOR		Component Description	
Component Description	178	CONSULT-II Reference Value in Data Monito	
CONSULT-II Reference Value in Data Monito		0.5.15:	.212
0.0.10	. 178	On Board Diagnosis Logic	
On Board Diagnosis Logic		DTC Confirmation Procedure	
DTC Confirmation Procedure		Wiring Diagram	
Wiring Diagram		Diagnostic Procedure	
Diagnostic Procedure		Component Inspection	
Component Inspection		Removal and Installation	
Removal and Installation		DTC P0133, P0153 HO2S1	
DTC P0112, P0113 IAT SENSOR		Component Description	
Component Description		CONSULT-IIReference Value in Data Monito	
On Board Diagnosis Logic		On Board Diagnasis Lastis	.221
DTC Confirmation Procedure		On Board Diagnosis Logic	
Wiring Diagram		DTC Confirmation Procedure	
Diagnostic Procedure		Overall Function Check	
Component Inspection		Wiring Diagram	
Removal and Installation		Diagnostic Procedure	
DTC P0117, P0118 ECT SENSOR Component Description		Component Inspection Removal and Installation	
On Board Diagnosis Logic		Nonovai anu motaliation	∠აა
OH DUATU DIAUTUSIS LUUTU	150		

F

CONSULT-IIReference Value in Data Monitor	Mode -
	. 29
On Board Diagnosis Logic	
DTC Confirmation Procedure	29
Wiring Diagram	29
Diagnostic Procedure	29
Component Inspection	29
Removal and Installation	
DTC P0222, P0223 TP SENSOR	
Component Description	
CONSULT-IIReferenceValueinDataMonitorN	
The state of the s	. 29
On Board Diagnosis Logic	_
DTC Confirmation Procedure	
Wiring Diagram	
Diagnostic Procedure	
Component Inspection	
Removal and Installation	
DTC P0226 APP SENSOR	
Component Description	
CONSULT-II Reference Value in Data Monitor	
	. 30
On Board Diagnosis Logic	
DTC Confirmation Procedure	
Wiring Diagram	
Diagnostic Procedure	
Component Inspection	
Removal and Installation	
DTC P0227, P0228 APP SENSOR	
Component Description	
CONSULT-IIReference Value in Data Monitor I	
	. 3′
On Board Diagnosis Logic	3′
DTC Confirmation Procedure	31
Wiring Diagram	
Diagnostic Procedure	31
Component Inspection	
Removal and Installation	31
DTC P0300 - P0306 MULTIPLE CYLINDER N	
FIRE, NO. 1 - 6 CYLINDER MISFIRE	
On Board Diagnosis Logic	31
DTC Confirmation Procedure	31
Diagnostic Procedure	
DTC P0327, P0328 KS	32
Component Description	32
On Board Diagnosis Logic	32
DTC Confirmation Procedure	32
Wiring Diagram	
Diagnostic Procedure	
Component Inspection	
Removal and Installation	
DTC P0335 CKP SENSOR (POS)	
Component Description	2.0

Component Inspection289

Removal and Installation289

DTC P0134, P0154 HO2S1234

On Board Diagnosis Logic		On Board Diagnosis Logic	376
DTC Confirmation Procedure	327	DTC Confirmation Procedure	377
Wiring Diagram	329	Diagnostic Procedure	377
Diagnostic Procedure	330	Component Inspection	378
Component Inspection	332	DTCP0452EVAPCONTROLSYSTEMPRESSU	RE
Removal and Installation	333	SENSOR	379
DTC P0340, P0345 CMP SENSOR (PHASE)	334	Component Description	379
Component Description	334	CONSULT-II Reference Value in Data Monitor Mon	ode
CONSULT-II Reference Value in Data Monitor M	ode		.379
	. 334	On Board Diagnosis Logic	379
On Board Diagnosis Logic	334	DTC Confirmation Procedure	
DTC Confirmation Procedure		Wiring Diagram	
Wiring Diagram		Diagnostic Procedure	
Diagnostic Procedure		Component Inspection	
Component Inspection		DTCP0453EVAPCONTROLSYSTEMPRESSU	
Removal and Installation		SENSOR	
DTC P0420, P0430 THREE WAY CATALYST FU		Component Description	
TION		CONSULT-II Reference Value in Data Monitor Me	
On Board Diagnosis Logic		CONCOLI III COLO I COLO VALGO III DALA MOTINO I MA	.385
DTC Confirmation Procedure		On Board Diagnosis Logic	
Overall Function Check		DTC Confirmation Procedure	
Diagnostic Procedure		Wiring Diagram	
DTC P0441 EVAP CONTROL SYSTEM		Diagnostic Procedure	
System Description		Component Inspection	
On Board Diagnosis Logic		DTC P0455 EVAP CONTROL SYSTEM	
DTC Confirmation Procedure		On Board Diagnosis Logic	
Overall Function Check		DTC Confirmation Procedure	
		Diagnostic Procedure	
Diagnostic Procedure DTC P0442 EVAP CONTROL SYSTEM		DTC P0456 EVAP CONTROL SYSTEM	
On Board Diagnosis Logic		On Board Diagnosis Logic	
DTC Confirmation Procedure		DTC Confirmation Procedure	
Diagnostic Procedure		Overall Function Check	
Component Inspection		Diagnostic Procedure	
DTC P0444, P0445 EVAP CANISTER PURGE V		Component Inspection	
UME CONTROL SOLENOID VALVE		DTC P0460 FUEL LEVEL SENSOR	
Description		Component Description	
CONSULT-II Reference Value in Data Monitor M		On Board Diagnosis Logic	
	. 363	DTC Confirmation Procedure	
On Board Diagnosis Logic		Wiring Diagram	
DTC Confirmation Procedure		Diagnostic Procedure	
Wiring Diagram		Removal and Installation	
Diagnostic Procedure		DTC P0461 FUEL LEVEL SENSOR	
Component Inspection		Component Description	
Removal and Installation		On Board Diagnosis Logic	
DTC P0447 EVAP CANISTER VENT CONTRO		Overall Function Check	
VALVE	369	DTC P0462, P0463 FUEL LEVEL SENSOR	418
Component Description	369	Component Description	418
CONSULT-II Reference Value in Data Monitor M	ode	On Board Diagnosis Logic	418
	. 369	DTC Confirmation Procedure	418
On Board Diagnosis Logic	369	Wiring Diagram	419
DTC Confirmation Procedure	370	Diagnostic Procedure	420
Wiring Diagram	371	Removal and Installation	
Diagnostic Procedure		DTC P0500 VSS	
Component Inspection	374	Description	423
DTCP0451EVAPCONTROLSYSTEMPRESSU	RE	On Board Diagnosis Logic	
SENSOR		DTC Confirmation Procedure	
Component Description		Overall Function Check	
CONSULT-II Reference Value in Data Monitor M		Diagnostic Procedure	
	. 376		·

_	\sim
	ι,

D

F

Н

M

RELAY4	60
Component Description4	60
CONSULT-IIReference Value in Data Monitor Mode	
. 4	160
On Board Diagnosis Logic4	
DTC Confirmation Procedure4	60
Wiring Diagram4	62
Diagnostic Procedure4	
DTC P1128 THROTTLE CONTROL MOTOR 4	
Component Description4	65
On Board Diagnosis Logic4	
DTC Confirmation Procedure4	
Wiring Diagram4	
Diagnostic Procedure4	
Component Inspection4	
Removal and Installation4	
DTC P1143, P1163 HO2S14	
Component Description4	
CONSULT-IIReference Value in Data Monitor Mode	
	170
On Board Diagnosis Logic4	70
DTC Confirmation Procedure4	71
Overall Function Check4	
Diagnostic Procedure4	
Component Inspection4	
Removal and Installation4	
DTC P1144, P1164 HO2S14	
Component Description4	
CONSULT-IIReference Value in Data Monitor Mode	
	176
On Board Diagnosis Logic4	
DTC Confirmation Procedure4	
Overall Function Check4	
Diagnostic Procedure4	
Component Inspection4	
Removal and Installation4	
DTC P1146, P1166 HO2S24	
Component Description4	
CONSULT-II Reference Value in Data Monitor Mode	
	183
On Board Diagnosis Logic4	
DTC Confirmation Procedure4	
Overall Function Check4	
Wiring Diagram4	
Diagnostic Procedure4	89

Diagnostic Procedure500

Description	425
On Board Diagnosis Logic	425
DTC Confirmation Procedure	
Diagnostic Procedure	426
DTC P0507 ISC SYSTEM	427
Description	427
On Board Diagnosis Logic	427
DTC Confirmation Procedure	427
Diagnostic Procedure	428
DTC P0550 PSP SENSOR	429
Component Description	429
CONSULT-II Reference Value in Data Monitor Mod	de
	. 429
On Board Diagnosis Logic	429
DTC Confirmation Procedure	429
Wiring Diagram	430
Diagnostic Procedure	431
Component Inspection	
DTC P0605 ECM	
Component Description	434
On Board Diagnosis Logic	434
DTC Confirmation Procedure	434
Diagnostic Procedure	
DTC P0650 MIL	
Component Description	
On Board Diagnosis Logic	
DTC Confirmation Procedure	
Wiring Diagram	
Diagnostic Procedure	
DTC P1065 ECM POWER SUPPLY	441
Component Description	441
On Board Diagnosis Logic	441 441
On Board Diagnosis Logic DTC Confirmation Procedure	441 441 441
On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram	441 441 441 442
On Board Diagnosis Logic	441 441 441 442 443
On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure DTC P1102 MAF SENSOR	441 441 441 442 443
On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure DTC P1102 MAF SENSOR Component Description	441 441 441 442 443 445
On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure DTC P1102 MAF SENSOR	441 441 441 442 443 445 de
On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure DTC P1102 MAF SENSOR Component Description CONSULT-II Reference Value in Data Monitor Mod	441 441 442 443 445 445 de . 445
On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure DTC P1102 MAF SENSOR Component Description CONSULT-II Reference Value in Data Monitor Mod	441 441 442 443 445 445 de . 445
On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure DTC P1102 MAF SENSOR Component Description CONSULT-II Reference Value in Data Monitor Mod On Board Diagnosis Logic DTC Confirmation Procedure	441 441 442 443 445 445 de 445 445
On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure DTC P1102 MAF SENSOR Component Description CONSULT-II Reference Value in Data Monitor Mod On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram	441 441 442 443 445 445 de 445 445 446
On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure DTC P1102 MAF SENSOR Component Description CONSULT-II Reference Value in Data Monitor Mod On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure	441 441 442 443 445 de 445 445 445 446 447
On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure DTC P1102 MAF SENSOR Component Description CONSULT-II Reference Value in Data Monitor Mod On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure Component Inspection	441 441 442 443 445 de 445 445 446 447 448
On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure DTC P1102 MAF SENSOR Component Description CONSULT-II Reference Value in Data Monitor Mod On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure Component Inspection Removal and Installation	441 441 442 443 445 de 445 445 446 447 448
On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure DTC P1102 MAF SENSOR Component Description CONSULT-II Reference Value in Data Monitor Mod On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure Component Inspection Removal and Installation DTC P1121 ELECTRIC THROTTLE CONTROL	441 441 442 443 445 de 445 445 446 447 448 450 450
On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure DTC P1102 MAF SENSOR Component Description CONSULT-II Reference Value in Data Monitor Mod On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure Component Inspection Removal and Installation DTC P1121 ELECTRIC THROTTLE CONTROL ACTUATOR	441 441 442 443 445 de 445 445 446 447 448 450 450
On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure DTC P1102 MAF SENSOR Component Description CONSULT-II Reference Value in Data Monitor Mod On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure Component Inspection Removal and Installation DTC P1121 ELECTRIC THROTTLE CONTROL ACTUATOR Component Description	441 441 442 443 445 445 445 446 447 448 450 450
On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure DTC P1102 MAF SENSOR Component Description CONSULT-II Reference Value in Data Monitor Mod On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure Component Inspection Removal and Installation DTC P1121 ELECTRIC THROTTLE CONTROL ACTUATOR Component Description On Board Diagnosis Logic	441 441 442 443 445 445 de 445 446 447 448 450 450 451
On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure DTC P1102 MAF SENSOR Component Description CONSULT-II Reference Value in Data Monitor Mod On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure Component Inspection Removal and Installation DTC P1121 ELECTRIC THROTTLE CONTROL ACTUATOR Component Description On Board Diagnosis Logic DTC Confirmation Procedure	441 441 442 443 445 445 de 445 446 447 448 450 450 451 451
On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure DTC P1102 MAF SENSOR Component Description CONSULT-II Reference Value in Data Monitor Mod On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure Component Inspection Removal and Installation DTC P1121 ELECTRIC THROTTLE CONTROL ACTUATOR Component Description On Board Diagnosis Logic DTC Confirmation Procedure	441 441 442 443 445 445 de 445 446 447 448 450 450 451 451
On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure DTC P1102 MAF SENSOR Component Description CONSULT-II Reference Value in Data Monitor Mod On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure Component Inspection Removal and Installation DTC P1121 ELECTRIC THROTTLE CONTROL ACTUATOR Component Description On Board Diagnosis Logic DTC Confirmation Procedure DTC Confirmation Procedure Diagnostic Procedure	441 441 442 443 445 445 445 445 446 447 448 450 450 451 451 451
On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure DTC P1102 MAF SENSOR Component Description CONSULT-II Reference Value in Data Monitor Mod On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure Component Inspection Removal and Installation DTC P1121 ELECTRIC THROTTLE CONTROL ACTUATOR Component Description On Board Diagnosis Logic DTC Confirmation Procedure DTC Confirmation Procedure Diagnostic Procedure Diagnostic Procedure Diagnostic Procedure DTC P1122 ELECTRIC THROTTLE CONTROL FUNCTION	441 441 442 443 445 de 445 445 446 447 448 450 451 451 451 451
On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure DTC P1102 MAF SENSOR Component Description CONSULT-II Reference Value in Data Monitor Mod On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure Component Inspection Removal and Installation DTC P1121 ELECTRIC THROTTLE CONTROL ACTUATOR Component Description On Board Diagnosis Logic DTC Confirmation Procedure Diagnostic Procedure DTC P1122 ELECTRIC THROTTLE CONTROL FUNCTION Description	441 441 442 443 445 de 445 445 445 446 447 448 450 451 451 451 451 452 453
On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure DTC P1102 MAF SENSOR Component Description CONSULT-II Reference Value in Data Monitor Mod On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure Component Inspection Removal and Installation DTC P1121 ELECTRIC THROTTLE CONTROL ACTUATOR Component Description On Board Diagnosis Logic DTC Confirmation Procedure Diagnostic Procedure DTC P1122 ELECTRIC THROTTLE CONTROL FUNCTION Description On Board Diagnosis Logic DTC P1122 ELECTRIC THROTTLE CONTROL FUNCTION Description On Board Diagnosis Logic	441 441 442 443 445 445 445 445 446 447 448 450 451 451 451 451 452 453 453
On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure DTC P1102 MAF SENSOR Component Description CONSULT-II Reference Value in Data Monitor Mod On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure Component Inspection Removal and Installation DTC P1121 ELECTRIC THROTTLE CONTROL ACTUATOR Component Description On Board Diagnosis Logic DTC Confirmation Procedure Diagnostic Procedure Diagnostic Procedure DTC P1122 ELECTRIC THROTTLE CONTROL FUNCTION Description On Board Diagnosis Logic DTC Confirmation Procedure DTC P1122 ELECTRIC THROTTLE CONTROL FUNCTION Description On Board Diagnosis Logic DTC Confirmation Procedure	441 441 442 443 445 445 de 445 445 446 447 448 450 451 451 451 451 453 453 453 453
On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure DTC P1102 MAF SENSOR Component Description CONSULT-II Reference Value in Data Monitor Mod On Board Diagnosis Logic DTC Confirmation Procedure Wiring Diagram Diagnostic Procedure Component Inspection Removal and Installation DTC P1121 ELECTRIC THROTTLE CONTROL ACTUATOR Component Description On Board Diagnosis Logic DTC Confirmation Procedure Diagnostic Procedure DTC P1122 ELECTRIC THROTTLE CONTROL FUNCTION Description On Board Diagnosis Logic DTC P1122 ELECTRIC THROTTLE CONTROL FUNCTION Description On Board Diagnosis Logic	441 441 442 443 445 445 de 445 445 446 447 448 450 451 451 451 451 453 453 453 453 453

DTC P0506 ISC SYSTEM 425

Component Inspection	502	DTC P1229 SENSOR POWER SUPPLY	538
Removal and Installation		On Board Diagnosis Logic	
DTC P1148, P1168 CLOSED LOOP CONTROL		DTC Confirmation Procedure	
On Board Diagnosis Logic	505	Wiring Diagram	539
DTC Confirmation Procedure		Diagnostic Procedure	540
Overall Function Check	505	DTC P1444 EVAP CANISTER PURGE VOLUME	Ξ
Diagnostic Procedure	506	CONTROL SOLENOID VALVE	
DTC P1211 TCS CONTROL UNIT		Description	542
Description	507	CONSULT-II Reference Value in Data Monitor Mod	de
On Board Diagnosis Logic			.542
DTC Confirmation Procedure		On Board Diagnosis Logic	543
Diagnostic Procedure		DTC Confirmation Procedure	
DTC P1212 TCS COMMUNICATION LINE		Wiring Diagram	
Description	508	Diagnostic Procedure	
On Board Diagnosis Logic		Component Inspection	
DTC Confirmation Procedure		Removal and Installation	
Diagnostic Procedure		DTC P1446 EVAP CANISTER VENT CONTROL	
DTC P1217 ENGINE OVER TEMPERATURE		VALVE	
Description		Component Description	
CONSULT-II Reference Value in Data Monitor Mo		CONSULT-II Reference Value in Data Monitor Mod	
	.510		.550
On Board Diagnosis Logic	510	On Board Diagnosis Logic	
Overall Function Check		DTC Confirmation Procedure	
Wiring Diagram		Wiring Diagram	
Diagnostic Procedure		Diagnostic Procedure	
Main 12 Causes of Overheating		Component Inspection	
Component Inspection		DTC P1464 FUEL LEVEL SENSOR	
DTC P1223, P1224 TP SENSOR		Component Description	
Component Description		On Board Diagnosis Logic	
CONSULT-II Reference Value in Data Monitor Mo		DTC Confirmation Procedure	
	.521	Wiring Diagram	
On Board Diagnosis Logic	_	Diagnostic Procedure	
DTC Confirmation Procedure		Removal and Installation	
Wiring Diagram		DTC P1564 ASCD STEERING SWITCH	
Diagnostic Procedure		Component Description	
Component Inspection		CONSULT-IIReference Value in Data Monitor Mod	
Removal and Installation			.560
DTC P1225 TP SENSOR		On Board Diagnosis Logic	
Component Description		DTC Confirmation Procedure	
On Board Diagnosis Logic		Wiring Diagram	
DTC Confirmation Procedure		Diagnostic Procedure	
Diagnostic Procedure		Component Inspection	
Removal and Installation		DTC P1572 ASCD BRAKE SWITCH	567
DTC P1226 TP SENSOR		Component Description	
Component Description		CONSULT-II Reference Value in Data Monitor Mod	
On Board Diagnosis Logic			.567
DTC Confirmation Procedure		On Board Diagnosis Logic	
Diagnostic Procedure		DTC Confirmation Procedure	
Removal and Installation		Wiring Diagram	
DTC P1227, P1228 APP SENSOR		Diagnostic Procedure	
Component Description		Component Inspection	
CONSULT-II Reference Value in Data Monitor Mo		DTC P1574 ASCD VEHICLE SPEED SENSOR	
2 3.13 2 1 toronor valuo in Data Monitor Mo	.532	Component Description	
On Board Diagnosis Logic		On Board Diagnosis Logic	
DTC Confirmation Procedure		DTC Confirmation Procedure	
Wiring Diagram		Diagnostic Procedure	
Diagnostic Procedure		DTC P1706 PNP SWITCH	
Component Inspection		Component Description	
Removal and Installation		CONSULT-II Reference Value in Data Monitor Mod	

= し	
_	ι.
)

F

Н

M

Α

631

CONSULT-IIReference Value in Data Monitor Mod	e
	.631
Wiring Diagram	632
Diagnostic Procedure	633
DATA LINK CONNECTOR	634
Wiring Diagram	634
EVAPORATIVE EMISSION SYSTEM	635
Description	635
Component Inspection	638
Removal and Installation	639
How to Detect Fuel Vapor Leakage	639
ON BOARD REFUELING VAPOR RECOVERY	
(ORVR)	642
System Description	
Diagnostic Procedure	643
Component Inspection	
POSITIVE CRANKCASE VENTILATION	648
Description	
Component Inspection	
AUTOMATIC SPEED CONTROL DEVICE (ASCD) 650
System Description	
Component Description	
SERVICE DATA AND SPECIFICATIONS (SDS) .	653
Fuel Pressure	
Idle Speed and Ignition Timing	
Calculated Load Value	
Mass Air Flow Sensor	
Intake Air Temperature Sensor	
Engine Coolant Temperature Sensor	
Heated Oxygen Sensor 1 Heater	
Heated Oxygen sensor 2 Heater	
Crankshaft Position Sensor (POS)	
Camshaft Position Sensor (PHASE)	
Throttle Control Motor	
Injector	
Fuel Pump	654
TYPE 2	
INDEX FOR DTC	655
Alphabetical Index	655
DTC No. Index	
PRECAUTIONS	663
Precautions for Supplemental Restraint System	
(SRS) "AIR BAG" and "SEAT BELT PRE-TEN-	
SIONER"	663
On Board Diagnostic (OBD) System of Engine an	
A/T	663

ASCD INDICATOR631

Component Description

INDEX FOR DTC	. 655
Alphabetical Index	. 655
DTC No. Index	. 659
PRECAUTIONS	. 663
Precautions for Supplemental Restraint System	
(SRS) "AIR BAG" and "SEAT BELT PRE-TEN-	
SIONER"	. 663
On Board Diagnostic (OBD) System of Engine and	d
A/T	663
Precaution	663
Wiring Diagrams and Trouble Diagnosis	. 666
PREPARATION	667
Special Service Tools	. 667
Commercial Service Tools	. 668
ENGINE CONTROL SYSTEM	. 669
System Diagram	. 669
Vacuum Hose Drawing	. 670
System Chart	. 671

. 578

On Board Diagnosis Logic578

DTC Confirmation Procedure 578 Overall Function Check 578 Wiring Diagram 580 Diagnostic Procedure 581 DTC P1805 BRAKE SWITCH 584 Description 584 CONSULT-II Reference Value in Data Monitor Mode

On Board Diagnosis Logic 584 DTC Confirmation Procedure 584 Wiring Diagram 585 Diagnostic Procedure 586 Component Inspection 588

IGNITION SIGNAL 589 Component Description 589 Wiring Diagram 590 Diagnostic Procedure 595

Removal and Installation 600 INJECTOR CIRCUIT 601

Component Description 601 CONSULT-II Reference Value in Data Monitor Mode

Wiring Diagram 602 Diagnostic Procedure 603 Component Inspection 606 Removal and Installation 606 START SIGNAL 607 CONSULT-II Reference Value in Data Monitor Mode

Wiring Diagram 608 Diagnostic Procedure 609 FUEL PUMP CIRCUIT611 Description611 CONSULT-II Reference Value in Data Monitor Mode

Wiring Diagram 612 Diagnostic Procedure 613 Component Inspection 616

Removal and Installation 616 REFRIGERANT PRESSURE SENSOR 617 Component Description 617

Wiring Diagram 618 Removal and Installation 621 ELECTRICAL LOAD SIGNAL622 Description 622 CONSULT-II Reference Value in Data Monitor Mode

ASCD BRAKE SWITCH 623

Component Description 623 CONSULT-II Reference Value in Data Monitor Mode

Wiring Diagram 624 Diagnostic Procedure 625 Component Inspection 629

Multiport Fuel Injection (MFI) System	672	DTC Confirmation Procedure	792
Electronic Ignition (EI) System	674	Diagnostic Procedure	
Air Conditioning Cut Control	675	DTC P0031, P0032, P0051, P0052 HO2S1	HEATER 794
Fuel Cut Control (at No Load and High Engine)	Description	794
Speed)	675	CONSULT-IIReference Value in Data Mon	iitorMode
CAN communication	676		.794
BASIC SERVICE PROCEDURE	680	On Board Diagnosis Logic	794
Idle Speed and Ignition Timing Check	680	DTC Confirmation Procedure	
Idle Speed/Ignition Timing/Idle Mixture Ratio		Wiring Diagram	796
Adjustment	681	Diagnostic Procedure	
Accelerator Pedal Released Position Learning		Component Inspection	
Throttle Valve Closed Position Learning	•	Removal and Installation	
Idle Air Volume Learning		DTC P0037, P0038, P0057, P0058 HO2S2	
Fuel Pressure Check		Description	
ON BOARD DIAGNOSTIC (OBD) SYSTEM		CONSULT-II Reference Value in Data Mon	
Introduction			.802
Two Trip Detection Logic		On Board Diagnosis Logic	802
Emission-related Diagnostic Information		DTC Confirmation Procedure	
IVIS (Infiniti Vehicle Immobilizer System — NA		Wiring Diagram	
Malfunction Indicator Lamp (MIL)		Diagnostic Procedure	
OBD System Operation Chart		Component Inspection	
TROUBLE DIAGNOSIS		Removal and Installation	
Trouble Diagnosis Introduction		DTC P0101 MAF SENSOR	
DTC Inspection Priority Chart		Component Description	
Fail-safe Chart		CONSULT-II Reference Value in Data Mon	
Basic Inspection		CONCOLT III CICIONOC VAIGONI DALAMON	.810
Symptom Matrix Chart		On Board Diagnosis Logic	
Engine Control Component Parts Location		DTC Confirmation Procedure	
Circuit Diagram		Overall Function Check	
ECM Harness Connector Terminal Layout		Wiring Diagram	
ECM Terminals and Reference Value		Diagnostic Procedure	
CONSULT-II Function		Component Inspection	
Generic Scan Tool (GST) Function		Removal and Installation	
CONSULT-II Reference Value in Data Monitor		DTC P0102, P0103 MAF SENSOR	
Major Sensor Reference Graph in Data Monitor		Component Description	
Mode		CONSULT-II Reference Value in Data Mon	
TROUBLE DIAGNOSIS - SPECIFICATION VAL		CONSOLT-III elefence value iii Dala Mon	.818
Description	776	On Board Diagnosis Logic	
Testing Condition		DTC Confirmation Procedure	
Inspection Procedure		Wiring Diagram	
Diagnostic Procedure		Diagnostic Procedure	
TROUBLE DIAGNOSIS FOR INTERMITTENT IN			
DENT		Component Inspection Removal and Installation	
Description		DTC P0112, P0113 IAT SENSOR	
Diagnostic Procedure		•	
POWER SUPPLY CIRCUIT FOR ECM		Component Description	
		On Board Diagnosis Logic DTC Confirmation Procedure	
Wiring Diagram			
Diagnostic Procedure	/ 04	Wiring Diagram	
DTC U1000, U1001 CAN COMMUNICATION LI		Diagnostic Procedure	
Description		Component Inspection	
On Board Diagnosis Logic		Removal and Installation	
DTC Confirmation Procedure		DTC P0117, P0118 ECT SENSOR	
Wiring Diagram		Component Description	
Diagnostic Procedure		On Board Diagnosis Logic	
DTC P0011, P0021 IVT CONTROL		DTC Confirmation Procedure	
Description		Wiring Diagram	
CONSULT-II Reference Value in Data Monitor Mo		Diagnostic Procedure	
	. 791	Component Inspection	
On Board Diagnosis Logic	792	Removal and Installation	834

	. 835	DTC P0138, P0158 HO252	883
On Board Diagnosis Logic	835	Component Description	
DTC Confirmation Procedure	836	CONSULT-IIReference Value in Data Mo	nitorMode
Wiring Diagram			. 883
Diagnostic Procedure	838	On Board Diagnosis Logic	
Component Inspection	841	DTC Confirmation Procedure	884
Removal and Installation	841	Wiring Diagram	885
DTC P0125 ECT SENSOR	842	Diagnostic Procedure	888
Component Description	842	Component Inspection	891
On Board Diagnosis Logic	842	Removal and Installation	892
DTC Confirmation Procedure		DTC P0139, P0159 HO2S2	893
Diagnostic Procedure	843	Component Description	893
Component Inspection	844	CONSULT-IIReference Value in Data Mo	
Removal and Installation			. 893
DTC P0127 IAT SENSOR	845	On Board Diagnosis Logic	893
Component Description	845	DTC Confirmation Procedure	
On Board Diagnosis Logic		Overall Function Check	894
DTC Confirmation Procedure		Wiring Diagram	
Diagnostic Procedure		Diagnostic Procedure	
Component Inspection		Component Inspection	
Removal and Installation		Removal and Installation	
DTC P0128 THERMOSTAT FUNCTION		DTC P0171, P0174 FUEL INJECTION S	
On Board Diagnosis Logic		FUNCTION	
DTC Confirmation Procedure		On Board Diagnosis Logic	
Diagnostic Procedure		DTC Confirmation Procedure	
Component Inspection		Wiring Diagram	
Removal and Installation		Diagnostic Procedure	
DTC P0132, P0152 HO2S1		DTC P0172, P0175 FUEL INJECTION S	
Component Description		FUNCTION	
CONSULT-II Reference Value in Data Monitor Mo		On Board Diagnosis Logic	
CONCOLI III CICICICE VAIGCII DALAMOIII OI MC	. 850	DTC Confirmation Procedure	
On Board Diagnosis Logic		Wiring Diagram	
DTC Confirmation Procedure		Diagnostic Procedure	
Wiring Diagram		DTC P0181 FTT SENSOR	
Diagnostic Procedure		Component Description	
Component Inspection		On Board Diagnosis Logic	
Removal and Installation		DTC Confirmation Procedure	
DTC P0133, P0153 HO2S1		Wiring Diagram	
Component Description		Diagnostic Procedure	
CONSULT-II Reference Value in Data Monitor Mo		Component Inspection	
CONSOLI-III (elelelice value il Data Mollito) MC	. 860	Removal and Installation	
On Board Diagnosis Logic		DTC P0182, P0183 FTT SENSOR	
DTC Confirmation Procedure			
Overall Function Check		Component Description On Board Diagnosis Logic	
		DTC Confirmation Procedure	
Wiring Diagram			
Diagnostic Procedure		Wiring Diagram	
Component Inspection		Diagnostic Procedure	
Removal and Installation		Component Inspection	
DTC P0134, P0154 HO2S1		Removal and Installation	
Component Description		DTC P0222, P0223 TP SENSOR	
CONSULT-II Reference Value in Data Monitor Mo		Component Description	
On Donal Diamental Leaf	. 873	CONSULT-IIReference Value in Data Mo	
On Board Diagnosis Logic		O. B. and Birman in the si	. 931
DTC Confirmation Procedure		On Board Diagnosis Logic	
Overall Function Check		DTC Confirmation Procedure	
Wiring Diagram	8/6	Wiring Diagram	933
Revision; 2004 April	EC	-9 20	003 G35 Sedan

Diagnostic Procedure879

Component Inspection880

Removal and Installation882

DTC P0122, P0123 TP SENSOR835

CONSULT-II Reference Value in Data Monitor Mode

Component Description 835

Diagnostic Procedure	934	DTC Confirmation Procedure	985
Component Inspection	937	Wiring Diagram	986
Removal and Installation		Diagnostic Procedure	
DTC P0300 - P0306 MULTIPLE CYLINDER MIS		Component Inspection	
FIRE, NO. 1 - 6 CYLINDER MISFIRE		Removal and Installation	
On Board Diagnosis Logic		DTC P0447 EVAP CANISTER VENT CONT	
DTC Confirmation Procedure		VALVE	
Diagnostic Procedure		Component Description	
DTC P0327, P0328 KS		CONSULT-II Reference Value in Data Monito	
Component Description			.991
On Board Diagnosis Logic		On Board Diagnosis Logic	
DTC Confirmation Procedure		DTC Confirmation Procedure	
Wiring Diagram		Wiring Diagram	
Diagnostic Procedure		Diagnostic Procedure	
Component Inspection		Component Inspection	
Removal and Installation		DTCP0451EVAPCONTROLSYSTEMPRES	
DTC P0335 CKP SENSOR (POS)		SENSOR	
Component Description		Component Description	
CONSULT-II Reference Value in Data Monitor Mo		CONSULT-II Reference Value in Data Monito	
CONSOLI-II Reference value in Data Monitor Mi	. 949	CONSOLT-ITREFERENCE VALUE IT DATA MOTHIC	
On Board Diagnosis Logic		On Board Diagnosis Logis	.998
On Board Diagnosis Logic		On Board Diagnosis Logic	
DTC Confirmation Procedure		DTC Confirmation Procedure	
Wiring Diagram		Diagnostic Procedure	
Diagnostic Procedure		Component Inspection	
Component Inspection		DTCP0452EVAPCONTROLSYSTEMPRES	
Removal and Installation		SENSOR	
DTC P0340, P0345 CMP SENSOR (PHASE)		Component Description	
Component Description		CONSULT-II Reference Value in Data Monito	
CONSULT-II Reference Value in Data Monitor Mo	ode		1001
	. 955	On Board Diagnosis Logic	
On Board Diagnosis Logic	955	DTC Confirmation Procedure	1002
DTC Confirmation Procedure	955	Wiring Diagram	1003
Wiring Diagram	957	Diagnostic Procedure	1004
Diagnostic Procedure	960	Component Inspection	1006
Component Inspection	963	DTCP0453EVAPCONTROLSYSTEMPRES	SURE
Removal and Installation		SENSOR	1007
DTC P0420, P0430 THREE WAY CATALYST FUI	NC-	Component Description	1007
TION		CONSULT-II Reference Value in Data Monito	rMode
On Board Diagnosis Logic	964		1007
DTC Confirmation Procedure		On Board Diagnosis Logic	1007
Overall Function Check		DTC Confirmation Procedure	
Diagnostic Procedure		Wiring Diagram	
DTC P0441 EVAP CONTROL SYSTEM		Diagnostic Procedure	
System Description		Component Inspection	
On Board Diagnosis Logic		DTC P0455 EVAP CONTROL SYSTEM	
DTC Confirmation Procedure		On Board Diagnosis Logic	
Overall Function Check		DTC Confirmation Procedure	
Diagnostic Procedure		Diagnostic Procedure	
DTC P0442 EVAP CONTROL SYSTEM		DTC P0456 EVAP CONTROL SYSTEM	
On Board Diagnosis Logic		On Board Diagnosis Logic	
DTC Confirmation Procedure		DTC Confirmation Procedure	
		Overall Function Check	
Diagnostic Procedure			
Component Inspection		Diagnostic Procedure	
DTC P0444, P0445 EVAP CANISTER PURGE VO		Component Inspection	1032
UME CONTROL SOLENOID VALVE		DTC P0460 FUEL LEVEL SENSOR	
Description		Component Description	
CONSULT-II Reference Value in Data Monitor Mo		On Board Diagnosis Logic	
	. 984	DTC Confirmation Procedure	1033
On Board Diagnosis Logic	985		

_	•	
	v	
		-

Component Inspection1063

Removal and Installation1063

ACTUATOR1064

Component Description1064

On Board Diagnosis Logic1064

DTC Confirmation Procedure1064

Diagnostic Procedure1065

FUNCTION1066

On Board Diagnosis Logic1066

DTC Confirmation Procedure1066

Wiring Diagram1067

Diagnostic Procedure1068

Component Inspection1071

Remove and Installation1071
DTC P1124. P1126 THROTTLE CONTROL MOTOR

RELAY1072

CONSULT-IIReference Value in Data Monitor Mode

Component Description1072

On Board Diagnosis Logic1072

DTC Confirmation Procedure1072

Wiring Diagram1074

Diagnostic Procedure1075
DTC P1128 THROTTLE CONTROL MOTOR1077

Component Description1077

On Board Diagnosis Logic1077

DTC Confirmation Procedure1077

Wiring Diagram1078

Diagnostic Procedure1079

DTC P1143, P1163 HO2S11082

On Board Diagnosis Logic1082

DTC Confirmation Procedure1083

Overall Function Check1084

Diagnostic Procedure1084

Component Inspection1086

Removal and Installation1087

Component Description1088
CONSULT-IIReference Value in Data Monitor Mode

On Board Diagnosis Logic1088

DTC Confirmation Procedure1089

DTC P1144, P1164 HO2S11088

DTC P1121 ELECTRIC THROTTLE CONTROL

DTC P1122 ELECTRIC THROTTLE CONTROL

	D

	_	
(4	
`	_	

l		

(
/		

_		

ı	J	١	
١	/		

Component Description	1057	Component Inspection	1092
CONSULT-II Reference Value in Data Mo	onitorMode	Removal and Installation	1094
	1057	DTC P1146, P1166 HO2S2	1095
On Board Diagnosis Logic	1057	Component Description	1095
DTC Confirmation Procedure	1057	CONSULT-II Reference Value in Data N	1onitorMode
Wiring Diagram	1058		1095
		On Board Diagnosis Logic	1095

Diagnostic Procedure1034

Removal and Installation1034

On Board Diagnosis Logic1035

Overall Function Check1035

Diagnostic Procedure1036

Removal and Installation1036

Component Description1037

On Board Diagnosis Logic1037

DTC Confirmation Procedure1037

Diagnostic Procedure1038

Removal and Installation1038

Description1039

On Board Diagnosis Logic1039

Description1041
On Board Diagnosis Logic1041

DTC Confirmation Procedure1041

Diagnostic Procedure1042

DTC Confirmation Procedure1043

Diagnostic Procedure1044

Component Description1045

On Board Diagnosis Logic1045

DTC Confirmation Procedure1045

Component Description1050

On Board Diagnosis Logic1050

DTC Confirmation Procedure1050

Diagnostic Procedure1051

Component Description1053

Diagnostic Procedure1055

VALVE1057

DTC P1111, P1136 IVT CONTROL SOLENOID

DTC P1065 ECM POWER SUPPLY1053

DTC P0550 PSP SENSOR1045

CONSULT-II Reference Value in Data Monitor Mode

DTC P0507 ISC SYSTEM1043

DTC P0506 ISC SYSTEM1041

DTC P0500 VSS1039

DTC P0462 FUEL LEVEL SENSOR1037

DTC Confirmation Procedure	1096	Diagnostic Procedure	1148
Overall Function Check	1096	Removal and Installation	1148
Wiring Diagram	1098	DTC P1226 TP SENSOR	1149
Diagnostic Procedure	1101	Component Description	1149
Component Inspection		On Board Diagnosis Logic	1149
Removal and Installation		DTC Confirmation Procedure	
DTC P1147, P1167 HO2S2		Diagnostic Procedure	
Component Description		Removal and Installation	
CONSULT-II Reference Value in Data Monitor		DTC P1229 SENSOR POWER SUPPLY	
	1107	On Board Diagnosis Logic	
On Board Diagnosis Logic	_	DTC Confirmation Procedure	
DTC Confirmation Procedure		Wiring Diagram	
Overall Function Check		Diagnostic Procedure	
Wiring Diagram		DTC P1444 EVAP CANISTER PURGE VOLUM	
Diagnostic Procedure		CONTROL SOLENOID VALVE	
Component Inspection		Description	
Removal and Installation		CONSULT-II Reference Value in Data Monitor Mo	
		CONSULT-ITRETETETICE VALUE IT DATA MOTITION MIC	
DTC P1148, P1168 CLOSED LOOP CONTRO		On Doord Diamonia Logia	1156
On Board Diagnosis Logic		On Board Diagnosis Logic	
DTC Confirmation Procedure		DTC Confirmation Procedure	
Overall Function Check		Wiring Diagram	
Diagnostic Procedure		Diagnostic Procedure	
DTC P1211 TCS CONTROL UNIT		Component Inspection	
Description		Removal and Installation	
On Board Diagnosis Logic		DTC P1446 EVAP CANISTER VENT CONTRO	
DTC Confirmation Procedure		VALVE	
Diagnostic Procedure		Component Description	
DTC P1212 TCS COMMUNICATION LINE		CONSULT-II Reference Value in Data Monitor Mo	ode
Description			1164
On Board Diagnosis Logic		On Board Diagnosis Logic	
DTC Confirmation Procedure	1122	DTC Confirmation Procedure	1165
Diagnostic Procedure	1122	Wiring Diagram	1166
DTC P1217 ENGINE OVER TEMPERATURE	(FOR	Diagnostic Procedure	1167
A/T MODELS)	1123	Component Inspection	1169
Description	1123	DTC P1564 ASCD STEERING SWITCH	1171
CONSULT-II Reference Value in Data Monitor	Mode	Component Description	
	1124	CONSULT-II Reference Value in Data Monitor Mo	ode
On Board Diagnosis Logic	1124		1171
Overall Function Check		On Board Diagnosis Logic	1171
Wiring Diagram		DTC Confirmation Procedure	
Diagnostic Procedure		Wiring Diagram	
Main 12 Causes of Overheating		Diagnostic Procedure	
Component Inspection		Component Inspection	
DTC P1217 ENGINE OVER TEMPERATURE		DTC P1572 ASCD BRAKE SWITCH	1178
M/T MODELS)		Component Description	
Description		CONSULT-II Reference Value in Data Monitor Mo	
CONSULT-II Reference Value in Data Monitor		CONCEL INCOLORO VALGO IN BALANO INCOLNIC	1178
CONTROLL INVOICEMENT VALGORIDATE INTOINE	1136	On Board Diagnosis Logic	_
On Board Diagnosis Logic		DTC confirmation Procedure	
Overall Function Check		Wiring Diagram	
		Diagnostic Procedure	
Wiring Diagram			
Diagnostic Procedure		Component Inspection	
Main 12 Causes of Overheating		DTC P1574 ASCD VEHICLE SPEED SENSOR	
Component Inspection		Component Description	
DTC P1225 TP SENSOR		On Board Diagnosis Logic	
Component Description		DTC Confirmation Procedure	
On Board Diagnosis Logic		Diagnostic Procedure	
DTC Confirmation Procedure	1147	DTC P1706 PNP SWITCH	
		Component Description	

1253

Α

F

D

Н

2003 G35 Sedan

CONSULT-II Reference Value in Data Moni	torMode
	1259
Wiring Diagram	1260
Diagnostic Procedure	
Component Inspection	
Removal and Installation	1264
REFRIGERANT PRESSURE SENSOR	1265
Component Description	1265
Wiring Diagram	1266
Diagnostic Procedure	1267
Removal and Installation	1269
ELECTRICAL LOAD SIGNAL	1270
Description	1270
CONSULT-II Reference Value in Data Moni	torMode
	1270
Diagnostic Procedure	1270
ASCD BRAKE SWITCH	1271
Component Description	
CONSULT-II Reference Value in Data Moni	torMode
	1271
Wiring Diagram	1272
Diagnostic Procedure	
Component Inspection	
ASCD INDICATOR	_
Component Description	
CONSULT-II Reference Value in Data Moni	torMode
	1287
Wiring Diagram	1288
Diagnostic Procedure	1289
MIL AND DATA LINK CONNECTOR	
Wiring Diagram	1290
EVAPORATIVE EMISSION SYSTEM	
Description	1292
Component Inspection	1295
Removal and Installation	
How to Detect Fuel Vapor Leakage	
ON BOARD REFUELING VAPOR RECOV	
(ORVR)	
System Description	
Diagnostic Procedure	
Component Inspection	
POSITIVE CRANKCASE VENTILATION .	
Description	
Component Inspection	1305

Component Description1253
CONSULT-IIReference Value in Data Monitor Mode

FUEL PUMP CIRCUIT1259

Description

		1197
	On Board Diagnosis Logic	
	DTC Confirmation Procedure	
	Overall Function Check	
	Wiring Diagram	1199
	Diagnostic Procedure	
D	TC P1805 BRAKE SWITCH	
	Description	
	CONSULT-II Reference Value in Data Monitor Mod	
		1206
	On Board Diagnosis Logic	1206
	DTC Confirmation Procedure	
	Wiring Diagram	
	Diagnostic Procedure	
	Component Inspection	
ח	TC P2122, P2123 APP SENSOR	
ט	Component Description	
	CONSULT-II Reference Value in Data Monitor Mod	
	CONSULT-II Reference value in Data Monitor Mod	
	On Board Biomonia Lania	1211
	On Board Diagnosis Logic	
	DTC Confirmation Procedure	
	Wiring Diagram	
	Diagnostic Procedure	
	Component Inspection	
	Removal and Installation	
D	TC P2127, P2128 APP SENSOR	
	Component Description	
	CONSULT-II Reference Value in Data Monitor Mod	le
		1218
	On Board Diagnosis Logic	.1218
	DTC Confirmation Procedure	
	Wiring Diagram	.1220
	Diagnostic Procedure	.1221
	Component Inspection	.1224
	Removal and Installation	.1224
D	TC P2135 TP SENSOR	.1225
	Component Description	.1225
	CONSULT-II Reference Value in Data Monitor Mod	le
		1225
	On Board Diagnosis Logic	.1225
	DTC Confirmation Procedure	
	Wiring Diagram	
	Diagnostic Procedure	
	Component Inspection	
	Removal and Installation	
ח	TC P2138 APP SENSOR	
_	Component Description	
	CONSULT-II Reference Value in Data Monitor Mod	
	CONSOLI-III (elelelice value il Data Mollito) Moc	1232
	On Board Diagnosis Logic	
	On Board Diagnosis Logic DTC Confirmation Procedure	
	Wiring Diagram	
	Diagnostic Procedure	
	Component Inspection	
	Removal and Installation	
IC	SNITION SIGNAL	
	Component Description	.1241

Revision; 2004 April

CONSULT-II Reference Value in Data Monitor Mode

AUTOMATIC SPEED CONTROL DEVICE (ASCD) 1307	Engine Coolant Temperature Sensor	1310
System Description1307	Heated Oxygen Sensor 1 Heater	1310
Component Description1309	Heated Oxygen sensor 2 Heater	1310
SERVICE DATA AND SPECIFICATIONS (SDS)1310	Crankshaft Position Sensor (POS)	1310
Fuel Pressure1310	Camshaft Position Sensor (PHASE)	1310
Idle Speed and Ignition Timing1310	Throttle Control Motor	1311
Calculated Load Value1310	Injector	1311
Mass Air Flow Sensor1310	Fuel Pump	1311
Intake Air Temperature Sensor1310	•	

APPLICATION NOTICE

APPLICATION NOTICE

PFP:00000

How to Check Vehicle Type

ABS00940

Check the transmission and vehicle serial number to confirm the service information in EC section.

Transmission	Vehicle serial number	Service information
A/T	Up to serial 329287 except 327918, 327920, 327976, 327978, 328979, 329004, 329025, 329078	TYPE 1
AVI	For serial 327918, 327920, 327976, 327978, 328979, 329004, 329025, 329078 and from serial 329288	TYPE 2
M/T	-	

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M

INDEX FOR DTC

PFP:00024

Alphabetical Index

ABS00033

NOTE:

If DTC U1000 or U1001 is displayed with other DTC, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-142, "DTC U1000, U1001 CAN COMMUNICATION LINE".

×:Applicable —: Not applicable

Items	DTO	DTC*1		MIL lighting	
(CONSULT-II screen terms)	CONSULT-II GST* ²	ECM*3	Trip	up	Reference page
A/T INTERLOCK	P1730	1730	1	×	<u>AT-168</u>
A/T TCC S/V FNCTN	P0744	0744	2	×	<u>AT-127</u>
APP SEN 1/CIRC	P0227	0227	1	×	EC-311
APP SEN 1/CIRC	P0228	0228	1	×	EC-311
APP SEN 2/CIRC	P1227	1227	1	×	EC-532
APP SEN 2/CIRC	P1228	1228	1	×	EC-532
APP SENSOR	P0226	0226	1	×	EC-304
ASCD BRAKE SW	P1572	1572	2	_	EC-567
ASCD SW	P1564	1564	2	_	EC-560
ASCD VHL SPD SEN	P1574	1574	2	_	EC-576
ATF TEMP SEN/CIRC	P0710	0710	2	×	<u>AT-155</u>
BRAKE SW/CIRCUIT	P1805	1805	2	_	EC-584
CAN COMM CIRCUIT	U1000	1000* ⁵	1	×	EC-142
CAN COMM CIRCUIT	U1001	1001* ⁵	2	_	EC-142
CKP SEN/CIRCUIT	P0335	0335	2	×	EC-327
CLOSED LOOP-B1	P1148	1148	1	×	EC-505
CLOSED LOOP-B2	P1168	1168	1	×	EC-505
CMP SEN/CIRC-B1	P0340	0340	2	×	EC-334
CMP SEN/CIRC-B2	P0345	0345	2	×	EC-334
CTP LEARNING	P1225	1225	2	_	EC-528
CTP LEARNING	P1226	1226	2	_	EC-530
CYL 1 MISFIRE	P0301	0301	2	×	EC-317
CYL 2 MISFIRE	P0302	0302	2	×	EC-317
CYL 3 MISFIRE	P0303	0303	2	×	EC-317
CYL 4 MISFIRE	P0304	0304	2	×	EC-317
CYL 5 MISFIRE	P0305	0305	2	×	EC-317
CYL 6 MISFIRE	P0306	0306	2	×	EC-317
D/C SOLENOID/CIRC	P1762	1762	1	×	<u>AT-198</u>
D/C SOLENOID FNCTN	P1764	1764	1	×	<u>AT-203</u>
ECM	P0605	0605	1 or 2	× or —	EC-434
ECM BACK UP/CIRCUIT	P1065	1065	2	×	EC-441
ECT SEN/CIRCUIT	P0117	0117	1	×	EC-190
ECT SEN/CIRCUIT	P0118	0118	1	×	EC-190
ECT SENSOR	P0125	0125	1	×	EC-204
ENG OVER TEMP	P1217	1217	1	×	EC-509
ENGINE SPEED SIG	P0725	0725	2	×	<u>AT-120</u>
ETC ACTR	P1121	1121	1	×	EC-451

INDEX FOR DTC

[TYPE 1]

	DTC* ¹			NAIL P. L.C.	
Items (CONSULT-II screen terms)	CONSULT-II GST* ²	ECM* ³	Trip	MIL lighting up	Reference page
ETC FUNCTION/CIRC	P1122	1122	1	×	<u>EC-453</u>
ETC MOT	P1128	1128	1	×	EC-465
ETC MOT PWR	P1124	1124	1	×	EC-460
ETC MOT PWR	P1126	1126	1	×	EC-460
EVAP GROSS LEAK	P0455	0455	2	×	EC-393
EVAP PURG FLOW/MON	P0441	0441	2	×	EC-348
EVAP SMALL LEAK	P0442	0442	2	×	EC-353
EVAP SYS PRES SEN*7	P0451* ⁸	0451* ⁸	2	×	EC-376
EVAP SYS PRES SEN	P0452	0452	2	×	EC-379
EVAP SYS PRES SEN	P0453	0453	2	×	EC-385
EVAP VERY SML LEAK	P0456	0456	2	×	EC-401
FR/B SOLENOID/CIRC	P1757	1757	1	×	<u>AT-188</u>
FR/B SOLENOID FNCT	P1759	1759	1	×	<u>AT-193</u>
FTT SEN/CIRCUIT	P0182	0182	2	×	EC-286
FTT SEN/CIRCUIT	P0183	0183	2	×	EC-286
FTT SENSOR	P0181	0181	2	×	EC-281
FUEL LEV SEN SLOSH	P0460	0460	2	×	EC-411
FUEL LEVEL SENSOR	P0461	0461	2	×	EC-416
FUEL LEVL SEN/CIRC	P0462	0462	2	×	EC-418
FUEL LEVL SEN/CIRC	P0463	0463	2	×	EC-418
FUEL LEVL SEN/CIRC	P1464	1464	2	×	EC-557
FUEL SYS-LEAN-B1	P0171	0171	2	×	EC-264
FUEL SYS-LEAN-B2	P0174	0174	2	×	EC-264
FUEL SYS-RICH-B1	P0172	0172	2	×	EC-273
FUEL SYS-RICH-B2	P0175	0175	2	×	EC-273
HLR/C SOL FNCTN	P1769	1769	1	×	AT-212
HLR/C SOL/CIRC	P1767	1767	1	×	AT-207
HO2S1 (B1)	P0132	0132	2	×	EC-212
HO2S1 (B1)	P0133	0133	2	×	EC-221
HO2S1 (B1)	P0134	0134	2	×	EC-234
HO2S1 (B1)	P1143	1143	2	×	EC-470
HO2S1 (B1)	P1144	1144	2	×	EC-476
HO2S1 (B2)	P0152	0152	2	×	EC-212
HO2S1 (B2)	P0153	0153	2	×	EC-221
HO2S1 (B2)	P0154	0154	2	×	EC-234
HO2S1 (B2)	P1163	1163	2	×	EC-470
HO2S1 (B2)	P1164	1164	2	×	EC-476
HO2S1 HTR (B1)	P0031	0031	2	×	EC-154
HO2S1 HTR (B1)	P0032	0032	2	×	EC-154
HO2S1 HTR (B2)	P0051	0051	2	×	EC-154
HO2S1 HTR (B2)	P0052	0052	2	×	EC-154
HO2S2 (B1)	P0138	0138	2	×	EC-244

Revision; 2004 April EC-17 2003 G35 Sedan

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					[TYPE 1]
	DT	C* ¹			
Items (CONSULT-II screen terms)	CONSULT-II GST* ²	ECM* ³	Trip	MIL lighting up	Reference page
HO2S2 (B1)	P0139	0139	2	×	EC-253
HO2S2 (B1)	P1146	1146	2	×	EC-483
HO2S2 (B1)	P1147	1147	2	×	EC-494
HO2S2 (B2)	P0158	0158	2	×	EC-244
HO2S2 (B2)	P0159	0159	2	×	EC-253
HO2S2 (B2)	P1166	1166	2	×	EC-483
HO2S2 (B2)	P1167	1167	2	×	EC-494
HO2S2 HTR (B1)	P0037	0037	2	×	EC-162
HO2S2 HTR (B1)	P0038	0038	2	×	EC-162
HO2S2 HTR (B2)	P0057	0057	2	×	EC-162
HO2S2 HTR (B2)	P0058	0058	2	×	EC-162
I/C SOLENOID/CIRC	P1752	1752	1	×	<u>AT-179</u>
I/C SOLENOID FNCTN	P1754	1754	1	×	<u>AT-184</u>
IAT SEN/CIRCUIT	P0112	0112	2	×	EC-185
IAT SEN/CIRCUIT	P0113	0113	2	×	EC-185
IAT SENSOR	P0127	0127	2	×	EC-207
INT/V TIM CONT-B1	P0011	0011	2	×	EC-145
INT/V TIM CONT-B2	P0021	0021	2	×	EC-145
ISC SYSTEM	P0506	0506	2	×	EC-425
ISC SYSTEM	P0507	0507	2	×	EC-427
KNOCK SEN/CIRC-B1	P0327	0327	2	_	EC-323
KNOCK SEN/CIRC-B1	P0328	0328	2	_	EC-323
L/PRESS SOL/CIRC	P0745	0745	2	×	<u>AT-132</u>
LC/B SOLENOID FNCT	P1774	1774	1	×	<u>AT-222</u>
LC/B SOLENOID/CIRC	P1772	1772	1	×	<u>AT-217</u>
MAF SEN/CIRCUIT	P0101	0101	1	×	EC-170
MAF SEN/CIRCUIT	P0102	0102	1	×	EC-178
MAF SEN/CIRCUIT	P0103	0103	1	×	EC-178
MAF SENSOR	P1102	1102	1	×	EC-445
MIL/CIRC	P0650	0650	2	_	EC-437
MULTI CYL MISFIRE	P0300	0300	2	×	EC-317
NATS MALFUNCTION	P1610 - P1615	1610 - 1615	2	_	<u>BL-125</u>
NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED.	No DTC	Flashing* ⁴	_	Flashing* ⁴	EC-72
NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED.	P0000	0000	_	_	_
P-N POS SW/CIRCUIT	P1706	1706	2	×	EC-578
PNP SW/CIRC	P0705	0705	2	×	<u>AT-110</u>
PURG VOLUME CONT/V	P0444	0444	2	×	EC-363
PURG VOLUME CONT/V	P0445	0445	2	×	EC-363
PURG VOLUME CONT/V	P1444	1444	2	×	EC-542
PW ST P SEN/CIRC	P0550	0550	2	_	EC-429

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Items	DTC* ¹			MII lighting	
(CONSULT-II screen terms)	CONSULT-II GST* ²	ECM* ³	Trip	MIL lighting up	Reference page
SENSOR POWER/CIRC	P1229	1229	1	×	EC-538
TCC SOLENOID/CIRC	P0740	0740	2	×	<u>AT-122</u>
TCS C/U FUNCTN	P1211	1211	2	_	EC-507
TCS/CIRC	P1212	1212	2	_	EC-508
THERMSTAT FNCTN	P0128	0128	2	×	EC-210
TP SEN 1/CIRC	P0222	0222	1	×	EC-297
TP SEN 1/CIRC	P0223	0223	1	×	EC-297
TP SEN 2/CIRC	P1223	1223	1	×	EC-521
TP SEN 2/CIRC	P1224	1224	1	×	EC-521
TP SEN/CIRC A/T	P1705	1705	1	×	<u>AT-152</u>
TP SEN/CIRCUIT	P0121	0121	1	×	EC-195
TP SEN/CIRCUIT	P0122	0122	1	×	EC-203
TP SEN/CIRCUIT	P0123	0123	1	×	EC-203
TP SENSOR	P0221	0221	1	×	EC-290
TURBINE REV S/CIRC	P1716	1716	2	×	<u>AT-161</u>
TW CATALYST SYS-B1	P0420	0420	2	×	EC-343
TW CATALYST SYS-B2	P0430	0430	2	×	EC-343
VEH SPD SEN/CIR AT*6	P0720	0720	2	×	<u>AT-115</u>
VEH SPEED SEN/CIRC*6	P0500	0500	2	×	EC-423
VENT CONTROL VALVE	P0447	0447	2	×	EC-369
VENT CONTROL VALVE	P1446	1446	2	×	EC-550

^{*1: 1}st trip DTC No. is the same as DTC No.

DTC No. Index

NOTE:

If DTC U1000 or U1001 is displayed with other DTC, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-142, "DTC U1000, U1001 CAN COMMUNICATION LINE".

×: Applicable —: Not applicable

DTC*1		Items		MIL lighting	
CONSULT-II GST* ²	ECM* ³	(CONSULT-II screen terms)	Trip	up	Reference page
No DTC	Flashing* ⁴	NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED.	_	Flashing* ⁴	<u>EC-72</u>
U1000	1000* ⁵	CAN COMM CIRCUIT	1	×	EC-142
U1001	1001* ⁵	CAN COMM CIRCUIT	2	_	EC-142
P0000	0000	NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED.	_	_	_

^{*2:} This number is prescribed by SAE J2012.

^{*3:} In Diagnostic Test Mode II (Self-diagnostic results), this number is controlled by NISSAN.

^{*4:} When engine is running.

^{*5:} The troubleshooting for this DTC needs CONSULT-II.

^{*6:} When the fail-safe operations for both self-diagnoses occur, the MIL illuminates.

^{*7:} This CONSULT-II screen term is displayed with CONSULT-II program card released after AED02D.

^{*8:} This DTC is applicable to vehicle with serial No. of 303268 and after.

					[TYPE 1]
DTC*1		Items		NAIL limbing	
CONSULT-II GST* ²	ECM*3	(CONSULT-II screen terms)	Trip	MIL lighting up	Reference page
P0011	0011	INT/V TIM CONT-B1	2	×	EC-145
P0021	0021	INT/V TIM CONT-B2	2	×	EC-145
P0031	0031	HO2S1 HTR (B1)	2	×	EC-154
P0032	0032	HO2S1 HTR (B1)	2	×	EC-154
P0037	0037	HO2S2 HTR (B1)	2	×	EC-162
P0038	0038	HO2S2 HTR (B1)	2	×	EC-162
P0051	0051	HO2S1 HTR (B2)	2	×	EC-154
P0052	0052	HO2S1 HTR (B2)	2	×	EC-154
P0057	0057	HO2S2 HTR (B2)	2	×	EC-162
P0058	0058	HO2S2 HTR (B2)	2	×	EC-162
P0101	0101	MAF SEN/CIRCUIT	1	×	EC-170
P0102	0102	MAF SEN/CIRCUIT	1	×	EC-178
P0103	0103	MAF SEN/CIRCUIT	1	×	EC-178
P0112	0112	IAT SEN/CIRCUIT	2	×	EC-185
P0113	0113	IAT SEN/CIRCUIT	2	×	EC-185
P0117	0117	ECT SEN/CIRCUIT	1	×	EC-190
P0118	0118	ECT SEN/CIRCUIT	1	×	EC-190
P0121	0121	TP SEN/CIRCUIT	1	×	EC-195
P0122	0122	TP SEN/CIRCUIT	1	×	EC-203
P0123	0123	TP SEN/CIRCUIT	1	×	EC-203
P0125	0125	ECT SENSOR	1	×	EC-204
P0127	0127	IAT SENSOR	2	×	EC-207
P0128	0128	THERMSTAT FNCTN	2	×	EC-210
P0132	0132	HO2S1 (B1)	2	×	EC-212
P0133	0133	HO2S1 (B1)	2	×	EC-221
P0134	0134	HO2S1 (B1)	2	×	EC-234
P0138	0138	HO2S2 (B1)	2	×	EC-244
P0139	0139	HO2S2 (B1)	2	×	EC-253
P0152	0152	HO2S1 (B2)	2	×	EC-212
P0153	0153	HO2S1 (B2)	2	×	EC-221
P0154	0154	HO2S1 (B2)	2	×	EC-234
P0158	0158	HO2S2 (B2)	2	×	EC-244
P0159	0159	HO2S2 (B2)	2	×	EC-253
P0171	0171	FUEL SYS-LEAN-B1	2	×	EC-264
P0172	0172	FUEL SYS-RICH-B1	2	×	EC-273
P0174	0174	FUEL SYS-LEAN-B2	2	×	EC-264
P0175	0175	FUEL SYS-RICH-B2	2	×	EC-273
P0181	0181	FTT SENSOR	2	×	EC-281
P0182	0182	FTT SEN/CIRCUIT	2	×	EC-286
P0183	0183	FTT SEN/CIRCUIT	2	×	EC-286
P0221	0221	TP SENSOR	1	×	EC-290
P0222	0222	TP SEN 1/CIRC	1	×	EC-297

INDEX FOR DTC

[TYPE 1]

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DT	-C*1					
CONSULT-II GST* ²	ECM* ³	ltems (CONSULT-II screen terms)	Trip	MIL lighting up	Reference page	A
P0223	0223	TP SEN 1/CIRC	1	×	EC-297	EC
P0226	0226	APP SENSOR	1	×	EC-304	LO
P0227	0227	APP SEN 1/CIRC	1	×	EC-311	
P0228	0228	APP SEN 1/CIRC	1	×	EC-311	С
P0300	0300	MULTI CYL MISFIRE	2	×	EC-317	
P0301	0301	CYL 1 MISFIRE	2	×	EC-317	D
P0302	0302	CYL 2 MISFIRE	2	×	EC-317	
P0303	0303	CYL 3 MISFIRE	2	×	EC-317	
P0304	0304	CYL 4 MISFIRE	2	×	EC-317	Е
P0305	0305	CYL 5 MISFIRE	2	×	EC-317	
P0306	0306	CYL 6 MISFIRE	2	×	EC-317	F
P0327	0327	KNOCK SEN/CIRC-B1	2	_	EC-323	Г
P0328	0328	KNOCK SEN/CIRC-B1	2	_	EC-323	
P0335	0335	CKP SEN/CIRCUIT	2	×	EC-327	G
P0340	0340	CMP SEN/CIRC-B1	2	×	EC-334	
P0345	0345	CMP SEN/CIRC-B2	2	×	EC-334	
P0420	0420	TW CATALYST SYS-B1	2	×	EC-343	Н
P0430	0430	TW CATALYST SYS-B2	2	×	EC-343	
P0441	0441	EVAP PURG FLOW/MON	2	×	EC-348	1
P0442	0442	EVAP SMALL LEAK	2	×	EC-353	
P0444	0444	PURG VOLUME CONT/V	2	×	EC-363	
P0445	0445	PURG VOLUME CONT/V	2	×	EC-363	J
P0447	0447	VENT CONTROL VALVE	2	×	EC-369	
P0451* ⁸	0451* ⁸	EVAP SYS PRES SEN*7	2	×	EC-376	K
P0452	0452	EVAP SYS PRES SEN	2	×	EC-379	
P0453	0453	EVAP SYS PRES SEN	2	×	EC-385	
P0455	0455	EVAP GROSS LEAK	2	×	EC-393	L
P0456	0456	EVAP VERY SML LEAK	2	×	EC-401	
P0460	0460	FUEL LEV SEN SLOSH	2	×	EC-411	M
P0461	0461	FUEL LEVEL SENSOR	2	×	EC-416	
P0462	0462	FUEL LEVL SEN/CIRC	2	×	EC-418	
P0463	0463	FUEL LEVL SEN/CIRC	2	×	EC-418	
P0500	0500	VEH SPEED SEN/CIRC*6	2	×	EC-423	
P0506	0506	ISC SYSTEM	2	×	EC-425	
P0507	0507	ISC SYSTEM	2	×	EC-427	
P0550	0550	PW ST P SEN/CIRC	2	_	EC-429	
P0605	0605	ECM	1 or 2	× or —	EC-434	
P0650	0650	MIL/CIRC	2	_	EC-437	
P0705	0705	PNP SW/CIRC	2	×	<u>AT-110</u>	
P0710	0710	ATF TEMP SEN/CIRC	2	×	AT-155	
P0720	0720	VEH SPD SEN/CIR AT*6	2	×	<u>AT-115</u>	
P0725	0725	ENGINE SPEED SIG	2	×	AT-120	
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Revision; 2004 April EC-21 2003 G35 Sedan

					[TYPE 1]
DTC*1				NAUL PLATE	
CONSULT-II GST* ²	ECM* ³	Items (CONSULT-II screen terms)	Trip	MIL lighting up	Reference page
P0740	0740	TCC SOLENOID/CIRC	2	×	<u>AT-122</u>
P0744	0744	A/T TCC S/V FNCTN	2	×	<u>AT-127</u>
P0745	0745	L/PRESS SOL/CIRC	2	×	<u>AT-132</u>
P1065	1065	ECM BACK UP/CIRCUIT	2	×	EC-441
P1102	1102	MAF SENSOR	1	×	EC-445
P1121	1121	ETC ACTR	1	×	EC-451
P1122	1122	ETC FUNCTION/CIRC	1	×	EC-453
P1124	1124	ETC MOT PWR	1	×	EC-460
P1126	1126	ETC MOT PWR	1	×	EC-460
P1128	1128	ETC MOT	1	×	EC-465
P1143	1143	HO2S1 (B1)	2	×	EC-470
P1144	1144	HO2S1 (B1)	2	×	EC-476
P1146	1146	HO2S2 (B1)	2	×	EC-483
P1147	1147	HO2S2 (B1)	2	×	EC-494
P1148	1148	CLOSED LOOP-B1	1	×	EC-505
P1163	1163	HO2S1 (B2)	2	×	EC-470
P1164	1164	HO2S1 (B2)	2	×	EC-476
P1166	1166	HO2S2 (B2)	2	×	EC-483
P1167	1167	HO2S2 (B2)	2	×	EC-494
P1168	1168	CLOSED LOOP-B2	1	×	EC-505
P1211	1211	TCS C/U FUNCTN	2	_	EC-507
P1212	1212	TCS/CIRC	2	_	EC-508
P1217	1217	ENG OVER TEMP	1	×	EC-509
P1223	1223	TP SEN 2/CIRC	1	×	EC-521
P1224	1224	TP SEN 2/CIRC	1	×	EC-521
P1225	1225	CTP LEARNING	2	_	EC-528
P1226	1226	CTP LEARNING	2	_	EC-530
P1227	1227	APP SEN 2/CIRC	1	×	EC-532
P1228	1228	APP SEN 2/CIRC	1	×	EC-532
P1229	1229	SENSOR POWER/CIRC	1	×	EC-538
P1444	1444	PURG VOLUME CONT/V	2	×	EC-542
P1446	1446	VENT CONTROL VALVE	2	×	EC-550
P1464	1464	FUEL LEVL SEN/CIRC	2	×	EC-557
P1564	1564	ASCD SW	2	_	EC-560
P1572	1572	ASCD BRAKE SW	2	_	EC-567
P1574	1574	ASCD VHL SPD SEN	2	_	EC-576
P1610 - P1615	1610 - 1615	NATS MALFUNCTION	2	_	<u>BL-125</u>
P1705	1705	TP SEN/CIRC A/T	1	×	<u>AT-152</u>
P1706	1706	P-N POS SW/CIRCUIT	2	×	EC-578
P1716	1716	TURBINE REV S/CIRC	2	×	<u>AT-161</u>
P1730	1730	A/T INTERLOCK	1	×	<u>AT-168</u>
P1752	1752	I/C SOLENOID/CIRC	1	×	<u>AT-179</u>

INDEX FOR DTC

[TYPE 1]

DTC* ¹					
CONSULT-II GST* ²	ECM* ³	ltems (CONSULT-II screen terms)	Trip	MIL lighting up	Reference page
P1754	1754	I/C SOLENOID FNCTN	1	×	<u>AT-184</u>
P1757	1757	FR/B SOLENOID/CIRC	1	×	<u>AT-188</u>
P1759	1759	FR/B SOLENOID FNCT	1	×	AT-193
P1762	1762	D/C SOLENOID/CIRC	1	×	<u>AT-198</u>
P1764	1764	D/C SOLENOID FNCTN	1	×	AT-203
P1767	1767	HLR/C SOL/CIRC	1	×	AT-207
P1769	1769	HLR/C SOL FNCTN	1	×	AT-212
P1772	1772	LC/B SOLENOID/CIRC	1	×	AT-217
P1774	1774	LC/B SOLENOID FNCT	1	×	AT-222
P1805	1805	BRAKE SW/CIRCUIT	2	_	EC-584

^{*1: 1}st trip DTC No. is the same as DTC No.

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^{*2:} This number is prescribed by SAE J2012.

^{*3:} In Diagnostic Test Mode II (Self-diagnostic results), this number is controlled by NISSAN.

^{*4:} When engine is running.

^{*5:} The troubleshooting for this DTC needs CONSULT-II.

^{*6:} When the fail-safe operations for both self-diagnoses occur, the MIL illuminates.

^{*7:} This CONSULT-II screen term is displayed with CONSULT-II program card released after AED02D.

^{*8:} This DTC is applicable to vehicle with serial No. of 303268 and after.

[TYPE 1]

PRECAUTIONS PFP:00001

Precautions for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

ARSONRG1

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 and SB section of this Service Man-

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 section.
- 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.

On Board Diagnostic (OBD) System of Engine and A/T

ABS00036

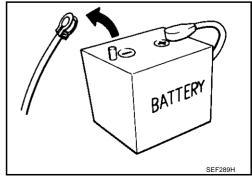
The ECM has an on board diagnostic system. It will light up the malfunction indicator lamp (MIL) to warn the driver of a malfunction causing emission deterioration.

CAUTION:

- Be sure to 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 light up.
- Be sure to connect and lock the connectors securely after work. A loose (unlocked) connector will
 cause the MIL to light up 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 slidelocking type harness connector. For description and how to disconnect, refer to <u>PG-66</u>, "HAR-NESS CONNECTOR".
- Be sure to route and secure the harnesses properly after work. The interference of the harness with a bracket, etc. may cause the MIL to light up due to the short circuit.
- Be sure to connect rubber tubes properly after work. A misconnected or disconnected rubber tube
 may cause the MIL to light up due to the malfunction of the EVAP system or fuel injection system,
 etc.
- Be sure to erase the unnecessary malfunction information (repairs completed) from the ECM and TCM (Transmission control module) before returning the vehicle to the customer.

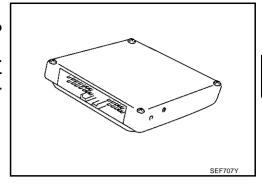
Precaution ABS00037

- Always use a 12 volt battery as power source.
- Do not attempt to disconnect battery cables while engine is running.
- Before connecting or disconnecting the ECM harness connector, turn ignition switch OFF and disconnect battery ground 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.

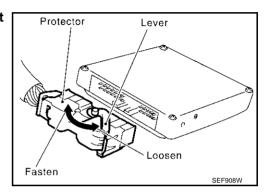


- Do not disassemble ECM.
- If a battery cable is disconnected, the memory will return to the ECM value.

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. Do not replace parts because of a slight variation.



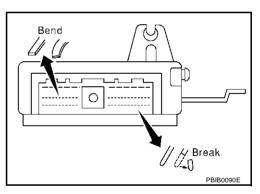
• When connecting ECM harness connector, fasten it securely with a lever as far as it will go as shown at right.

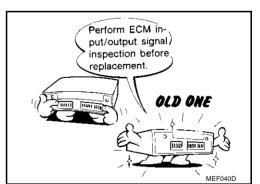


 When connecting or disconnecting pin connectors into or from ECM, take care not to damage pin terminals (bend or break).

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 <u>EC-103</u>.
- Handle mass air flow sensor carefully to avoid damage.
- Do not disassemble mass air flow sensor.
- Do not clean mass air flow sensor with any type of detergent.
- Do not disassemble electric throttle control actuator.
- Even a slight leak in the air intake system can cause serious incidents.
- Do not shock or jar the camshaft position sensor (PHASE), crankshaft position sensor (POS).





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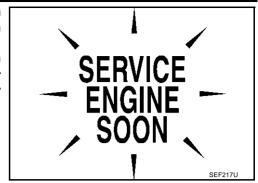
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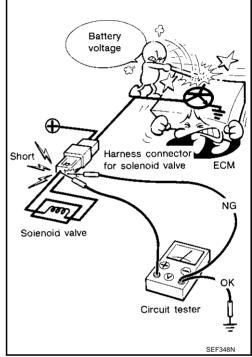
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 After performing each TROUBLE DIAGNOSIS, perform "DTC Confirmation Procedure" or "Overall Function Check".

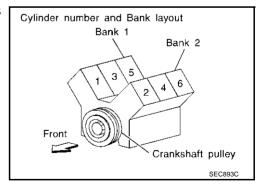
The DTC should not be displayed in the "DTC Confirmation Procedure" if the repair is completed. The "Overall Function Check" should be a good result if the repair is completed.



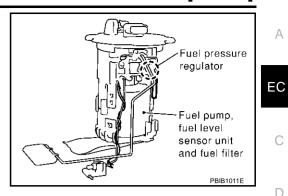
- When measuring ECM signals with a circuit tester, never allow the two tester probes to contact.
 Accidental contact of probes will cause a short circuit and damage the ECM power transistor.
- Do not use ECM ground terminals when measuring input/ output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.



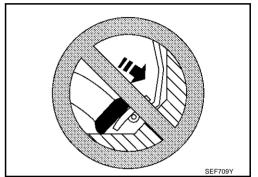
• "B1" indicates the bank 1, "B2" indicates the bank 2 as shown in the figure.



- Do not operate fuel pump when there is no fuel in lines.
- Tighten fuel hose clamps to the specified torque.



- Do not depress accelerator pedal when starting.
- Immediately after starting, do not rev up engine unnecessarily.
- Do not rev up engine just prior to shutdown.



- 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. Do not let them run parallel for a long distance.
- Adjust the antenna and feeder line so that the standingwave radio can be kept smaller.
- Be sure to ground the radio to vehicle body.

Wiring Diagrams and Trouble Diagnosis

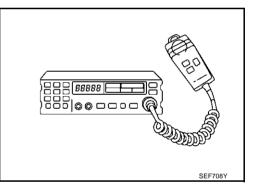
When you read wiring diagrams, refer to the following:

- GI-14, "How to Read Wiring Diagrams"
- PG-3, "POWER SUPPLY ROUTING CIRCUIT" for power distribution circuit

When you perform trouble diagnosis, refer to the following:

- GI-10, "HOW TO FOLLOW TEST GROUPS IN TROUBLE DIAGNOSES"
- GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident"





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PREPARATION PFP:00002

Special Service Tools

ABS00039

Tool number (Kent-Moore No.) Tool name		Description
KV10117100 (J36471-A) Heated oxygen sensor wrench	S-NT379	Loosening or tightening heated oxygen sensors with 22 mm (0.87 in) hexagon nut
KV10114400 (J-38365) Heated oxygen sensor wrench	S-NT636	Loosening or tightening heated oxygen sensors a: 22 mm (0.87 in)
(J-44321) Fuel pressure gauge kit	LEC642	Checking fuel pressure
EG17650301 (J-33984-A) Radiator cap tester adapter	c ↓	Adapting radiator cap tester to radiator cap and radiator filler neck a: 28 (1.10) dia. b: 31.4 (1.236) dia. c: 41.3 (1.626) dia. Unit: mm (in)

PREPARATION

[TYPE 1]

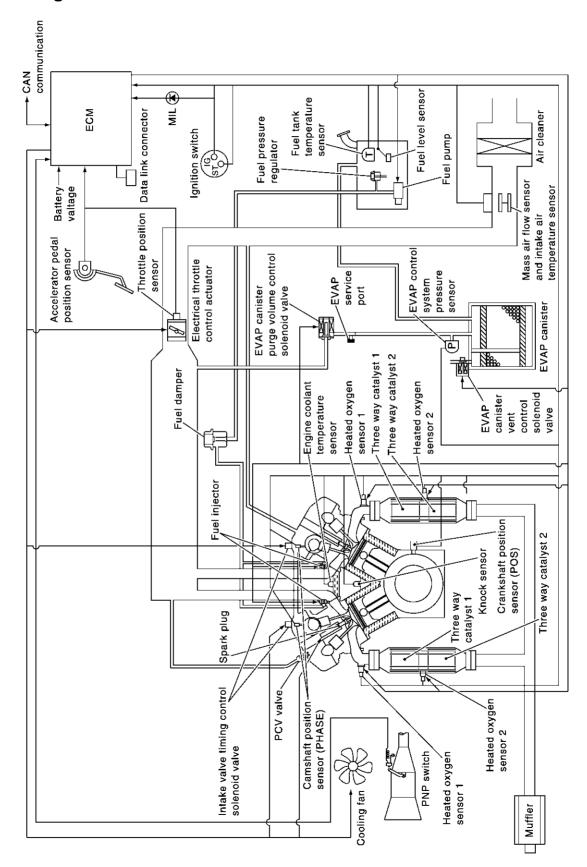
ommercial Servic	ce Tools	ABS0003A
Tool name (Kent-Moore No.)		Description
Quick connector release		Removing fuel tube quick connectors in engine room (Available in SEC. 164 of PARTS CATALOG: Part No. 16441 6N210)
Leak detector i.e.: (J41416)	PBIC0198E	Locating the EVAP leak
EVAP service port adapter .e.: (J41413-OBD)	S-NT703	Applying positive pressure through EVAP service port
Fuel filler cap adapter .e.: (MLR-8382)	S-NT704	Checking fuel tank vacuum relief valve opening pressure
Socket wrench	S-NT815 19 mm (0.75 in) More than Nore than 12 mm (1.26 in) S-NT705	Removing and installing engine coolant temperature sensor
Oxygen sensor thread cleaner .e.: (J-43897-18) (J-43897-12)	Mating surface shave cylinder	Reconditioning the exhaust system threads before installing a new oxygen sensor. Use with anti-seize 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 specification MIL-A- 907)	S-NT779	Lubricating oxygen sensor thread cleaning tool when reconditioning exhaust system threads.

ENGINE CONTROL SYSTEM

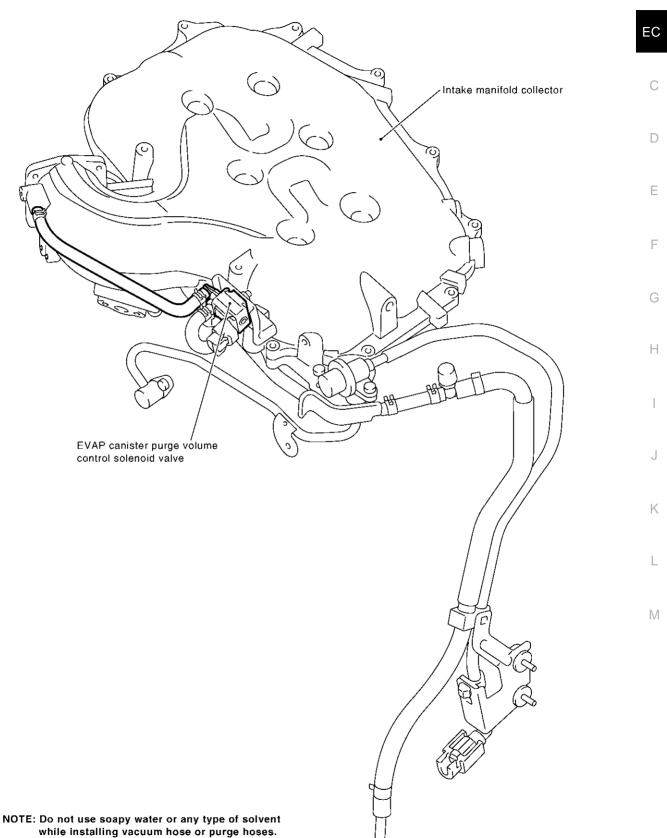
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ABS0003B

System Diagram



Vacuum Hose Drawing



Refer to EC-30, "System Diagram" for Vacuum Control System.

EC-31 2003 G35 Sedan Revision; 2004 April

PBIB1552E

ENGINE CONTROL SYSTEM

[TYPE 1]

System Chart ABS0003D

Input (Sensor)	ECM Function	Output (Actuator)	
Camshaft position sensor (PHASE)	Fuel injection & mixture ratio control	Fuel injectors	
 Crankshaft position sensor (POS) 	Electronic ignition system	Power transistor	
Mass air flow sensor	Fuel pump control	Fuel pump relay*4	
Engine coolant temperature sensor	ASCD vehicle speed control	Electric throttle control actuator	
Heated oxygen sensor 1	On board diagnostic system	MIL (On the instrument panel)	
Throttle position sensor	Heated oxygen sensor 1 heater control	Heated oxygen sensor 1 heater	
Accelerator pedal position sensorPark/neutral position (PNP) switch	Heated oxygen sensor 2 heater control	Heated oxygen sensor 2 heater	
 Intake air temperature sensor Power steering pressure sensor 	EVAP canister purge flow control	EVAP canister purge volume control solenoid valve	
• Ignition switch	Air conditioning cut control	Air conditioner relay*4	
Battery voltage	Cooling fan control	Cooling fan relays*4	
 Knock sensor 		0 ,	
 Refrigerant pressure sensor 			
Stop lamp switch			
 ASCD steering switch 			
 ASCD brake switch 			
 Fuel level sensor*¹ 		EVAP canister vent control valve	
 EVAP control system pressure sensor 	ON BOARD DIAGNOSIS for EVAP system		
 Fuel tank temperature sensor*¹ 			
 Heated oxygen sensor 2 *2 			
 TCM (Transmission control module) *3 			
 Air conditioner switch*³ 			
 Wheel sensor*³ 			
 Electrical load signal*³ 			

^{*1:} This sensor is not used to control the engine system. This is used only for the on board diagnosis.

^{*2:} This sensor is not used to control the engine system under normal conditions.

^{*3:} This signal is sent to the ECM through CAN communication line.

^{*4:} This relay is built into IPDM E/R.

ENGINE CONTROL SYSTEM

[TYPE 1]

Multiport Fuel Injection (MFI) System INPUT/OUTPUT SIGNAL CHART

ABS0003E

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Sensor	Input Signal to ECM	ECM function	Actuator
Crankshaft position sensor (POS)	Engine speed		
Camshaft position sensor (PHASE)	Piston position		Fuel injectors
Mass air flow sensor	Amount of intake air		
Engine coolant temperature sensor	Engine coolant temperature		
Heated oxygen sensor 1	Density of oxygen in exhaust gas		
Throttle position sensor	Throttle position		
Accelerator pedal position sensor	Accelerator pedal position		
Park/neutral position (PNP) switch	Gear position	Fuel injection& mixture ratio	
Ignition switch	Start signal	control	
Knock sensor	Engine knocking condition		
Battery	Battery voltage		
Power steering pressure sensor	Power steering operation		
Heated oxygen sensor 2 *1	Density of oxygen in exhaust gas		
Air conditioner switch*2	Air conditioner operation		
Wheel sensor*2	Vehicle speed		

^{*1:} Under normal conditions, this sensor is not for engine control operation.

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 both the crankshaft 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

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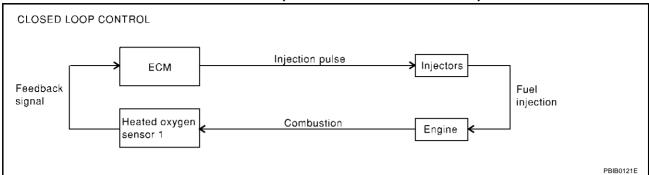
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^{*2:} This signal is sent to the ECM through CAN communication line.

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 then better reduce CO, HC and NOx emissions. This system uses heated oxygen sensor 1 in the exhaust manifold to monitor if the engine operation is rich or lean. The ECM adjusts the injection pulse width according to the sensor voltage signal. For more information about heated oxygen sensor 1, refer to EC-212. 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 heated oxygen 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 heated oxygen sensor 1 or its circuit
- Insufficient activation of heated oxygen 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 heated oxygen 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 film) and characteristic changes during operation (i.e., injector clogging) directly affect mixture ratio.

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 heated oxygen 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 long-term to compensate for continual deviation of the short term fuel trim from the central value. Such deviation will occur due to individual engine differences, wear over time and changes in the usage environment.

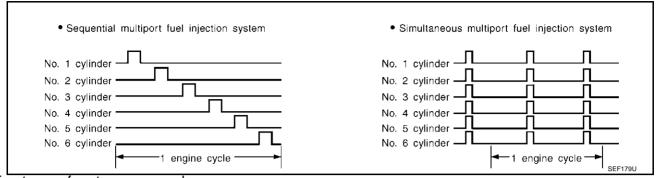
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FUEL INJECTION TIMING



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 two 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 or operation of the engine at excessively high speeds.

Electronic Ignition (EI) System INPUT/OUTPUT SIGNAL CHART

ABS0003F

Sensor	Input Signal to ECM	ECM function	Actuator
Crankshaft position sensor (POS)	Engine speed Piston position		Power transistor
Camshaft position sensor (PHASE)			
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	Ignition timing control	
Ignition switch	Start signal	Goriaro.	
Knock sensor	Engine knocking		
Park/neutral position (PNP) switch	Gear position		
Battery	Battery voltage		
Wheel sensor*	Vehicle speed		

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

SYSTEM DESCRIPTION

The ignition timing is controlled by the ECM to maintain the best airfuel ratio for every running condition of the engine. The ignition timing data is stored in the ECM. This data forms the map shown.

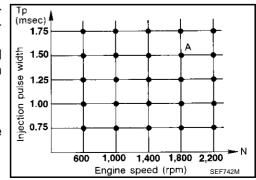
The ECM receives information such as the injection pulse width and camshaft position sensor signal. Computing this information, ignition signals are transmitted to the power transistor.

e.g., N: 1,800 rpm, Tp: 1.50 msec

A °BTDC

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



Revision; 2004 April EC-35 2003 G35 Sedan

- 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 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.

Air Conditioning Cut Control INPUT/OUTPUT SIGNAL CHART

ABS00030

Sensor	Input Signal to ECM	ECM function	Actuator
Air conditioner switch*	Air conditioner "ON" signal		Air conditioner relay
Throttle position sensor	Throttle position		
Accelerator pedal position sensor	Accelerator pedal position		
Crankshaft position sensor (POS) Camshaft position sensor (PHASE)	Engine speed	Air conditioner	
Engine coolant temperature sensor	Engine coolant temperature	cut control	
Ignition switch	Start signal		
Refrigerant pressure sensor	Refrigerant pressure		
Power steering pressure sensor	Power steering operation		
Wheel sensor*	Vehicle speed		

^{*:} This signal is sent to the ECM through 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.

Fuel Cut Control (at No Load and High Engine Speed) INPUT/OUTPUT SIGNAL CHART

ABS0003H

Sensor	Input Signal to ECM	ECM function	Actuator
Park/neutral position (PNP) switch	Neutral position	- Fuel cut con-	
Throttle position sensor	Throttle position		Fuel injectors
Accelerator pedal position sensor	Accelerator pedal position		
Engine coolant temperature sensor	Engine coolant temperature		
Crankshaft position sensor (POS) Camshaft position sensor (PHASE)	Engine speed		
Wheel sensor*	Vehicle speed		

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

SYSTEM DESCRIPTION

If the engine speed is above 1,800 rpm with no load (for example, in neutral and engine speed 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 operate until the engine speed reaches 1,500 rpm, then fuel cut is cancelled.

NOTE

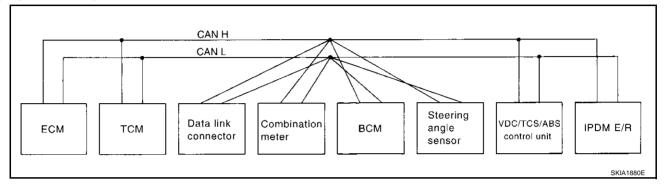
This function is different from deceleration control listed under "Multiport Fuel Injection (MFI) System", EC-33.

CAN Communication SYSTEM DESCRIPTION

500031

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.

SYSTEM DIAGRAM



INPUT/OUTPUT SIGNAL CHART

T: Transmit R: Receive

						T: Transmit	t R: Receive
Signals	ECM	TCM	Combina- tion meter	ВСМ	Steering angle sensor	VDC/TCS/ ABS con- trol unit	IPDM E/R
Engine torque signal	T	R					
Engine speed signal	T	R	R			R	
Engine coolant temperature signal	Т	R	R				
Accelerator pedal position signal	T	R				R	
Closed throttle position signal	T	R					
Wide open throttle position signal	T	R					
Battery voltage signal	T	R					
Stop lamp switch signal		R	Т				
Fuel consumption monitor signal	T		R				
A/T self-diagnosis signal	R	Т					
A/T CHECK indicator lamp signal		Т	R				
A/T position indicator signal		Т	R			R	
ABS operation signal		R				Т	
A/T shift schedule change demand signal		R				Т	
A/C switch signal	R			T			
A/C compressor request signal	T						R
A/C compressor feedback signal	T		R				
Blower fan motor switch signal	R			T			
Cooling fan motor operation signal	T						R
Position lights request signal			R	Т			R
Low beam request signal				Т			R
Low beam status signal	R						Т
High beam request signal			R	Т			R
High beam status signal	R						Т

Revision; 2004 April EC-37 2003 G35 Sedan

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ENGINE CONTROL SYSTEM

[TYPE 1]

							[– .]
Signals	ECM	ТСМ	Combina- tion meter	всм	Steering angle sensor	VDC/TCS/ ABS con- trol unit	IPDM E/R
Front fog lights request signal				Т			R
			R			Т	
Vehicle speed signal	R	R	Т	R			
Sleep request 1 signal			R	Т			
Sleep request 2 signal				Т			R
Wake up request 1 signal			R	Т			R
Wake up request 2 signal			R	Т			R
Door switch signal (without navigation system)			R	Т			R
Door switch signal (with navigation system)			Т	R			
Turn indicator signal			R	Т			
Seat belt buckle switch signal			Т	R			
Oil pressure switch signal			R				Т
Buzzer output signal			R	Т			
ASCD SET lamp signal	T		R				
ASCD CRUISE lamp signal	Т		R				
ASCD OD cancel request signal	Т	R					
ASCD operation signal	Т	R					
Output shaft revolution signal	R	Т					
Front wiper request signal				Т			R
Front wiper stop position signal				R			Т
Rear window defogger switch signal				Т			R
Rear window defogger control sig- nal	R						Т
Manual mode signal		R	Т				
Not manual mode signal		R	Т				
Manual mode shift up signal		R	Т				
Manual mode shift down signal		R	Т				
Manual mode indicator signal		Т	R				
Hood switch signal				R			Т
Theft warning horn request signal				Т			R
Horn chirp signal				Т			R
Steering angle sensor signal					Т	R	

BASIC SERVICE PROCEDURE

[TYPE 1]

BASIC SERVICE PROCEDURE

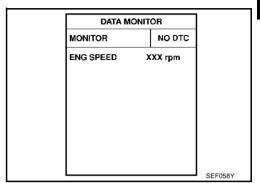
PFP:00018

Idle Speed and Ignition Timing Check IDLE SPEED

ARSONNE

(P) With CONSULT-II

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



® With GST

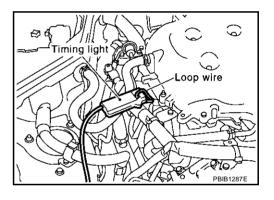
Check idle speed with GST.

IGNITION TIMING

Any of following two methods may be used.

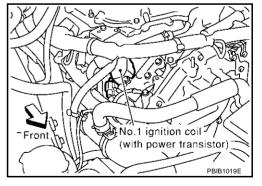
Method A

- 1. Attach timing light to loop wire as shown.
- Check ignition timing.

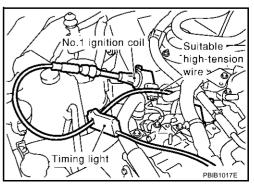


Method B

1. Remove No. 1 ignition coil.



Connect No. 1 ignition coil and No. 1 spark plug with suitable high-tension wire as shown, and attach timing light clamp to this wire.



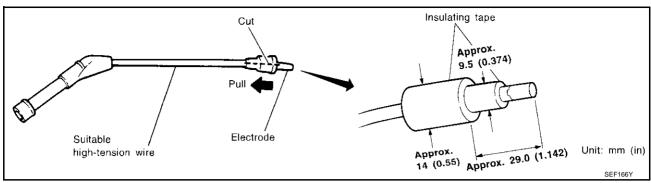
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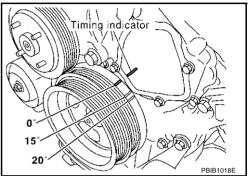
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3. Check ignition timing.



Idle Speed/Ignition Timing/Idle Mixture Ratio Adjustment PREPARATION

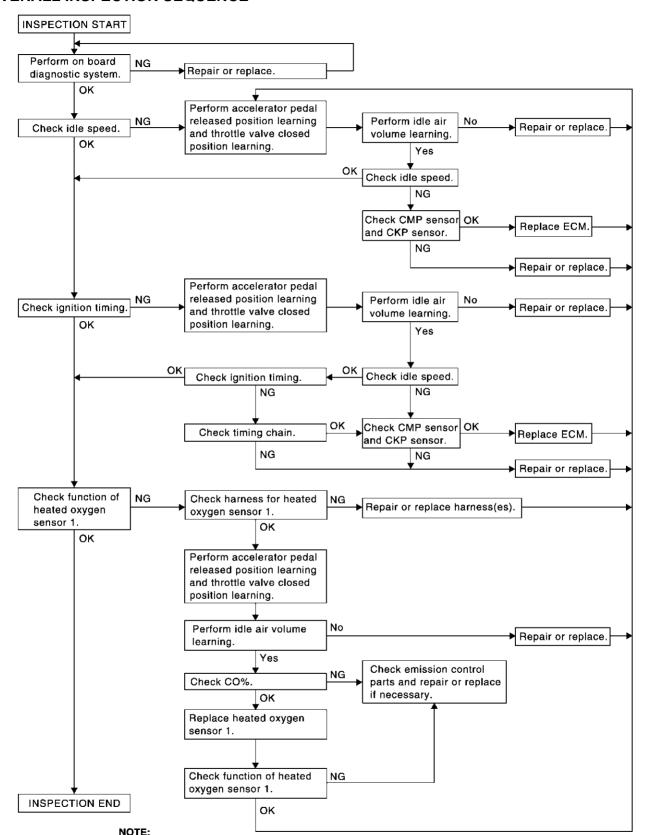
ABS0003K

- 1. Make sure that the following parts are in good order.
 - Battery
 - Ignition system
 - Engine oil and coolant levels
 - Fuses
 - ECM harness connector
 - Vacuum hoses
 - Air intake system (Oil filler cap, oil level gauge, etc.)
 - Fuel pressure
 - Engine compression
 - Throttle valve
 - Evaporative emission system
- 2. On air conditioner equipped models, checks should be carried out while the air conditioner is "OFF".
- 3. On automatic transmission equipped models, when checking idle rpm, ignition timing and mixture ratio, checks should be carried out while shift lever is in "N" position.
- 4. When measuring "CO" percentage, insert probe more than 40 cm (15.7 in) into tail pipe.
- 5. Turn off headlamp, heater blower, rear window defogger.
- 6. Keep front wheels pointed straight ahead.

Α

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OVERALL INSPECTION SEQUENCE



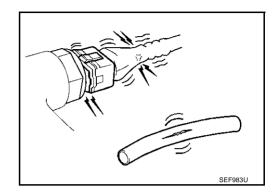
If a vehicle contains a part which is operating outside of design specifications with no MIL illumination, the part shall not be replaced prior to emission testing unless it is determined that the part has been tampered with or abused in such a way that the diagnostic system cannot reasonably be expected to detect the resulting malfunction.

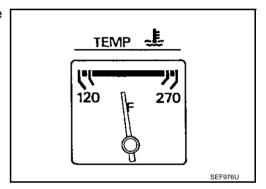
PBIB1054E

INSPECTION PROCEDURE

1. INSPECTION START

- 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 leaks
- Air cleaner clogging
- Gasket
- 3. Confirm 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.
- 4. Start engine and warm it up until engine coolant temperature indicator points the middle of gauge. Ensure engine stays below 1,000 rpm.

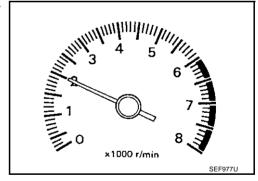




- Run engine at about 2,000 rpm for about 2 minutes under noload.
- 6. Make sure that no DTC is displayed with CONSULT-II or GST.

OK or NG

OK >> GO TO 3. NG >> GO TO 2.



2. REPAIR OR REPLACE

Repair or replace components as necessary according to corresponding "Diagnostic Procedure".

>> GO TO 3.

EC

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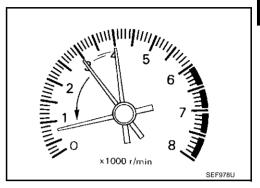
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$\overline{3}$. Check target idle speed

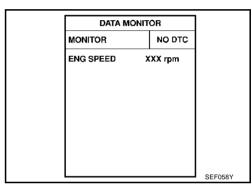
(II) With CONSULT-II

- 1. Run engine at about 2,000 rpm for about 2 minutes under no-load.
- 2. Rev engine (2,000 to 3,000 rpm) two or three times under no-load, then run engine at idle speed for about 1 minute.



3. Read idle speed in "DATA MONITOR" mode with CONSULT-II.

650 \pm 50 rpm (in "P" or "N" position)



W Without CONSULT-II

- 1. Run engine at about 2,000 rpm for about 2 minutes under no-load.
- 2. Rev engine (2,000 to 3,000 rpm) two or three times under no-load, then run engine at idle speed for about 1 minute.
- 3. Check idle speed.

650 \pm 50 rpm (in "P" or "N" position)

OK or NG

OK >> GO TO 10. NG >> GO TO 4.

4. PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING

- 1. Stop engine.
- 2. Perform EC-51, "Accelerator Pedal Released Position Learning".

>> GO TO 5.

5. PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Perform EC-51, "Throttle Valve Closed Position Learning".

>> GO TO 6.

6. PERFORM IDLE AIR VOLUME LEARNING

Perform EC-51, "Idle Air Volume Learning".

Is Idle Air Volume Learning carried out successfully?

YES or NO

YES >> GO TO 7.

NO >> 1. Follow the instruction of "Idle Air Volume Learning".

2. GO TO 4.

7. CHECK TARGET IDLE SPEED AGAIN

(P) With CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- 2. Read idle speed in "DATA MONITOR" mode with CONSULT-II.

W Without CONSULT-II

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

```
650 \pm 50 rpm (in "P" or "N" position)
```

OK or NG

OK >> GO TO 10. NG >> GO TO 8.

8. DETECT MALFUNCTIONING PART

Check the following.

- Check camshaft position sensor (PHASE) and circuit. Refer to <u>EC-334</u>.
- Check crankshaft position sensor (POS) and circuit. Refer to <u>EC-327</u>.

OK or NG

OK >> GO TO 9.

NG >> 1. Repair or replace.

2. GO TO 4.

9. CHECK ECM FUNCTION

- Substitute another known-good ECM to check ECM function. (ECM may be the cause of a incident, but this is the rarely the case.)
- 2. Perform initialization of IVNS (NATS) system and registration of IVNS (NATS) ignition key IDs. Refer to.<u>BL-127</u>, "<u>ECM Re-communicating Function</u>"

>> GO TO 4.

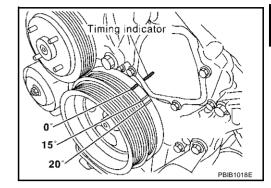
10. CHECK IGNITION TIMING

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

15 \pm 5° BTDC (in "P" or "N" position)

OK or NG

OK (With CONSULT-II)>>GO TO 19. OK (Without CONSULT-II)>>GO TO 20. NG >> GO TO 11.



11. PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING

- 1. Stop engine.
- 2. Perform EC-51, "Accelerator Pedal Released Position Learning".

>> GO TO 12.

12. PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Perform EC-51, "Throttle Valve Closed Position Learning".

>> GO TO 13.

13. PERFORM IDLE AIR VOLUME LEARNING

Perform EC-51, "Idle Air Volume Learning".

Is Idle Air Volume Learning carried out successfully?

YES or NO

YES >> GO TO 14.

NO >> 1. Follow the instruction of "Idle Air Volume Learning".

2. GO TO 4.

14. CHECK TARGET IDLE SPEED AGAIN

(P) With CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- Read idle speed in "DATA MONITOR" mode with CONSULT-II.

650 ± 50 rpm (in "P" or "N" position)

(R) Without CONSULT-II

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

650 \pm 50 rpm (in "P" or "N" position)

OK or NG

OK >> GO TO 15. NG >> GO TO 17.

EC-45 2003 G35 Sedan Revision; 2004 April

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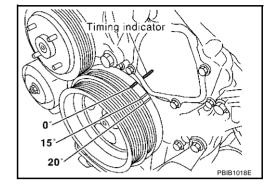
15. CHECK IGNITION TIMING AGAIN

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

15
$$\pm$$
 5° BTDC (in "P" or "N" position)

OK or NG

OK (With CONSULT-II)>>GO TO 19. OK (Without CONSULT-II)>>GO TO 20. NG >> GO TO 16.



16. CHECK TIMING CHAIN INSTALLATION

Check timing chain installation. Refer to EM-54, "TIMING CHAIN".

OK or NG

OK >> GO TO 17.

NG >> 1. Repair the timing chain installation.

2. GO TO 4.

17. DETECT MALFUNCTIONING PART

Check the following.

- Check camshaft position sensor (PHASE) and circuit. Refer to EC-334.
- Check crankshaft position sensor (POS) and circuit. Refer to EC-327.

OK or NG

OK >> GO TO 18.

NG >> 1. Repair or replace.

2. GO TO 4.

18. CHECK ECM FUNCTION

- 1. Substitute another known-good ECM to check ECM function. (ECM may be the cause of a incident, but this is the rarely the case.)
- 2. Perform initialization of IVNS (NATS) system and registration of IVNS (NATS) ignition key IDs. Refer to <u>BL-127, "ECM Re-communicating Function"</u>.

>> GO TO 4.

BASIC SERVICE PROCEDURE

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19. CHECK HEATED OXYGEN SENSOR 1 (BANK 1) SIGNAL

(P) With CONSULT-II

- Run engine at about 2,000 rpm for about 2 minutes under no-load.
- See "HO2S1 MNTR (B1)" in "DATA MONITOR" mode.
- Running engine at 2,000 rpm under no-load (The engine is warmed up to normal operating temperature.), check that the monitor fluctuates between LEAN and RICH more than 5 times during 10 seconds.

1 time: **RICH** → **LEAN** → **RICH**

 $RICH \rightarrow LEAN \rightarrow RICH \rightarrow LEAN \rightarrow RICH$ 2 times:

OK or NG

>> GO TO 21. OK

NG (Monitor does not fluctuate.)>>GO TO 23.

NG (Monitor fluctuates less than 5 times.)>>GO TO 31.

20. CHECK HEATED OXYGEN SENSOR 1 (BANK 1) SIGNAL

(R) Without CONSULT-II

- Stop engine and set ECM to Self-diagnostic mode II (Heated oxygen sensor 1 monitor). Refer to EC-72, "HOW TO SWITCH DIAGNOSTIC TEST MODE" .
- Start engine and run it at about 2,000 rpm for about 2 minutes under no-load.
- Running engine at 2,000 rpm under no-load (The engine is warmed up to normal operating temperature.), check that the MIL comes on more than 5 times during 10 seconds.

OK or NG

OK >> GO TO 22.

NG (MIL does not come on)>>GO TO 23.

NG (MIL comes on less than 5 times)>>GO TO 31.

21. CHECK HEATED OXYGEN SENSOR 1 (BANK 2) SIGNAL

(P) With CONSULT-II

See "HO2S1 MNTR (B2)" in "DATA MONITOR" mode.

Running engine at 2,000 rpm under no-load (The engine is warmed up to normal operating temperature.), check that the monitor fluctuates between LEAN and RICH more than 5 times during 10 seconds.

> **RICH** → **LEAN** → **RICH** 1 time:

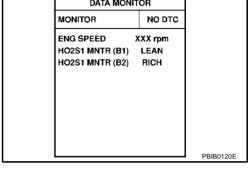
2 times: $RICH \rightarrow LEAN \rightarrow RICH \rightarrow LEAN \rightarrow RICH$

OK or NG

OK >> INSPECTION END

NG (Monitor does not fluctuate.)>>GO TO 24.

NG (Monitor fluctuates less than 5 times.)>>GO TO 31.



DATA MONITOR

DATA MONITOR MONITOR ENG SPEED XXX rpm HO2S1 MNTR (B1) LEAN HO2S1 MNTR (B2) RICH PBIB0120

EC-47 Revision; 2004 April 2003 G35 Sedan

22. CHECK HEATED OXYGEN SENSOR 1 (BANK 2) SIGNAL

⋈ Without CONSULT-II

- 1. Switch the monitored sensor from bank 1 to bank 2. Refer to EC-73, "How to Switch Monitored Sensor From Bank 1 to Bank 2 or Vice Versa".
- 2. Running engine at 2,000 rpm under no-load (The engine is warmed up to normal operating temperature.), check that the MIL comes on more than 5 times during 10 seconds.

OK or NG

OK >> INSPECTION END

NG (MIL does not come on)>>GO TO 24.

NG (MIL comes on less than 5 times)>>GO TO 31.

23. CHECK HEATED OXYGEN SENSOR 1 (BANK 1) HARNESS

- 1. Turn ignition switch "OFF" and disconnect battery ground cable.
- 2. Disconnect ECM harness connector.
- 3. Disconnect heated oxygen sensor 1 (bank 1) harness connector.
- 4. Check harness continuity between ECM terminal 91 and heated oxygen sensor 1 (bank 1) terminal 1. Refer to Wiring Diagram, <u>EC-214, "BANK 1"</u>.

Continuity should exist.

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

OK or NG

OK >> GO TO 25.

NG >> 1. Repair or replace harness between ECM and heated oxygen sensor 1 (bank 1).

2. GO TO 4.

24. CHECK HEATED OXYGEN SENSOR 1 (BANK 2) HARNESS

- 1. Turn ignition switch "OFF" and disconnect battery ground cable.
- 2. Disconnect ECM harness connector.
- 3. Disconnect heated oxygen sensor 1 (bank 2) harness connector.
- 4. Check harness continuity between ECM terminal 92 and heated oxygen sensor 1 (bank 2) terminal 1. Refer to Wiring Diagram, EC-216, "BANK 2".

Continuity should exist.

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

OK or NG

OK >> GO TO 25.

NG >> 1. Repair or replace harness between ECM and heated oxygen sensor 1 (bank 2).

2. GO TO 4.

25. PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING

- Reconnect ECM harness connector.
- Perform <u>EC-51</u>, "Accelerator <u>Pedal Released Position Learning</u>".

>> GO TO 26.

26. PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Perform EC-51, "Throttle Valve Closed Position Learning".

>> GO TO 27.

27. PERFORM IDLE AIR VOLUME LEARNING

Refer to EC-51, "Idle Air Volume Learning".

Is Idle Air Volume Learning carried out successfully?

YES or NO

YES (With CONSULT-II)>>GO TO 28.

YES (Without CONSULT-II)>>GO TO 29.

>> 1. Follow the instruction of "Idle Air Volume Learning".

2. GO TO 4.

28. снеск "со"%

(P) With CONSULT-II

- Start engine and warm it up until engine coolant temperature indicator points the middle of gauge.
- Turn ignition switch "OFF", wait at least 10 seconds and then turn "ON".
- Select "ENG COOLANT TEMP" in "ACTIVE TEST" mode.
- Set "ENG COOLANT TEMP" to 5°C (41°F) by touching "DWN" and "Qd".
- Start engine and rev it (2,000 to 3,000 rpm) two or three times under no-load, then run engine at idle speed.
- Check "CO"%.

Idle CO: 0.7 – 9.9% and engine runs smoothly.

OK or NG

OK >> GO TO 31. NG >> GO TO 30.

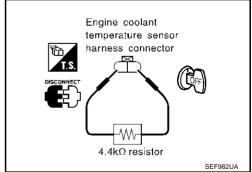
29. CHECK "CO"%

Without CONSULT-II

- 1. Start engine and warm it up until engine coolant temperature indicator points to the middle of gauge.
- 2. Turn ignition switch "OFF".
- 3. Disconnect engine coolant temperature sensor harness connector.
- Connect a resistor (4.4 k Ω) between terminals of engine coolant temperature sensor harness connector.
- Start engine and rev it (2,000 to 3,000 rpm) two or three times under no-load, then run engine at idle speed.
- Check "CO"%.

Idle CO: 0.7 – 9.9% and engine runs smoothly.

After checking "CO"%, turn ignition switch "OFF", disconnect the resistor from the terminals of engine coolant temperature sensor harness connector, and then connect engine coolant temperature sensor harness connector to engine coolant temperature sensor.



ACTIVE TEST

MONITOR

XXX C

XXX rpm

XXX msec

XXX BTDC

ENG COOLANTTEMP

ENG SPEED

INJ PULSE-B1

IGN TIMING

OK or NG

OK >> GO TO 31. NG >> GO TO 30.

$30.\,$ reconnect heated oxygen sensor 1 harness connector

- Turn ignition switch "OFF".
- Reconnect heated oxygen sensor 1 harness connector.

>> GO TO 34.

EC-49 Revision; 2004 April 2003 G35 Sedan

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$\overline{31}$. REPLACE HEATED OXYGEN SENSOR 1

- 1. Stop engine.
- 2. Replace heated oxygen sensor 1 on the malfunctioning bank.

With CONSULT-II>>GO TO 32. Without CONSULT-II>>GO TO 33.

32. CHECK HEATED OXYGEN SENSOR 1 (BANK 1)/(BANK 2) SIGNAL

(II) With CONSULT-II

- 1. Start engine and warm it up until engine coolant temperature indicator points the middle of gauge.
- See "HO2S1 MNTR (B1)/(B2)" in "DATA MONITOR" mode.
- 3. Running engine at 2,000 rpm under no-load (The engine is warmed up to normal operating temperature.), check that the monitor fluctuates between LEAN and RICH more than 5 times during 10 seconds.

1 time: $RICH \rightarrow LEAN \rightarrow RICH$

2 times: $RICH \rightarrow LEAN \rightarrow RICH \rightarrow LEAN \rightarrow RICH$

OK or NG

OK >> GO TO 4. NG >> GO TO 34.

33. CHECK HEATED OXYGEN SENSOR 1 (BANK 1)/(BANK 2) SIGNAL

(R) Without CONSULT-II

- 1. Set ECM to Self-diagnostic mode II (Heated oxygen sensor 1 monitor). Refer to <u>EC-72, "HOW TO SWITCH DIAGNOSTIC TEST MODE"</u>.
- 2. Switch the monitored sensor to the malfunctioning bank. Refer to EC-73, "How to Switch Monitored Sensor From Bank 1 to Bank 2 or Vice Versa".
- 3. Running engine at 2,000 rpm under no-load (The engine is warmed up to normal operating temperature.), check that the MIL comes on more than 5 times during 10 seconds.

OK or NG

OK >> GO TO 4. NG >> GO TO 34.

34. DETECT MALFUNCTIONING PART

Check the following.

- Check fuel pressure regulator and repair or replace if necessary. Refer to <u>EC-53, "Fuel Pressure Check"</u>.
- Check mass air flow sensor and its circuit, and repair or replace if necessary. Refer to <u>EC-170</u>, <u>EC-178</u> and EC-445.
- Check injector and its circuit, and repair or replace if necessary. Refer to <u>EC-601</u>.
- Check engine coolant temperature sensor and its circuit, and repair or replace if necessary. Refer to <u>EC-</u> 190 and EC-204.

OK or NG

OK >> GO TO 36.

NG >> 1. Repair or replace.

2. GO TO 35.

BASIC SERVICE PROCEDURE

[TYPE 1]

35. erase unnecessary dtc

After this inspection, unnecessary DTC might be displayed.

Erase the stored memory in ECM and TCM. Refer to EC-69, "HOW TO ERASE EMISSION-RELATED DIAG-NOSTIC INFORMATION" and AT-40, "HOW TO ERASE DTC".

>> GO TO 4.

36. CHECK ECM FUNCTION

Substitute another known-good ECM to check ECM function. (ECM may be the cause of a incident, but this is the rarely the case.)

Perform initialization of IVNS (NATS) system and registration of IVNS (NATS) ignition key IDs. Refer to BL-127, "ECM Re-communicating Function".

>> GO TO 4.

Accelerator Pedal Released Position Learning DESCRIPTION

"Accelerator Pedal Released Position Learning" is an operation 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 harness connector of accelerator pedal position sensor or ECM is disconnected.

OPERATION PROCEDURE

- 1. Make sure that accelerator pedal is fully released.
- Turn ignition switch "ON" and wait at least 2 seconds.
- Turn ignition switch "OFF" wait at least 10 seconds. 3.
- Turn ignition switch "ON" and wait at least 2 seconds.
- Turn ignition switch "OFF" wait at least 10 seconds.

Throttle Valve Closed Position Learning DESCRIPTION

"Throttle Valve Closed Position Learning" is an operation 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.

OPERATION PROCEDURE

- 1. Make sure that accelerator pedal is fully released.
- Turn ignition switch "ON".
- 3. Turn ignition switch "OFF" wait at least 10 seconds. Make sure that throttle valve moves during above 10 seconds by confirming the operating sound.

Idle Air Volume Learning **DESCRIPTION**

ABS0003N

"Idle Air Volume Learning" is an operation to learn the idle air volume that keeps each engine within the specific range. It must be performed under any of the following conditions:

- Each time electric throttle control actuator or ECM is replaced.
- Idle speed or ignition timing is out of specification.

PREPARATION

Before performing "Idle Air Volume Learning", make sure that all of the following conditions are satisfied. Learning will be cancelled if any of the following conditions are missed for even a moment.

- Battery voltage: More than 12.9V (At idle)
- Engine coolant temperature: 70 100°C (158 212°F)
- PNP switch: ON
- Electric load switch: OFF (Air conditioner, headlamp, rear window defogger)

EC-51 2003 G35 Sedan Revision; 2004 April

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On vehicles equipped with daytime light systems, set lighting switch to the 1st position to light only small lamps.

- Steering wheel: Neutral (Straight-ahead position)
- Vehicle speed: Stopped
- Transmission: Warmed-up

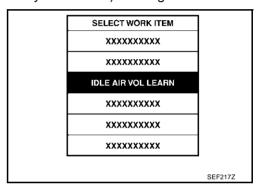
For models with CONSULT-II, drive vehicle until "FLUID TEMP SE" in "DATA MONITOR" mode of "A/T" system indicates less than 0.9V.

For models without CONSULT-II, drive vehicle for 10 minutes.

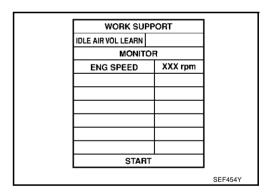
OPERATION PROCEDURE

(P) With CONSULT-II

- 1. Perform EC-51, "Accelerator Pedal Released Position Learning".
- 2. Perform EC-51, "Throttle Valve Closed Position Learning".
- 3. Start engine and warm it up to normal operating temperature.
- 4. Check that all items listed under the topic "PREPARATION" (previously mentioned) are in good order.
- 5. Select "IDLE AIR VOL LEARN" in "WORK SUPPORT" mode.



6. Touch "START" and wait 20 seconds.



- 7. Make sure that "CMPLT" is displayed on CONSULT-II screen. If "CMPLT" is not displayed, "Idle Air Volume Learning" will not be carried out successfully. In this case, find the cause of the incident by referring to the "Diagnostic Procedure" below.
- 8. Rev up the engine two or three times and make sure that idle speed and ignition timing are within the specifications.

ITEM	SPECIFICATION
Idle speed	650±50 rpm (in "P" or "N" position)
Ignition timing	15±5° BTDC (in "P" or "N" position)

WORK SUF		
IDLE AIR VOL LEARN	CMPLT	
MONITO	OR .	
ENG SPEED	XXX rpm	
STAR		
		MBIB0238E

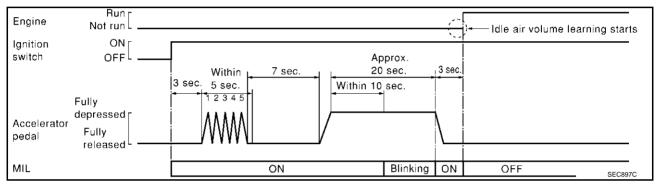
⋈ Without CONSULT-II

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 <u>EC-51</u>, "Accelerator <u>Pedal Released Position Learning"</u>.

[TYPE 1]

- 2. Perform EC-51, "Throttle Valve Closed Position Learning".
- 3. Start engine and warm it up to normal operating temperature.
- 4. Check that all items listed under the topic "PREPARATION" (previously mentioned) are in good order.
- 5. Turn ignition switch "OFF" and wait at least 10 seconds.
- 6. Confirm that accelerator pedal is fully released, turn ignition switch "ON" and wait 3 seconds.
- 7. Repeat the following procedure quickly five times within 5 seconds.
- a. Fully depress the accelerator pedal.
- b. Fully release the accelerator pedal.
- 8. Wait 7 seconds, fully depress the accelerator pedal and keep it for approx. 20 seconds until the MIL stops blinking and turned ON.
- 9. Fully release the accelerator pedal within 3 seconds after the MIL turned ON.
- 10. Start engine and let it idle.
- 11. Wait 20 seconds.



12. Rev up the engine two or three times and make sure that idle speed and ignition timing are within the specifications.

ITEM	SPECIFICATION
Idle speed	650±50 rpm (in "P" or "N" position)
Ignition timing	15±5° BTDC (in "P" or "N" position)

13. If idle speed and ignition timing are not within the specification, "Idle Air Volume Learning" will not be carried out successfully. In this case, find the cause of the incident by referring to the "DIAGNOSTIC PROCEDURE" below.

DIAGNOSTIC PROCEDURE

If idle air volume learning cannot be performed successfully, proceed as follows:

- Check that throttle valve is fully closed.
- 2. Check PCV valve operation.
- 3. Check that downstream of throttle valve is free from air leakage.
- 4. When the above three items check out OK, engine component parts and their installation condition are questionable. Check and eliminate the cause of the incident.

 It is useful to perform EC-131, "TROUBLE DIAGNOSIS SPECIFICATION VALUE".
- 5. If any of the following conditions occur after the engine has started, eliminate the cause of the incident and perform "Idle air volume learning" all over again:
 - Engine stalls.
 - Erroneous idle.

Fuel Pressure Check FUEL PRESSURE RELEASE

(P) With CONSULT-II

1. Turn ignition switch "ON".

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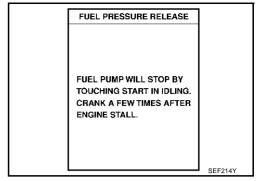
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BASIC SERVICE PROCEDURE

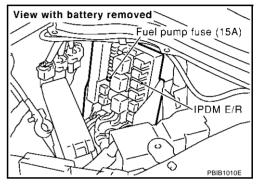
[TYPE 1]

- 2. Perform "FUEL PRESSURE RELEASE" in "WORK SUPPORT" mode with CONSULT-II.
- 3. Start engine.
- 4. After engine stalls, crank it two or three times to release all fuel pressure.
- 5. Turn ignition switch "OFF".



(R) Without CONSULT-II

- 1. Remove fuel pump fuse located in IPDM E/R.
- 2. Start engine.
- 3. 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

Before disconnecting fuel line, release fuel pressure from fuel line to eliminate danger. NOTE:

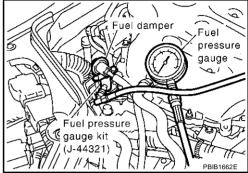
- Prepare pans or saucers under the disconnected fuel line because the fuel may spill out. The fuel pressure cannot be completely released because V35 models do not have fuel return system.
- Use Fuel Pressure Gauge Kit (J-44321) to check fuel pressure.
- 1. Release fuel pressure to zero. Refer to EC-53, "FUEL PRESSURE RELEASE".
- 2. Install the inline fuel quick disconnected fitting between fuel damper and injector tube.
- 3. Connect the fuel pressure test gauge (quick connector adapter hose) to the inline fuel quick disconnected fitting.
- 4. Turn ignition switch ON and check for fuel leakage.
- Start engine and check for fuel leakage.
- 6. Read the indication of fuel pressure gauge.

At idling: Approximately 350 kPa (3.57 kg/cm², 51 psi)

- 7. If result is unsatisfactory, go to next step.
- Check the following.
 - Fuel hoses and fuel tubes for clogging
 - Fuel filter for clogging
 - Fuel pump
 - Fuel pressure regulator for clogging

If OK, replace fuel pressure regulator.

If NG, repair or replace.



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[TYPE 1]

ON BOARD DIAGNOSTIC (OBD) SYSTEM

PFP:00028

Introduction ABS0003F

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	SAE Mode
Diagnostic Trouble Code (DTC)	Mode 3 of SAE J1979
Freeze Frame data	Mode 2 of SAE J1979
System Readiness Test (SRT) code	Mode 1 of SAE J1979
1st Trip Diagnostic Trouble Code (1st Trip DTC)	Mode 7 of SAE J1979
1st Trip Freeze Frame data	
Test values and Test limits	Mode 6 of SAE J1979
Calibration ID	Mode 9 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	Test value
CONSULT-II	×	×	×	×	×	_
GST	×	×*1	×	_	×	×
ECM	×	×*2	_	_	_	_

^{*1: 1}st trip DTCs for self-diagnoses concerning SRT items cannot be shown on the GST display.

The malfunction indicator lamp (MIL) on the instrument panel lights up 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-85.)

Two Trip Detection Logic

ABS0003Q

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 light up 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 lights up. The MIL lights up 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 light up or blink the MIL, and store DTC and Freeze Frame data, even in the 1st trip, as shown below.

×: Applicable —: Not applicable

		MIL				тс	1st trip DTC		
Items	1st trip		2nd trip		1st trip	2nd trip	1st trip	2nd trip	
	Blinking	Lighting up	Blinking	Lighting up	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-16 .)	_	×	_	_	×	_	_	_	
Except above	_	_	_	×	_	×	×	_	

^{*2:} When DTC and 1st trip DTC simultaneously appear on the display, they cannot be clearly distinguished from each other.

[TYPE 1]

Emission-related Diagnostic Information EMISSION-RELATED DIAGNOSTIC INFORMATION ITEMS

ABS0003R

Items	DTC*1			Test value/		Reference
(CONSULT-II screen terms)	CONSULT-II GST* ²	ECM*3	SRT code	Test limit (GST only)	1st trip DTC	page
CAN COMM CIRCUIT	U1000	1000* ⁶	_	_	_	EC-142
CAN COMM CIRCUIT	U1001	1001* ⁶	_	_	×	EC-142
NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED.	P0000	0000	_	_	_	_
INT/V TIM CONT-B1	P0011	0011	_	_	×	EC-145
INT/V TIM CONT-B2	P0021	0021	_	_	×	EC-145
HO2S1 HTR (B1)	P0031	0031	×	×	×* ⁵	EC-154
HO2S1 HTR (B1)	P0032	0032	×	×	×* ⁵	EC-154
HO2S2 HTR (B1)	P0037	0037	×	×	×* ⁵	EC-162
HO2S2 HTR (B1)	P0038	0038	×	×	×* ⁵	EC-162
HO2S1 HTR (B2)	P0051	0051	×	×	×* ⁵	EC-154
HO2S1 HTR (B2)	P0052	0052	×	×	×* ⁵	EC-154
HO2S2 HTR (B2)	P0057	0057	×	×	×* ⁵	EC-162
HO2S2 HTR (B2)	P0058	0058	×	×	×* ⁵	EC-162
MAF SEN/CIRCUIT	P0101	0101	<u> </u>	_	_	EC-170
MAF SEN/CIRCUIT	P0102	0102	_	_	_	EC-178
MAF SEN/CIRCUIT	P0103	0103	_	_	_	EC-178
IAT SEN/CIRCUIT	P0112	0112	_	_	×	EC-185
IAT SEN/CIRCUIT	P0113	0113	_	_	×	EC-185
ECT SEN/CIRCUIT	P0117	0117	_	_	_	EC-190
ECT SEN/CIRCUIT	P0118	0118	_	_	_	EC-190
TP SEN/CIRCUIT	P0121	0121	_	_	_	EC-195
TP SEN/CIRCUIT	P0122	0122	_	_	_	EC-203
TP SEN/CIRCUIT	P0123	0123	_	_	_	EC-203
ECT SENSOR	P0125	0125	_	_	_	EC-204
IAT SENSOR	P0127	0127	_	_	×	EC-207
THERMSTAT FNCTN	P0128	0128	_	_	×	EC-210
HO2S1 (B1)	P0132	0132	×	×	×* ⁵	EC-212
HO2S1 (B1)	P0133	0133	×	×	×* ⁵	EC-221
HO2S1 (B1)	P0134	0134	×	×	×* ⁵	EC-234
HO2S2 (B1)	P0138	0138	×	×	×* ⁵	EC-244
HO2S2 (B1)	P0139	0139	×	×	×* ⁵	EC-253
HO2S1 (B2)	P0152	0152	×	×	×* ⁵	EC-212
HO2S1 (B2)	P0153	0153	×	×	×* ⁵	EC-221
HO2S1 (B2)	P0154	0154	×	×	×* ⁵	EC-234
HO2S2 (B2)	P0158	0158	×	×	×* ⁵	EC-244
HO2S2 (B2)	P0159	0159	×	×	×* ⁵	EC-253

[TYPE 1]

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Items	CONSULT-II	C* ¹	SRT code	Test value/ Test limit	1st trip DTC	Reference
(CONSULT-II screen terms)	GST*2	ECM* ³	OITT COGC	(GST only)	131 (11) 151 (1	page
FUEL SYS-LEAN-B1	P0171	0171	-	_	×	EC-264
FUEL SYS-RICH-B1	P0172	0172	_	_	×	EC-273
FUEL SYS-LEAN-B2	P0174	0174	_	_	×	EC-264
FUEL SYS-RICH-B2	P0175	0175	_	_	×	EC-273
FTT SENSOR	P0181	0181	_	_	×	EC-281
FTT SEN/CIRCUIT	P0182	0182	_	_	×	EC-286
FTT SEN/CIRCUIT	P0183	0183	_	_	×	EC-286
TP SENSOR	P0221	0221	_	_	_	EC-290
TP SEN 1/CIRC	P0222	0222	_	_	_	EC-297
TP SEN 1/CIRC	P0223	0223	_	_	_	EC-297
APP SENSOR	P0226	0226	_	_	_	EC-304
APP SEN 1/CIRC	P0227	0227	_	_	_	EC-311
APP SEN 1/CIRC	P0228	0228	_	_	_	EC-311
MULTI CYL MISFIRE	P0300	0300	_	_	×	EC-317
CYL 1 MISFIRE	P0301	0301	_	_	×	EC-317
CYL 2 MISFIRE	P0302	0302	_	_	×	EC-317
CYL 3 MISFIRE	P0303	0303	_	_	×	EC-317
CYL 4 MISFIRE	P0304	0304	_	_	×	EC-317
CYL 5 MISFIRE	P0305	0305	_	_	×	EC-317
CYL 6 MISFIRE	P0306	0306	_	_	×	EC-317
KNOCK SEN/CIRC-B1	P0327	0327	_	_	×	EC-323
KNOCK SEN/CIRC-B1	P0328	0328	_	_	×	EC-323
CKP SEN/CIRCUIT	P0335	0335	_	_	×	EC-327
CMP SEN/CIRC-B1	P0340	0340	_	_	×	EC-334
CMP SEN/CIRC-B2	P0345	0345	_	_	×	EC-334
TW CATALYST SYS-B1	P0420	0420	×	×	×* ⁵	EC-343
TW CATALYST SYS-B2	P0430	0430	×	×	×* ⁵	EC-343
EVAP PURG FLOW/MON	P0441	0441	×	×	×* ⁵	EC-348
EVAP SMALL LEAK	P0442	0442	×	×	×* ⁵	EC-353
PURG VOLUME CONT/V	P0444	0444	_	_	×	EC-363
PURG VOLUME CONT/V	P0445	0445	_	_	×	EC-363
VENT CONTROL VALVE	P0447	0447	_	_	×	EC-369
EVAP SYS PRES SEN*8	P0451* ⁹	0451* ⁹	_	_	×	EC-376
EVAP SYS PRES SEN	P0452	0452	_	_	×	EC-379
EVAP SYS PRES SEN	P0453	0453	_	_	×	EC-385
EVAP GROSS LEAK	P0455	0455	_	×	×* ⁵	EC-393
EVAP VERY SML LEAK	P0456	0456	×* ⁴	×	×* ⁵	EC-401
FUEL LEV SEN SLOSH	P0460	0460	_	_	×	EC-411
FUEL LEVEL SENSOR	P0461	0461	_	_	×	EC-416
FUEL LEVL SEN/CIRC	P0462	0462	_	_	×	EC-418
FUEL LEVL SEN/CIRC	P0463	0463	_	_	×	EC-418

[TYPE 1]

						[1176.1]	
lta-ma	DTC)* ¹		Test value/		Defenses	
Items (CONSULT-II screen terms)	CONSULT-II GST* ²	ECM*3	SRT code	Test limit (GST only)	1st trip DTC	Reference page	
VEH SPEED SEN/CIRC*7	P0500	0500	_	_	×	EC-423	
ISC SYSTEM	P0506	0506	_	_	×	EC-425	
ISC SYSTEM	P0507	0507	_	_	×	EC-427	
PW ST P SEN/CIRC	P0550	0550	_	_	×	EC-429	
ECM	P0605	0605	_	_	× or —	EC-434	
MIL/CIRC	P0650	0650	_	_	×	EC-437	
PNP SW/CIRC	P0705	0705	_	_	×	<u>AT-110</u>	
ATF TEMP SEN/CIRC	P0710	0710	_	_	×	AT-155	
VEH SPD SEN/CIR AT*7	P0720	0720	_	_	×	<u>AT-115</u>	
ENGINE SPEED SIG	P0725	0725	_	_	×	AT-120	
TCC SOLENOID/CIRC	P0740	0740	_	_	×	AT-122	
A/T TCC S/V FNCTN	P0744	0744	_	_	×	AT-127	
L/PRESS SOL/CIRC	P0745	0745	_	_	×	AT-132	
ECM BACK UP/CIRC	P1065	1065	_	_	×	EC-441	
MAF SENSOR	P1102	1102	_	_	×	EC-445	
ETC ACTR	P1121	1121	_	_	_	EC-451	
ETC FUNCTION/CIRC	P1122	1122	_	_	_	EC-453	
ETC MOT PWR	P1124	1124	_	_	_	EC-460	
ETC MOT PWR	P1126	1126	_	_	_	EC-460	
ETC MOT	P1128	1128	_	_	_	EC-465	
HO2S1 (B1)	P1143	1143	×	×	×* ⁵	EC-470	
HO2S1 (B1)	P1144	1144	×	×	×* ⁵	EC-476	
HO2S2 (B1)	P1146	1146	×	×	×* ⁵	EC-483	
HO2S2 (B1)	P1147	1147	×	×	×* ⁵	EC-494	
CLOSED LOOP-B1	P1148	1148	_	_	_	EC-505	
HO2S1 (B2)	P1163	1163	×	×	×* ⁵	EC-470	
HO2S1 (B2)	P1164	1164	×	×	×* ⁵	EC-476	
HO2S2 (B2)	P1166	1166	×	×	×* ⁵	EC-483	
HO2S2 (B2)	P1167	1167	×	×	×* ⁵	EC-494	
CLOSED LOOP-B2	P1168	1168	_	_	_	EC-505	
TCS C/U FUNCTN	P1211	1211	_	_	×	EC-507	
TCS/CIRC	P1212	1212	_	_	×	EC-508	
ENG OVER TEMP	P1217	1217	_	_	_	EC-509	
TP SEN 2/CIRC	P1223	1223	_	_	_	EC-521	
TP SEN 2/CIRC	P1224	1224	_	_	_	EC-521	
CTP LEARNING	P1225	1225	_	_	×	EC-528	
CTP LEARNING	P1226	1226	_	_	×	EC-530	
APP SEN 2/CIRC	P1227	1227	_	_	_	EC-532	
APP SEN 2/CIRC	P1228	1228	_	_	_	EC-532	
SENSOR POWER/CIRC	P1229	1229	_	_	_	EC-538	
PURG VOLUME CONT/V	P1444	1444	_	_	×	EC-542	

Revision; 2004 April EC-59 2003 G35 Sedan

Items	DTC*1			Test value/		Reference
(CONSULT-II screen terms)	CONSULT-II GST* ²	ECM* ³	SRT code	Test limit (GST only)	1st trip DTC	page
VENT CONTROL VALVE	P1446	1446	_	_	×	EC-550
FUEL LEVEL SEN/CIRC	P1464	1464	_	_	×	EC-557
ASCD SW	P1564	1564	_	_	×	EC-560
ASCD BRAKE SW	P1572	1572	_	_	×	EC-567
ASCD VHL SPD SEN	P1574	1574	_	_	×	EC-576
NATS MALFUNCTION	P1610 - P1615	1610 - 1615	_	_	×	EC-71
TPV SEN/CIRC A/T	P1705	1705	_	_	_	<u>AT-152</u>
P-N POS SW/CIRCUIT	P1706	1706	_	_	×	EC-578
TURBINE REV S/CIRC	P1716	1716	_	_	×	<u>AT-161</u>
A/T INTERLOCK	P1730	1730	_	_	_	<u>AT-168</u>
I/C SOLENOID/CIRC	P1752	1752	_	_	_	<u>AT-179</u>
I/C SOLENOID FNCTN	P1754	1754	_	_	_	<u>AT-184</u>
FR/B SOLENOID/CIRC	P1757	1757	_	_	_	<u>AT-188</u>
FR/B SOLENOID/CIRC	P1759	1759	_	_	_	<u>AT-193</u>
D/C SOLENOID/CIRC	P1762	1762	_	_	_	<u>AT-198</u>
D/C SOLENOID FNCTN	P1764	1764	_	_	_	AT-203
HLR/C SOL/CIRC	P1767	1767	_	_	_	<u>AT-207</u>
HLR/C SOL FNCTN	P1769	1769	_	_	_	AT-212
LC/B SOLENOID/CIRC	P1772	1772	_	_	_	AT-217
LC/B SOLENOID FNCT	P1774	1774	_	_	_	AT-222
BRAKE SW/CIRCUIT	P1805	1805	_	_	×	EC-584

^{*1: 1}st trip DTC No. is the same as DTC No.

DTC AND 1ST TRIP DTC

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 reoccur, the 1st trip DTC will not be displayed.

If a malfunction is detected during the 1st trip, the 1st trip DTC is stored in the ECM memory. The MIL will not light up (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 lights up. 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 stored 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 light up 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 <u>EC-69</u>, "HOW <u>TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION"</u>.

For malfunctions in which 1st trip DTCs are displayed, refer to EC-57, "EMISSION-RELATED DIAGNOSTIC INFORMATION ITEMS". 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-II.

^{*2:} This number is prescribed by SAE J2012.

^{*3:} In Diagnostic Test Mode II (Self-diagnostic results), this number is controlled by NISSAN.

^{*4:} SRT code will not be set if the self-diagnostic result is NG.

^{*5:} This is not displayed with GST.

^{*6:} The troubleshooting for this DTC needs CONSULT-II.

^{*7:} When the fail-safe operations for both self-diagnoses occur at the same time, the MIL illuminates.

^{*8:} This CONSULT-II screen term is displayed with CONSULT-II program card released after AED02D.

^{*9:} This DTC is applicable to vehicle with serial No. of 303268 and after.

[TYPE 1]

1st trip DTC is specified in Mode 7 of SAE J1979. 1st trip DTC detection occurs without lighting up 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 II, refer to EC-81, "WORK FLOW". Then perform "DTC Confirmation Procedure" or "Overall Function Check" to try to duplicate the malfunction. If the malfunction is duplicated, the item requires repair.

How to Read DTC and 1st Trip DTC

DTC and 1st trip DTC can be read by the following methods.

(P) With CONSULT-II

With GST

CONSULT-II or GST (Generic Scan Tool) Examples: P0340, P1148, P1706, etc.

These DTCs are prescribed by SAE J2012.

(CONSULT-II 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, 1148, 1706, 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 or 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-II can identify malfunction status as shown below. Therefore, using CONSULT-II (if available) is recommended.

A sample of CONSULT-II display for DTC and 1st trip DTC is shown below. DTC or 1st trip DTC of a malfunction is displayed in SELF-DIAGNOSTIC RESULTS mode of CONSULT-II. 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]".

	SELF DIAG RESULTS		SELF DIAG RES		SELF DIAG RESULTS	
	DTC RESULTS	TIME	DTC RESULTS		TIME	
DTC display	CKP SEN/CIRCUIT [P0335]	0	CKP SEN/CIRCUIT [P0335]	1st trip	1t	
			ay	DTC display		

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, 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-II or GST. The 1st trip freeze frame data can only be displayed on the CONSULT-II screen, not on the GST. For details, see <u>EC-115, "Freeze Frame Data and 1st Trip Freeze Frame Data".</u>

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.

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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 stored 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 EC-69, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION".

SYSTEM READINESS TEST (SRT) CODE

System Readiness Test (SRT) code is specified in Mode 1 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.

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.

[TYPE 1]

SRT Item

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

SRT item (CONSULT-II indica- tion)	Perfor- mance Pri- ority*1	Required self-diagnostic items to set the SRT to "CMPLT"	Corresponding DTC No.	
CATALYST	2	Three way catalyst function	P0420, P0430	
EVAP SYSTEM 1		EVAP control system	P0442	
	2	EVAP control system	P0456	
	2	EVAP control system purge flow monitoring	P0441	
HO2S	2	Heated oxygen sensor 1	P0132, P0152	
		Heated oxygen sensor 1	P0133, P0153	
		Heated oxygen sensor 1	P0134, P0154	
		Heated oxygen sensor 1	P1143, P1163	
		Heated oxygen sensor 1	P1144, P1164	
		Heated oxygen sensor 2	P0138, P0158	
		Heated oxygen sensor 2	P0139, P0159	
		Heated oxygen sensor 2	P1146, P1166	
		Heated oxygen sensor 2	P1147, P1167	
HO2S HTR	2	Heated oxygen sensor 1 heater	P0031, P0032, P0051, P0052	
		Heated oxygen sensor 2 heater	P0037, P0038, P0057, P0058	

^{*1:} If completion of several SRTs is required, perform driving patterns (DTC confirmation procedure), one by one based on the priority for models with CONSULT-II.

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.

Self-diagnosis result		Example				
		Diagnosis	\leftarrow ON \rightarrow C	•	on cycle \rightarrow OFF \leftarrow ON \rightarrow C	OFF ← ON →
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.

Revision; 2004 April EC-63 2003 G35 Sedan

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[TYPE 1]

-: Self-diagnosis is not carried out.

When all SRT related self-diagnoses showed 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 showed 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 showed NG results in 2 consecutive cycles, the SRT will also indicate "CMPLT". → Case 3 above

The table above shows that the minimum number of cycles for setting SRT as "INCMP" is one (1) for each self-diagnosis (Case 1 & 2) or 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.
- When, during SRT driving pattern, 1st trip DTC (NG) is detected prior to "CMPLT" of SRT, the self-diagnosis memory must be erased from ECM after repair.
- If the 1st trip DTC is erased, all the SRT will indicate "INCMP".

NOTE:

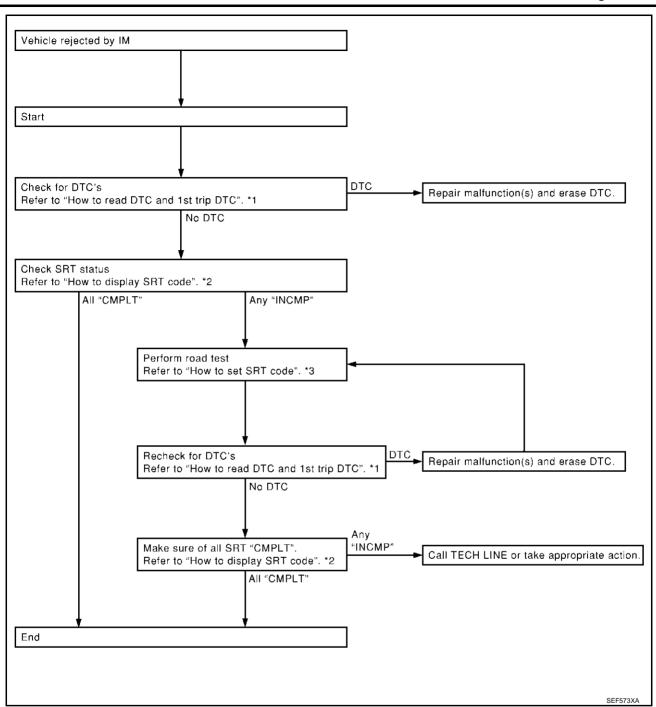
SRT can be set as "CMPLT" together with the DTC(s). Therefore, DTC check must always be carried out prior to the state emission inspection even though the SRT indicates "CMPLT".

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 page.

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How to Display SRT Code

(P) WITH CONSULT-II

*1 EC-61

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

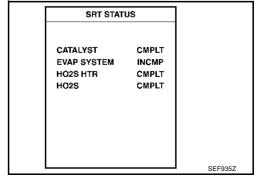
*2 EC-65

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

A sample of CONSULT-II display for SRT code is shown at right. "INCMP" means the self-diagnosis is incomplete and SRT is not set. "CMPLT" means the self-diagnosis is complete and SRT is set.

WITH GST

Selecting Mode 1 with GST (Generic Scan Tool)



*3 EC-66

[TYPE 1]

How to Set SRT Code

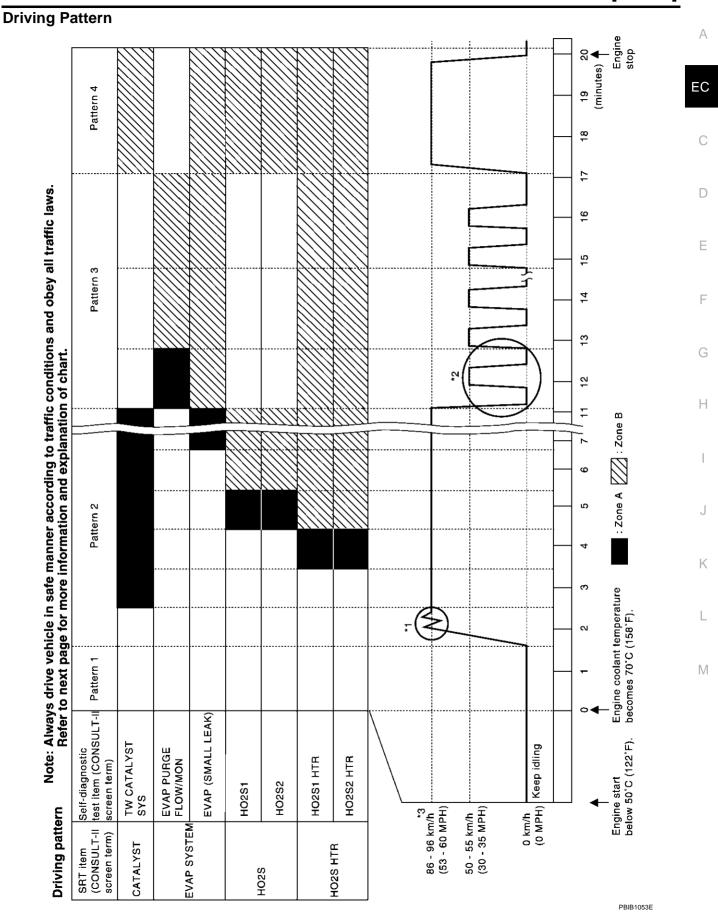
To set all SRT codes, self-diagnosis for the items indicated above must be performed one or more times. Each diagnosis may require a long period of actual driving under various conditions.

(1) WITH CONSULT-II

Perform corresponding DTC Confirmation Procedure one by one based on "Performance Priority" in the table on <u>EC-63</u>, "<u>SRT Item</u>".

WITHOUT CONSULT-II

The most efficient driving pattern in which SRT codes can be properly set is explained on the next page. The driving pattern should be performed one or more times to set all SRT codes.



- 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 terminal 93 and ground is 3.0 - 4.3V).
- 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 93 and ground is lower than 1.4V).
- The engine is started at the fuel tank temperature of warmer than 0°C (32°F) (where the voltage between the ECM terminal 75 and ground is less than 4.1V).

Pattern 2:

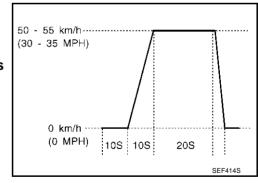
When steady-state driving is performed again even after it is interrupted, each diagnosis can be conducted. In this case, the time required for diagnosis may be extended.

Pattern 3:

The driving pattern outlined in *2 must be repeated at least 3 times.

Pattern 4:

- Tests are performed after the engine has been operated for at least 17 minutes.
- The accelerator pedal must be held very steady during steady-state driving.
- If the accelerator pedal is moved, the test must be conducted all over 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: Operate the vehicle in the following driving pattern.
- 1. Decelerate vehicle to 0 km/h (0 MPH) and let engine idle.
- Repeat driving pattern shown at right at least 10 times.
- During acceleration, hold the accelerator pedal as steady as possible.
- *3: Checking the vehicle speed with GST is advised.



Suggested Transmission Gear Position

Set the selector lever in the "D" position.

TEST VALUE AND TEST LIMIT (GST ONLY — NOT APPLICABLE TO CONSULT-II)

The following is the information specified in Mode 6 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.

Items for which these data (test value and test limit) are displayed are the same as SRT code items (30 test items).

These data (test value and test limit) are specified by Test ID (TID) and Component ID (CID) and can be displayed on the GST screen.

[TYPE 1]

					[,		
				×: Applicable -	-: Not applicable		
SRT item	Self-diagnostic test item	Test value (GST display)	Test limit	Application	Α	
SKT Item	Sen-diagnostic test item	TID	CID	Test iiiiiit	Application		
	Three way catalyst function (Bank 1)	01H	01H	Max.	×	EC	
CATALYST	Tillee way catalyst function (Bank 1)	02H	81H	Min.	×		
CATALTST	Three way catalyst function (Bank 2)	03H	02H	Max.	×	С	
	Three way catalyst function (bank 2)	04H	82H	Min.	×		
	EVAP control system (Small leak)	05H	03H	Max.	×		
EVAP SYSTEM	EVAP control system purge flow monitoring	06H	83H	Min.	×	Ь	
	EVAP control system (Very small leak)	07H	03H	Max.	×	D	
		09H	04H	Max.	×		
		0AH	84H	Min.	×	Е	
	Heated oxygen sensor 1 (Bank 1)	0BH	04H	Max.	×		
		0CH	04H	Max.	×		
		0DH	04H	Max.	×	F	
		11H	05H	Max.			
		12H	85H	Min.		G	
	Heated oxygen sensor 1 (Bank 2)	13H	05H	Max.	×		
11000		14H	05H	Max.	×		
HO2S		15H	05H	Max.	×	Н	
		19H	86H Min. ×	×			
	Heated evigen concer 2 (Book 4)	1AH	86H	Min.	×	· 	
	Heated oxygen sensor 2 (Bank 1)	1BH	06H	Max.	×		
		1CH	06H	Max.	×	-	
		21H	87H	Min.	×	J	
	Handad survey assess 0 (Bardy 0)	22H	87H	Min.	×		
	Heated oxygen sensor 2 (Bank 2)	23H	07H	Max.	×	- 17	
		24H	07H	Max.	×	K	
	Hantadayanaa ayaara Ahaataa (Baala A)	29H	08H	Max.	×		
11000170	Heated oxygen sensor 1 heater (Bank 1)	2AH	88H	Min.			
	11	2BH	09H	Max.	л. ×		
	Heated oxygen sensor 1 heater (Bank 2)	2CH	89H	Min.	×		
HO2S HTR		2DH	0AH	Max.			
	Heated oxygen sensor 2 heater (Bank 1)				×		
	Heated owners conserve (Best C)	2FH	0BH	Max.	×		
	Heated oxygen sensor 2 heater (Bank 2)	30H	8BH	Min.	×		

HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION How to Erase DTC

(P) With CONSULT-II

The emission related diagnostic information in the ECM can be erased by selecting "ERASE" in the "SELF-DIAG RESULTS" mode with CONSULT-II.

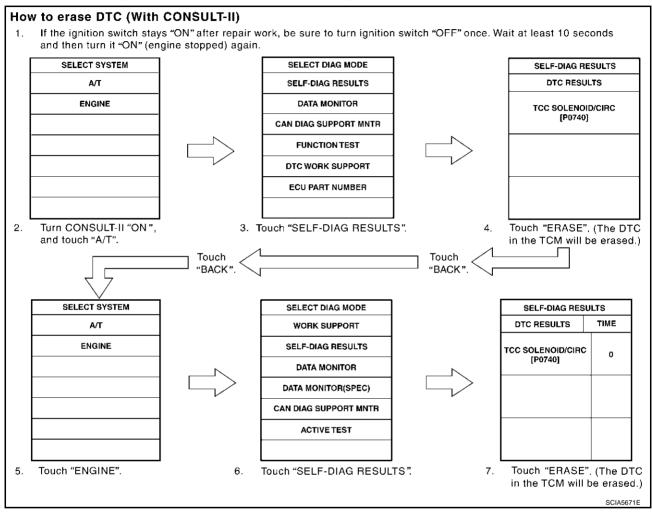
If DTCs are displayed for both ECM and TCM (Transmission control module), they need to be erased individually from the ECM and TCM (Transmission control module).

NOTE

If the DTC is not for A/T related items (see EC-16), skip steps 2 through 4.

1. 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.

- 2. Turn CONSULT-II "ON" and touch "A/T".
- 3. Touch "SELF-DIAG RESULTS".
- Touch "ERASE". [The DTC in the TCM (Transmission control module) will be erased.] Then touch "BACK" twice.
- 5. Touch "ENGINE".
- 6. Touch "SELF-DIAG RESULTS".
- 7. Touch "ERASE". (The DTC in the ECM will be erased.)



With GST

The emission related diagnostic information in the ECM can be erased by selecting Mode 4 with GST.

NOTE:

If the DTC is not for A/T related items (see EC-16), skip step 2.

- 1. 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.
- Perform "SELF-DIAGNOSTIC PROCEDURE (Without CONSULT-II)" in AT section titled "TROUBLE DIAGNOSIS", "Self-diagnosis". (The engine warm-up step can be skipped when performing the diagnosis only to erase the DTC.)
- Select Mode 4 with GST (Generic Scan Tool).

No Tools

- 1. 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.
- Change the diagnostic test mode from Mode II to Mode I by depressing the accelerator pedal. Refer to <u>EC-72</u>, "HOW TO SWITCH DIAGNOSTIC TEST MODE".
- If the battery is disconnected, the emission-related diagnostic information will be lost within 24 hours.

[TYPE 1]

- 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
- Others

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.

IVIS (Infiniti Vehicle Immobilizer System — NATS)

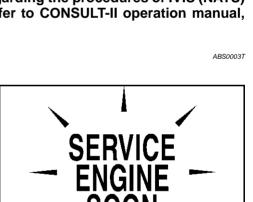
- If the security indicator lights up with the ignition switch in the "ON" position or "NATS MALFUNCTION" is displayed on "SELF-DIAG RESULTS" screen, perform self-diagnostic results mode with CONSULT-II using NATS program card. Refer to BL-125, "IVIS (INFINITI VEHICLE IMMOBILIZER SYSTEM-NATS)".
- Confirm no self-diagnostic results of IVIS (NATS) is displayed before touching "ERASE" in "SELF-DIAG RESULTS" mode with CONSULT-II.
- When replacing ECM, initialization of IVIS (NATS) system and registration of all IVIS (NATS) ignition key IDs must be carried out with CONSULT-II using NATS program card.

Therefore, be sure to receive all keys from vehicle owner. Regarding the procedures of IVIS (NATS) initialization and IVIS (NATS) ignition key ID registration, refer to CONSULT-II operation manual, IVIS/NVIS.

Malfunction Indicator Lamp (MIL) DESCRIPTION

The MIL is located on the instrument panel.

- 1. The MIL will light up when the ignition switch is turned ON without the engine running. This is a bulb check. If the MIL does not light up, refer to DI-30, "WARNING LAMPS", or see EC-437.
- When the engine is started, the MIL should go off. If the MIL remains on, the on board diagnostic system has detected an engine system malfunction.



SELF DIAG RESULTS

n

DTC RESULTS

NATS MALFUNCTION

[P1610]

EC

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ON BOARD DIAGNOSTIC SYSTEM FUNCTION

The on board diagnostic system has the following four functions.

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	This is a usual driving condition. When a malfunction is detected twice in two consecutive driving cycles (two trip detection logic), the MIL will light up to inform the driver that a malfunction has been detected. The following malfunctions will light up 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.
	Engine running	HEATED OXYGEN SENSOR 1 MONITOR	This function allows the fuel mixture condition (lean or rich), monitored by heated oxygen sensor 1, to be read.

MIL Flashing Without DTC

If the ECM is in Diagnostic Test Mode II, MIL may flash when engine is running. In this case, check ECM diagnostic test mode. EC-72, "HOW TO SWITCH DIAGNOSTIC TEST MODE".

How to switch the diagnostic test (function) modes, and details of the above functions are described later. <u>EC-72</u>, "HOW TO SWITCH DIAGNOSTIC TEST MODE" .

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
- 1st trip freeze frame data
- System readiness test (SRT) codes
- Test values
- Others

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.
- Always ECM returns to Diagnostic Test Mode I after ignition switch is turned "OFF".

[TYPE 1]

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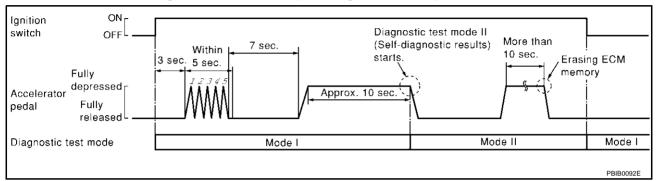
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How to Set Diagnostic Test Mode II (Self-diagnostic Results)

- 1. Confirm that accelerator pedal is fully released, turn ignition switch "ON" and wait 3 seconds.
- 2. Repeat the following procedure quickly five times within 5 seconds.
- a. Fully depress the accelerator pedal.
- b. Fully release the accelerator pedal.
- Wait 7 seconds, fully depress the accelerator pedal and keep it for approx. 10 seconds until the MIL starts blinking.
- Fully release the accelerator pedal.
 ECM has entered to Diagnostic Test Mode II (Self-diagnostic results).



How to Set Diagnostic Test Mode II (Heated Oxygen Sensor 1 Monitor)

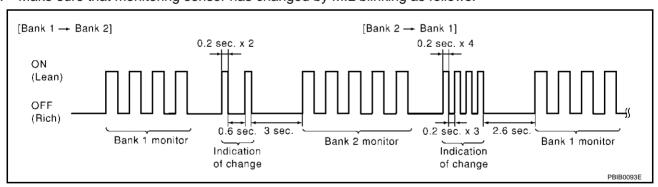
- 1. Set the ECM in Diagnostic Test Mode II (Self-diagnostic results). Refer to <u>EC-73</u>, "How to <u>Set Diagnostic Test Mode II (Self-diagnostic Results)"</u>.
- Start Engine.

ECM has entered to Diagnostic Test Mode II (Heated oxygen sensor 1 monitor).

ECM will start heated oxygen sensor 1 monitoring from the bank 1 sensor.

How to Switch Monitored Sensor From Bank 1 to Bank 2 or Vice Versa

- 1. Fully depress the accelerator pedal quickly and then release it immediately.
- 2. Make sure that monitoring sensor has changed by MIL blinking as follows.



How to Erase Diagnostic Test Mode II (Self-diagnostic Results)

- 1. Set ECM in Diagnostic Test Mode II (Self-diagnostic results). Refer to <u>EC-73</u>, "How to <u>Set Diagnostic Test Mode II</u> (Self-diagnostic Results)".
- Fully depress the accelerator pedal and keep it 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.

DIAGNOSTIC TEST MODE I — BULB CHECK

In this mode, the MIL on the instrument panel should stay ON. If it remains OFF, check the bulb. Refer to $\underline{\text{DI-}}$ 30, "WARNING LAMPS" or see $\underline{\text{EC-437}}$.

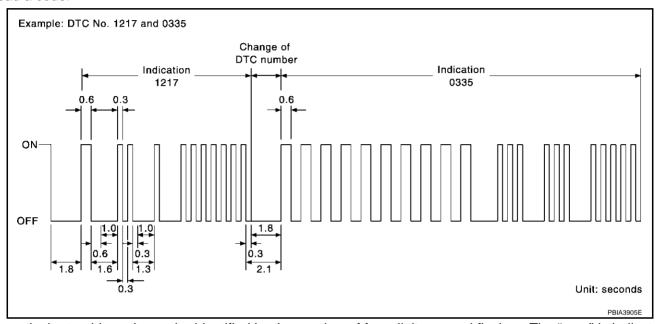
DIAGNOSTIC TEST MODE I — MALFUNCTION WARNING

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

These DTC numbers are 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-II 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 flashes. The "zero" is indicated by the number of ten flashes. The length of time the 1,000th-digit numeral flashes 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-second ON and 0.3-second 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-second OFF.

In this way, all the detected malfunctions are classified by their DTC numbers. The DTC "0000" refers to no malfunction. (See <u>EC-16</u>, "INDEX FOR DTC")

How to Erase Diagnostic Test Mode II (Self-diagnostic Results)

The DTC can be erased from the back up memory in the ECM by depressing accelerator pedal. Refer to EC-73, "How to Erase Diagnostic Test Mode II (Self-diagnostic Results)".

- If the battery is disconnected, the DTC will be lost from the backup memory within 24 hours.
- Be careful not to erase the stored memory before starting trouble diagnoses.

DIAGNOSTIC TEST MODE II — HEATED OXYGEN SENSOR 1 MONITOR

In this mode, the MIL displays the condition of the fuel mixture (lean or rich) which is monitored by the heated oxygen sensor 1.

MIL	Fuel mixture condition in the exhaust gas	Air fuel ratio feedback control condition
ON	Lean	Closed loop system
OFF	Rich	Closed loop system
*Remains ON or OFF	Any condition	Open loop system

^{*:} Maintains conditions just before switching to open loop.

To check the heated oxygen sensor 1 function, start engine in the Diagnostic Test Mode II and warm it up until engine coolant temperature indicator points to the middle of the gauge.

Next run engine at about 2,000 rpm for about 2 minutes under no-load conditions. Then make sure that the MIL comes ON more than 5 times within 10 seconds with engine running at 2,000 rpm under no-load.

ON BOARD DIAGNOSTIC (OBD) SYSTEM

[TYPE 1]

OBD System Operation Chart RELATIONSHIP BETWEEN MIL, 1ST TRIP DTC, DTC, AND DETECTABLE ITEMS

RS000311

- 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. For details, refer to EC-56, "Two Trip Detection Logic".
- The MIL will go off after the vehicle is driven 3 times with no malfunction. The 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-II 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 (goes 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 EC-77.

For details about patterns "A" and "B" under "Other", see EC-79.

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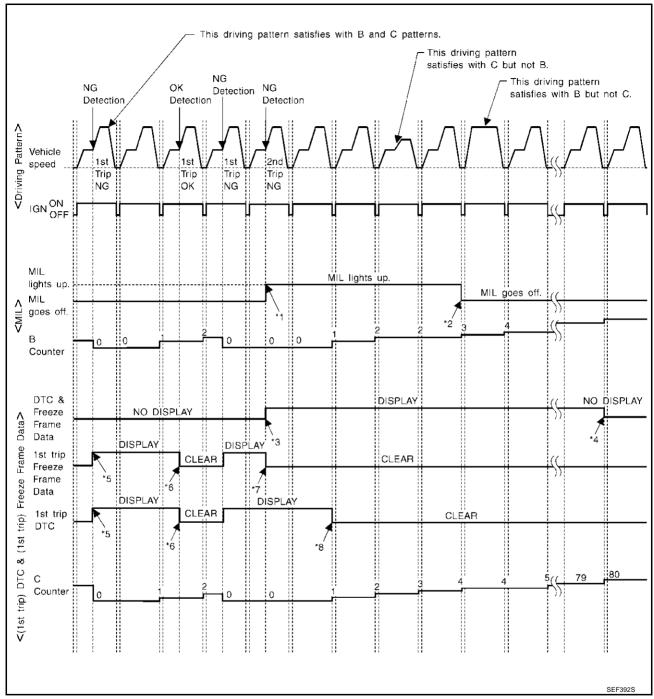
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^{*1:} Clear timing is at the moment OK is detected.

^{*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"



- *1: When the same malfunction is detected in two consecutive trips, MIL will light up.
- *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.

- MIL will go 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.

ON BOARD DIAGNOSTIC (OBD) SYSTEM

[TYPE 1]

EXPLANATION FOR DRIVING PATTERNS FOR "MISFIRE <EXHAUST QUALITY DETERIORA-TION>", "FUEL INJECTION SYSTEM"

<Driving Pattern B>

Driving pattern B means the vehicle operation as follows:

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 malfunction.
- The MIL will go off when the B counter reaches 3. (*2 in "OBD SYSTEM OPERATION CHART")

<Driving Pattern C>

Driving pattern C means the vehicle operation as follows:

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 follows:

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 is 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.

EC

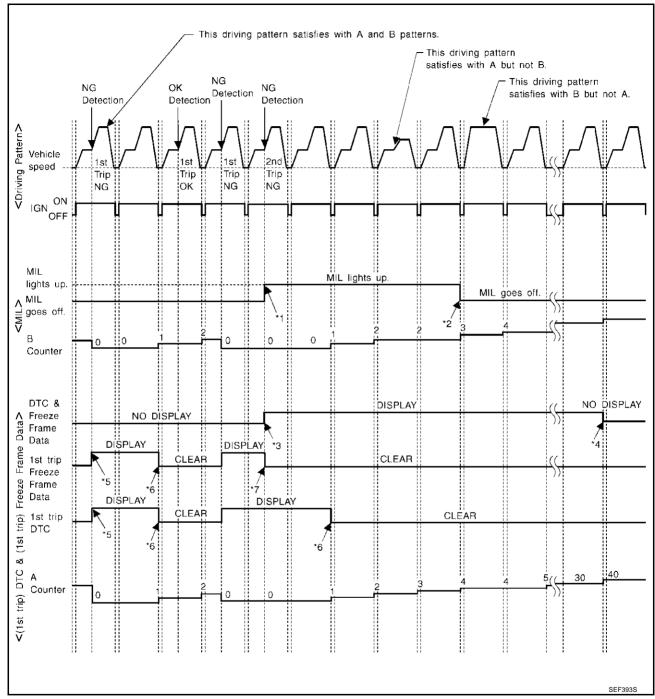
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RELATIONSHIP BETWEEN MIL, DTC, 1ST TRIP DTC AND DRIVING PATTERNS <u>EXCEPT</u> FOR "MISFIRE <EXHAUST QUALITY DETERIORATION>", "FUEL INJECTION SYSTEM"



- *1: When the same malfunction is detected in two consecutive trips, MIL will light up.
- *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.)
- *7: When the same malfunction is detected in the 2nd trip, the 1st trip freeze frame data will be cleared.

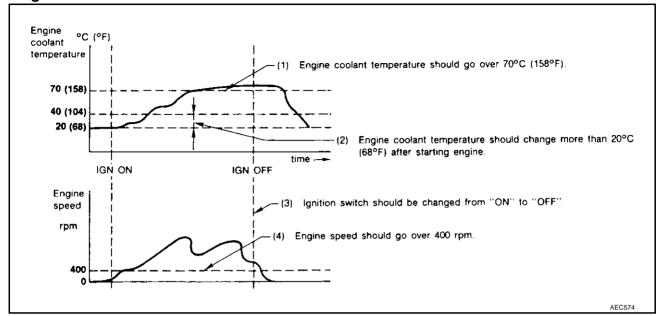
- MIL will go off after vehicle is driven 3 times (pattern B) without any malfunctions.
- *5: When a malfunction is detected for the first time, the 1st trip DTC and the 1st trip freeze frame data will be stored in ECM.
- *3: When the same malfunction is detected in two consecutive trips, the DTC and the 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.

ON BOARD DIAGNOSTIC (OBD) SYSTEM

[TYPE 1]

EXPLANATION FOR DRIVING PATTERNS <u>EXCEPT</u> 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 the vehicle operation as follows:

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 go off when the B counter reaches 3 (*2 in "OBD SYSTEM OPERATION CHART").

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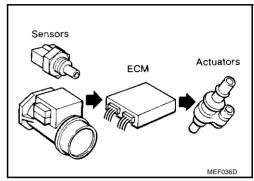
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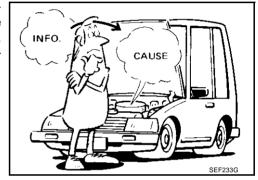
Trouble Diagnosis Introduction INTRODUCTION

ABS0003V

The engine has an ECM to control major systems such as fuel control, ignition control, idle air control system, etc. The ECM accepts input signals from sensors and instantly drives actuators. It is essential that both input and output signals are proper and stable. At the same time, it is important that there are no malfunctions such as vacuum leaks, fouled spark plugs, or other malfunctions with the engine.



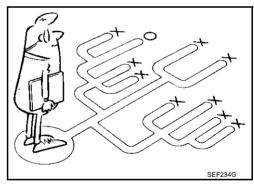
It is much more difficult to diagnose a incident that occurs intermittently rather than continuously. Most intermittent incidents are caused by poor electric connections or improper wiring. In this case, careful checking of suspected circuits may help prevent the replacement of good parts.



A visual check only may not find the cause of the incidents. A road test with CONSULT-II (or GST) or a circuit tester connected should be performed. Follow the "Work Flow" on $\underline{\text{EC-81}}$.

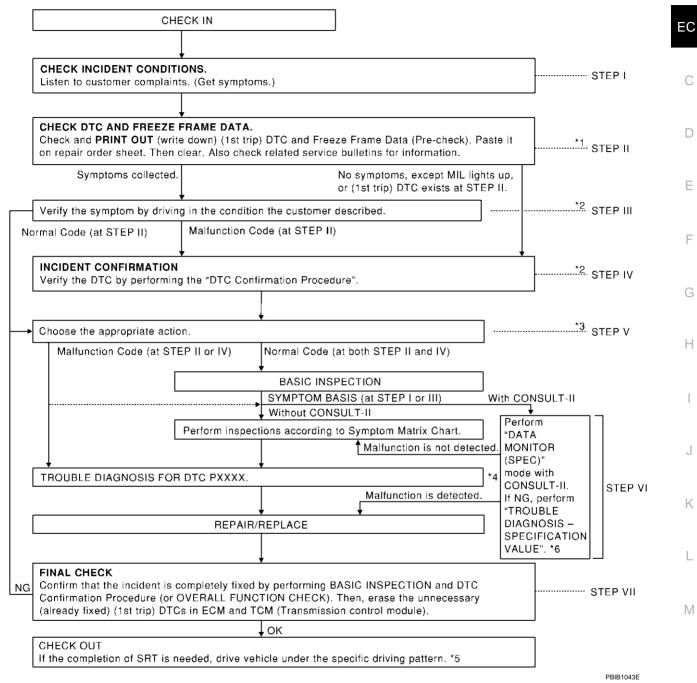
Before undertaking actual checks, take a few minutes to talk with a customer who approaches with a driveability complaint. The customer can supply good information about such incidents, especially intermittent ones. Find out what symptoms are present and under what conditions they occur. A "Diagnostic Worksheet" like the example on $\underline{\sf EC-83}$ should be used.

Start your diagnosis by looking for "conventional" malfunctions first. This will help troubleshoot driveability malfunctions on an electronically controlled engine vehicle.



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WORK FLOW Flow Chart



- *1 If time data of "SELF-DIAG RESULTS" is other than "0" or "[1t]", perform <u>EC-135</u>, "TROUBLE DIAG-NOSIS FOR INTERMITTENT INCI-DENT".
- *4 If malfunctioning part cannot be detected, perform <u>EC-135</u>, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".
- 2 If the incident cannot be verified, per- *3 form <u>EC-135</u>, "TROUBLE DIAGNO-SIS FOR INTERMITTENT INCIDENT".
- *5 <u>EC-67</u>

- If the on board diagnostic system cannot be performed, check main power supply and ground circuit.

 Refer to <u>EC-136</u>, "<u>POWER SUPPLY CIRCUIT FOR ECM</u>".
- *6 <u>EC-131</u>

STEP	DESCRIPTION
STEPI	Get detailed information about the conditions and the environment when the incident/symptom occurred using the "DIAGNOSTIC WORK SHEET", <u>EC-82</u> .
STEP II	Before confirming the concern, check and write down (print out using CONSULT-II or GST) the (1st trip) DTC and the (1st trip) freeze frame data, then erase the DTC and the data. (Refer to EC-69 .) The (1st trip) DTC and the (1st trip) freeze frame data can be used when duplicating the incident at STEP III & IV. If the incident cannot be verified, perform EC-135 . "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT". Study the relationship between the cause, specified by (1st trip) DTC, and the symptom described by the customer. (The "Symptom Matrix Chart" will be useful. See EC-91 .) Also check related service bulletins for information.
STEP III	Try to confirm the symptom and under what conditions the incident occurs. The "DIAGNOSTIC WORK SHEET" and the freeze frame data are useful to verify the incident. Connect CONSULT-II to the vehicle in DATA MONITOR (AUTO TRIG) mode and check real time diagnosis results. If the incident cannot be verified, perform EC-135 , "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT". If the malfunction code is detected, skip STEP IV and perform STEP V.
STEP IV	Try to detect the (1st trip) DTC by driving in (or performing) the "DTC Confirmation Procedure". Check and read the (1st trip) DTC and (1st trip) freeze frame data by using CONSULT-II or GST. During the (1st trip) DTC verification, be sure to connect CONSULT-II to the vehicle in DATA MONITOR (AUTO TRIG) mode and check real time diagnosis results. If the incident cannot be verified, perform EC-135 , "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT". In case the "DTC Confirmation Procedure" is not available, perform the "Overall Function Check" instead. The (1st trip) DTC cannot be displayed by this check, however, this simplified "check" is an effective alternative. The "NG" result of the "Overall Function Check" is the same as the (1st trip) DTC detection.
STEP V	Take the appropriate action based on the results of STEP I through IV. If the malfunction code is indicated, proceed to TROUBLE DIAGNOSIS FOR DTC PXXXX. If the normal code is indicated, proceed to the BASIC INSPECTION. (Refer to EC-86 .) Then perform inspections according to the Symptom Matrix Chart. (Refer to EC-91 .)
STEP VI	Identify where to begin diagnosis based on the relationship study between symptom and possible causes. Inspect the system for mechanical binding, loose connectors or wiring damage using (tracing) "Harness Layouts". Gently shake the related connectors, components or wiring harness with CONSULT-II set in "DATA MONITOR (AUTO TRIG)" mode. Check the voltage of the related ECM terminals or monitor the output data from the related sensors with CONSULT-II. Refer to EC-103, EC-125. The "Diagnostic Procedure" in EC section contains a description based on open circuit inspection. A short circuit inspection is also required for the circuit check in the Diagnostic Procedure. For details, refer to "Circuit Inspection" in GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident". Repair or replace the malfunction parts. If malfunctioning part cannot be detected, perform EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".
STEP VII	Once you have repaired the circuit or replaced a component, you need to run the engine in the same conditions and circumstances which resulted in the customer's initial complaint. Perform the "DTC Confirmation Procedure" and confirm the normal code [DTC No. P0000] is detected. If the incident is still detected in the final check, perform STEP VI by using a method different from the previous one. Before returning the vehicle to the customer, be sure to erase the unnecessary (already fixed) (1st trip) DTC in ECM and TCM (Transmission control module). (Refer to EC-69, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" and AT-40, "HOW TO ERASE DTC".)

DIAGNOSTIC WORKSHEET 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 a incident. It is important to fully understand the symptoms or conditions for a customer complaint.

Utilize a diagnostic worksheet like the one on the next page 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.

KEY POINTS

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

SEF907L

[TYPE 1]

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Fuel filler cap was left off or incorrectly screwed on, allowing fuel to evaporate into the atmosphere.

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	y screwed on.								
	☐ Startability	☐ Impossible to start ☐ No combust ☐ 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 ☐ F☐ Others [High idle								
- 3p	☐ 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 decelerating ☐ Ust after stopping ☐ While loading									
Incident occu	rrence	☐ Just after delivery ☐ Recently ☐ In the morning ☐ At night ☐ In the daytime									
Frequency		☐ All the time ☐ Under certain conditions ☐ Sometimes									
Weather cond	litions	☐ 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 speed	4,000 6,000 8,000 rpm								
Road condition	ns	☐ In town ☐ In suburbs ☐ Hig	hway 🔲 Off road (up/down)								
Driving condit	ions	Not affected At starting While idling At racing While accelerating While cruising While decelerating While turning (RH/LH) Vehicle speed									
Malfunction in	ndicator lamp	0 10 20 ☐ Turned on ☐ Not turned on	30 40 50 60 MPH								

MTBL0017

DTC Inspection Priority Chart

ABS0003W

If some DTCs are displayed at the same time, perform inspections one by one based on the following priority chart.

NOTE:

If DTC U1000 and/or U1001 is displayed with other DTC, first perform the trouble diagnosis for DTC U1000, U1001. Refer to $\underline{\text{EC-142}}$.

	[TYPE 1
Priority	Detected items (DTC)
1	U1000 U1001 CAN communication line
	• P0101 P0102 P0103 P1102 Mass air flow sensor
	P0112 P0113 P0127 Intake air temperature sensor
	P0117 P0118 P0125 Engine coolant temperature sensor
	P0128 Thermostat function
	• P0121 P0122 P0123 P0221 P0222 P0223 P1223 P1224 P1225 P1226 P1229 Throttle position sensor
	P0226 P0227 P0228 P1227 P1228 Accelerator pedal position sensor
	P0181 P0182 P0183 Fuel tank temperature sensor
	P0327 P0328 Knock sensor
	P0335 Crankshaft position sensor (POS)
	P0340 P0345 Camshaft position sensor (PHASE)
	P0460 P0461 P0462 P0463 P1464 Fuel level sensor
	P0500 Vehicle speed sensor
	● P0605 ECM
	P0705 Park/Neutral position (PNP) switch
	• P1610 - P1615 NATS
	P1706 Park/Neutral position (PNP) switch
2	P0031P0032 P0051 P0052 Heated oxygen sensor 1 heater
	 P0037 P0038 P0057 P0058 Heated oxygen sensor 2 heater
	 P0132 P0133 P0134 P0152 P0153 P0154 P1143 P1144 P1163 P1164 Heated oxygen sensor 1
	• P0138 P0139 P0158 P0159 P1146 P1147 P1166 P1167 Heated oxygen sensor 2
	P0441 EVAP control system purge flow monitoring
	P0444 P0445 P1444 EVAP canister purge volume control solenoid valve
	P0447 P1446 EVAP canister vent control valve
	P0451* P0452 P0453 EVAP control system pressure sensor
	P0550 Power steering pressure sensor
	● P0650 MIL
	 P0710 P0720 P0725 P0740 P0744 P0745 P1705 P1716 P1730 P1752 P1754 P1757 P1759 P1762 P1764 P1767 P1769 P1772 P1774 A/T related sensors, solenoid valves and switches
	P1065 ECM power supply
	P1122 Electric throttle control function
	P1124 P1126 P1128 Electric throttle control actuator
	P1217 Engine over temperature (OVERHEAT)
	P1805 Brake switch
3	P0011 P0021 Intake valve timing control
Ü	P0171 P0172 P0174 P0175 Fuel injection system function
	• P0300 - P0306 Misfire
	P0420 P0430 Three way catalyst function
	P0442 P0455 P0456 EVAP control system
	P0506 P0507 Idle speed control system
	P1121 Electric throttle control actuator
	P1148 P1168 Closed loop control
	P1211 ABS/TCS control unit P1212 ABS/TCS communication line
	P1564 ASCD steering switch P1573 ASCD broke switch
	P1572 ASCD brake switch P1574 ASCD vahials around account.
	P1574 ASCD vehicle speed sensor

^{*:} This DTC is applicable to vehicle with serial No. of 303268 and after.

[TYPE 1]

Fail-safe Chart

When the DTC listed below is detected, the ECM enters fail-safe mode and the MIL lights up.

DTC No.	Detected items	Engine opera	ting condition in fail-safe mode						
P0102 P0103 P1102	Mass air flow sensor circuit	Engine speed will not rise more than	n 2,400 rpm due to the fuel cut.						
P0117 P0118	Engine coolant tempera- ture sensor circuit	ignition switch "ON" or "START".	determined by ECM based on the time after turning olant temperature decided by ECM.						
		Condition	Engine coolant temperature decided (CONSULT-II display)						
		Just as ignition switch is turned ON or Start	40°C (104°F)						
		More than approx. 4 minutes after ignition ON or Start	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 co fan operates while engine is running.								
P0221 P0222 P0223 P1223 P1224	Throttle position sensor	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 norm condition. So, the acceleration will be poor.							
P0226 P0227 P0228 P1227 P1228	Accelerator pedal position sensor								
P1121	Electric throttle control actuator	malfunction:)	tor does not function properly due to the return spring stuator by regulating the throttle opening around the not rise more than 2,000 rpm.						
			in fail-safe mode is not in specified range:) ntrol actuator by regulating the throttle opening to 20						
		the engine stalls.	ve is stuck open:) down gradually by fuel cut. After the vehicle stops, sition, and engine speed will not exceed 1,000 rpm or						
P1122	Electric throttle control function	ECM stops the electric throttle contributed opening (approx. 5 degrees) b	rol actuator control, throttle valve is maintained at a by the return spring.						
P1124 P1126	Throttle control motor relay	ECM stops the electric throttle contributed opening (approx. 5 degrees) b	rol actuator control, throttle valve is maintained at a y the return spring.						
P1128	Throttle control motor	ECM stops the electric throttle contributed opening (approx. 5 degrees) b	rol actuator control, throttle valve is maintained at a y the return spring.						
P1229	Sensor power supply	ECM stops the electric throttle contributed opening (approx. 5 degrees) b	rol actuator control, throttle valve is maintained at a y the return spring.						

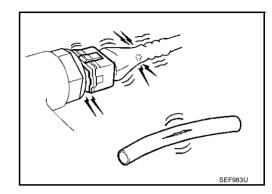
EC-85 2003 G35 Sedan Revision; 2004 April

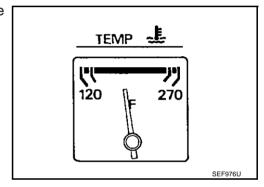
Basic Inspection

1. INSPECTION START

BS0003Y

- 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 leaks
- Air cleaner clogging
- Gasket
- 3. Confirm 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 the middle of gauge. Ensure engine stays below 1,000 rpm.

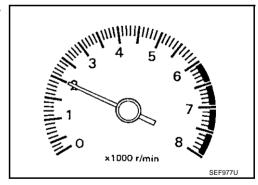




- 5. Run engine at about 2,000 rpm for about 2 minutes under no-
- 6. Make sure that no DTC is displayed with CONSULT-II or GST.

OK or NG

OK >> GO TO 3. NG >> GO TO 2.



2. REPAIR OR REPLACE

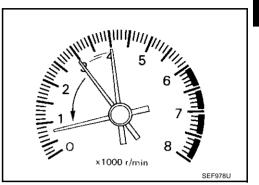
Repair or replace components as necessary according to corresponding "Diagnostic Procedure".

>> GO TO 3.

$\overline{3}$. CHECK TARGET IDLE SPEED

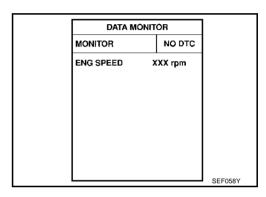
(II) With CONSULT-II

- Run engine at about 2,000 rpm for about 2 minutes under no-load.
- 2. Rev engine (2,000 to 3,000 rpm) two or three times under noload, then run engine at idle speed for about 1 minute.



3. Read idle speed in "DATA MONITOR" mode with CONSULT-II.

650 ± 50 rpm (in "P" or "N" position)



Without CONSULT-II

- Run engine at about 2,000 rpm for about 2 minutes under no-load.
- Rev engine (2,000 to 3,000 rpm) two or three times under no-load, then run engine at idle speed for about 1 minute.
- Check idle speed. 3.

650 \pm 50 rpm (in "P" or "N" position)

OK or NG

OK >> GO TO 10. NG >> GO TO 4.

4. PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING

- Stop engine. 1.
- Perform EC-51, "Accelerator Pedal Released Position Learning".

>> GO TO 5.

$5.\,$ PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Perform EC-51, "Throttle Valve Closed Position Learning".

>> GO TO 6.

EC-87 2003 G35 Sedan Revision; 2004 April

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6. PERFORM IDLE AIR VOLUME LEARNING

Refer to EC-51, "Idle Air Volume Learning".

Is Idle Air Volume Learning carried out successfully?

YES or NO

YES >> GO TO 7.

NO >> 1. Follow the instruction of "Idle Air Volume Learning".

2. GO TO 4.

7. CHECK TARGET IDLE SPEED AGAIN

(P) With CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- 2. Read idle speed in "DATA MONITOR" mode with CONSULT-II.

(R) Without CONSULT-II

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

```
650 \pm 50 rpm (in "P" or "N" position)
```

OK or NG

OK >> GO TO 10. NG >> GO TO 8.

8. DETECT MALFUNCTIONING PART

Check the following.

- Check camshaft position sensor (PHASE) and circuit. Refer to <u>EC-334</u>.
- Check crankshaft position sensor (POS) and circuit. Refer to <u>EC-327</u>.

OK or NG

OK >> GO TO 9.

NG >> 1. Repair or replace.

2. GO TO 4.

9. CHECK ECM FUNCTION

- 1. Substitute another known-good ECM to check ECM function. (ECM may be the cause of a incident, but this is the rarely the case.)
- 2. Perform initialization of IVIS (NATS) system and registration of IVIS (NATS) ignition key IDs. Refer to EC- 71, "IVIS (Infiniti Vehicle Immobilizer System NATS)".

>> GO TO 4.

10. CHECK IGNITION TIMING

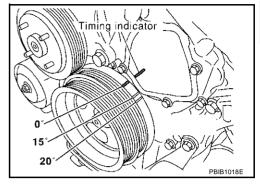
- 1. Run engine at idle.
- 2. Check ignition timing with a timing light.

 $15 \pm 5^{\circ}$ BTDC (in "P" or "N" position)

OK or NG

OK >> INSPECTION END

NG >> GO TO 11.



11. PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING

- 1. Stop engine.
- 2. Perform EC-51, "Accelerator Pedal Released Position Learning".

>> GO TO 12.

12. PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Perform EC-51, "Throttle Valve Closed Position Learning".

>> GO TO 13.

13. PERFORM IDLE AIR VOLUME LEARNING

Refer to EC-51, "Idle Air Volume Learning".

Is Idle Air Volume Learning carried out successfully?

YES or NO

YES >> GO TO 14.

NO >> 1. Follow the instruction of "Idle Air Volume Learning".

2. GO TO 4.

14. CHECK TARGET IDLE SPEED AGAIN

(P) With CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- Read idle speed in "DATA MONITOR" mode with CONSULT-II.

650 ± 50 rpm (in "P" or "N" position)

(R) Without CONSULT-II

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

650 \pm 50 rpm (in "P" or "N" position)

OK or NG

OK >> GO TO 15. NG >> GO TO 17.

EC-89 2003 G35 Sedan Revision; 2004 April

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15. CHECK IGNITION TIMING AGAIN

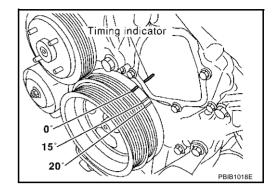
- 1. Run engine at idle.
- 2. Check ignition timing with a timing light.

15
$$\pm$$
 5° BTDC (in "P" or "N" position)

OK or NG

OK >> INSPECTION END

NG >> GO TO 16.



16. CHECK TIMING CHAIN INSTALLATION

Check timing chain installation. Refer to EM-54, "TIMING CHAIN" .

OK or NG

OK >> GO TO 17.

NG >> 1. Repair the timing chain installation.

2. GO TO 4.

17. DETECT MALFUNCTIONING PART

Check the following.

- Check camshaft position sensor (PHASE) and circuit. Refer to EC-334.
- Check crankshaft position sensor (POS) and circuit. Refer to EC-327.

OK or NG

OK >> GO TO 18.

NG >> 1. Repair or replace.

2. GO TO 4.

18. CHECK ECM FUNCTION

- 1. Substitute another known-good ECM to check ECM function. (ECM may be the cause of a incident, but this is the rarely the case.)
- 2. Perform initialization of IVIS (NATS) system and registration of IVIS (NATS) ignition key IDs. Refer to EC- 71, "IVIS (Infiniti Vehicle Immobilizer System NATS)".

>> GO TO 4.

[TYPE 1]

Symptom Matrix Chart
SYSTEM — BASIC ENGINE CONTROL SYSTEM

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							S'	YMPT	OM							
		START/RESTART (EXCP. HA)		HESITATION/SURGING/FLAT SPOT	SPARK KNOCK/DETONATION	POWER/POOR ACCELERATION	N IDLE	HUNTING	NOI	URN TO IDLE	OVERHEATS/WATER TEMPERATURE HIGH	EXCESSIVE FUEL CONSUMPTION	OIL CONSUMPTION	BATTERY DEAD (UNDER CHARGE)	Reference page	C
		HARD/NO STA	ENGINE STALL	HESITATION/S	SPARK KNOCK	LACK OF POW	HIGH IDLE/LOW IDLE	ROUGH IDLE/HUNTING	IDLING VIBRATION	SLOW/NO RETURN TO IDLE	OVERHEATS/N	EXCESSIVE FI	EXCESSIVE O	BATTERY DEA		E
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-611	G
	Fuel pressure regulator system	3	3	4	4	4	4	4	4	4		4			EC-53	
	Injector circuit	1	1	2	3	2		2	2			2			EC-601	
	Evaporative emission system	3	3	4	4	4	4	4	4	4		4			EC-635	-
Air	Positive crankcase ventilation system	3	3	4	4	4	4	4	4	4		4	1		EC-648	
	Incorrect idle speed adjustment						1	1	1	1		1			EC-40	I
	Electric throttle control actuator	1	1	2	3	3	2	2	2	2		2		2	EC-451, EC-453	
Ignition	Incorrect ignition timing adjustment	3	3	1	1	1		1	1			1			EC-40	J
	Ignition circuit	1	1	2	2	2		2	2			2			EC-589	
Main po	wer supply and ground circuit	2	2	3	3	3		3	3		2	3			EC-136	K
Mass air	r flow sensor circuit	1			2										EC-178, EC-445	1
Engine	coolant temperature sensor circuit						3			3					EC-190	
Heated	oxygen sensor 1 circuit		1	2	3	2		2	2			2			EC-212, EC-221, EC-234, EC-470, EC-476	IV
Throttle	position sensor circuit						2			2					EC-290	
	ator pedal position sensor circuit			3	2	1									EC-304	
	ensor circuit			2								3			EC-323	
	naft position sensor (POS) circuit	2	2												EC-327	
	aft position sensor (PHASE) circuit	3	2									_			EC-334	
	speed signal circuit		2	3		3						3			EC-423	
Power s	teering pressure sensor circuit		2					3	3						EC-429	
ECM		2	2	3	3	3	3	3	3	3	3	3			EC-434, EC-441	
cuit	alve timing control solenoid valve cir- itch circuit		3	2		1	3	2	2	3		3			EC-145	
	stab aircuit	1		3		3		3	3			3			EC-578	

						S`	/MPT	OM		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-617								
Electrical load signal circuit							3							EC-622								
Air conditioner circuit	2	2	3	3	3	3	3	3	3		3		2	ATC-42								
VDC/TCS/ABS control unit			4											BRC-13								

^{1 - 6:} The numbers refer to the order of inspection. (continued on next page)

SYSTEM — ENGINE MECHANICAL & OTHER

							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	
Fuel	Fuel tank	- 5													FL-12
	Fuel piping	3		5	5	5		5	5			5			EM-37
	Vapor lock		5												_
	Valve deposit														_
	Poor fuel (Heavy weight gasoline, Low octane)	5		5	5	5		5	5			5			_

[TYPE 1]

															[TYPE 1]	
							S'	/MPT	ОМ							
		(EXCP. HA)		T SPOT	N	ACCELERATION				111	ERATURE HIGH	4PTION	NOIL	HARGE)		EC
		START/RESTART	1	HESITATION/SURGING/FLAT	SPARK KNOCK/DETONATION	POWER/POOR AC	OW IDLE	/HUNTING	ATION	SLOW/NO RETURN TO IDLE	OVERHEATS/WATER TEMPERATURE	EXCESSIVE FUEL CONSUMPTION	OIL CONSUMPTION	BATTERY DEAD (UNDER CHARGE)	Reference page	C
		HARD/NO ST	ENGINE STALL	HESITATION	SPARK KNO	LACK OF PO	HIGH IDLE/LOW IDLE	ROUGH IDLE/HUNTING	IDLING VIBRATION	SLOW/NO RI	OVERHEATS	EXCESSIVE	EXCESSIVE	BATTERY DE		Е
Warranty s	ymptom code	AA	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	НА		_
Air	Air duct														<u>EM-16</u>	F
	Air cleaner														<u>EM-16</u>	
	Air leakage from air duct (Mass air flow sensor — electric throttle control actuator)	5	5	5	5	5	5	5	5	5		5			<u>EM-16</u>	G
	Electric throttle control actuator	5			5		5			5					<u>EM-18</u>	Н
	Air leakage from intake manifold/ Collector/Gasket														EM-18, EM-22	
Cranking	Battery	1	1	1		1		1	1					1	<u>SC-4</u>	
	Generator circuit						-								SC-21	
	Starter circuit Signal plate	6										1			SC-9	ı
	PNP switch	4	-												EM-103 AT-110	0
Engine	Cylinder head	-													AI-IIU	
Liigiile	Cylinder head gasket	5	5	5	5	5		5	5		4	5	3		<u>EM-87</u>	K
	Cylinder block										'					
	Piston												4			L
	Piston ring															_
	Connecting rod	6	6	6	6	6		6	6			6		1	<u>EM-103</u>	
	Bearing															M
	Crankshaft															
Valve	Timing chain														EM-54	
mecha- nism	Camshaft														EM-71	
	Intake valve timing control	5	5	5	5	5		5	5			5			<u>EM-54</u>	
	Intake valve												3		EM-87	
	Exhaust valve												3		<u>LIVI-O7</u>	
Exhaust	Exhaust manifold/Tube/Muffler/ Gasket	5	5	5	5	5		5	5			5			<u>EM-24</u> , <u>EX-</u> <u>3</u>	
Lade 1	Three way catalyst														EM 00 111	
Lubrica- tion	Oil pan/Oil strainer/Oil pump/Oil filter/Oil gallery/Oil cooler	5	5	5	5	5		5	5			5			EM-28, LU- 13 , LU-9 , LU-10	
	Oil level (Low)/Filthy oil														LU-6	

							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	АН	AJ	AK	AL	AM	НА	
Cooling	Radiator/Hose/Radiator filler cap														<u>CO-14,</u> <u>CO-18</u>
	Thermostat	1								5					<u>CO-30</u>
	Water pump	5	5	5	5	5		5	5		4	5			<u>CO-26</u>
	Water gallery	Ī													<u>CO-32</u>
	Coolant level (Low)/Contami- nated coolant									5					<u>CO-11</u>
IVIS (Infin NATS)	iti Vehicle Immobilizer System —	1	1												EC-71 or BL-125

^{1 - 6:} The numbers refer to the order of inspection.

Engine Control Component Parts Location

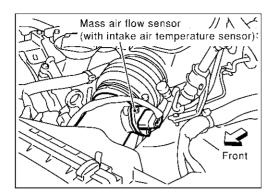
EC Electric throttle control actuator Engine coolant temperature sensor Camshaft position sensor (PHASE) (Bank 2) Camshaft position sensor EVAP canister purge (PHASE) (Bank 1) D volume control Ignition coil solenoid valve (with power transister) EVAP service port and spark plug (Bank 2) Knock sensor F 0 M Injector (Bank 1) Mass air flow sensor Ignition coil (with power (with intake air temperature sensor) transister) and spark Injector (Bank 2) plug (Bank 1) Intake valve timing control solenoid valve (Bank 2) Intake valve timing control Refrigerant pressure sensor

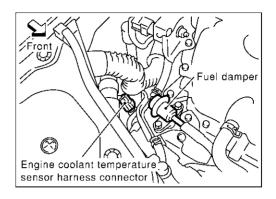
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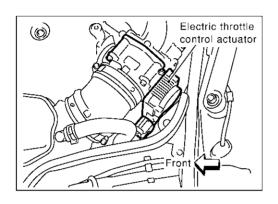
Cooling fan motor

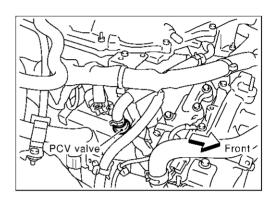
solenoid valve (Bank 1)

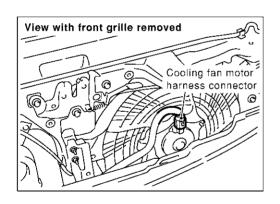
Power steering pressure sensor

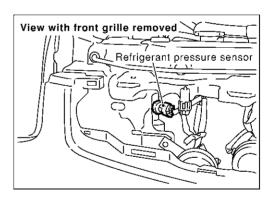


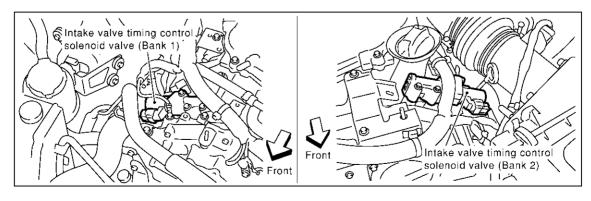




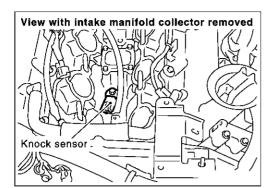


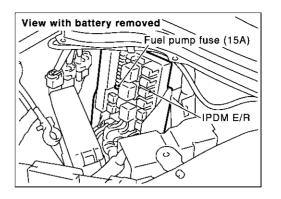


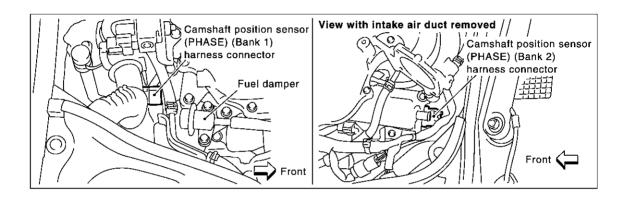


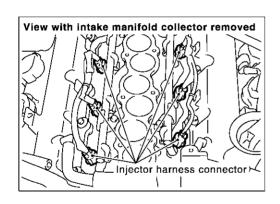


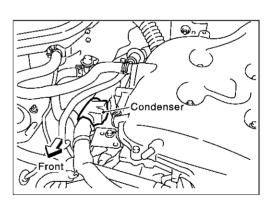
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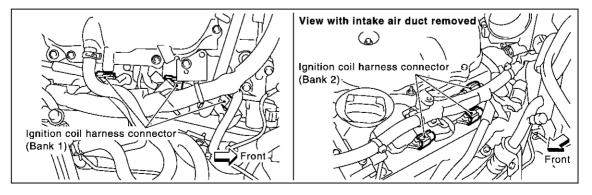












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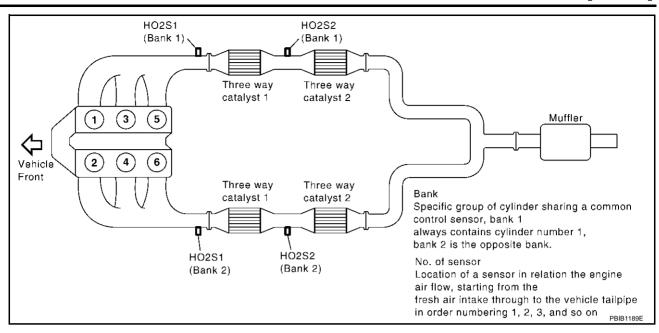
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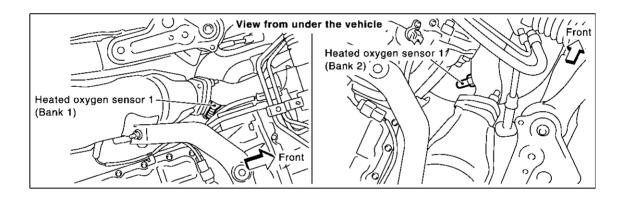
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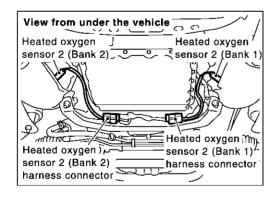
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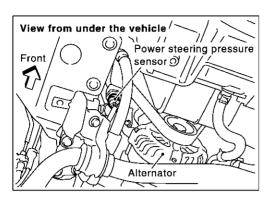
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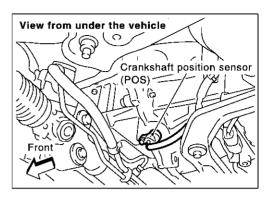
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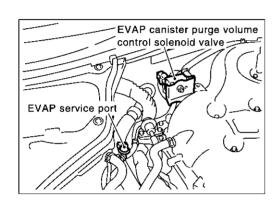
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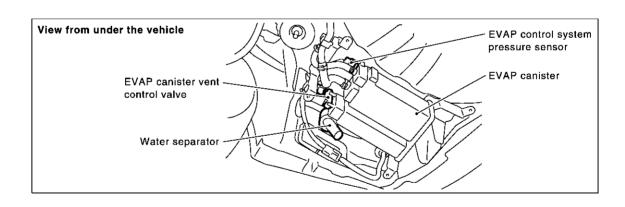
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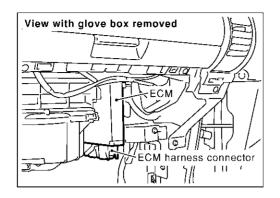


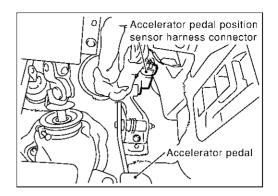


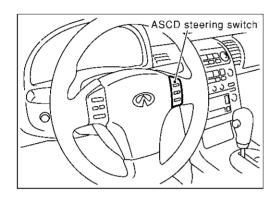


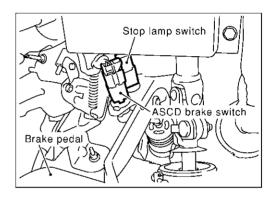


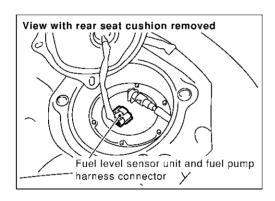
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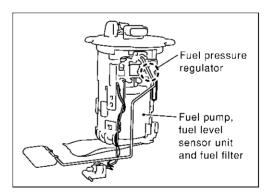


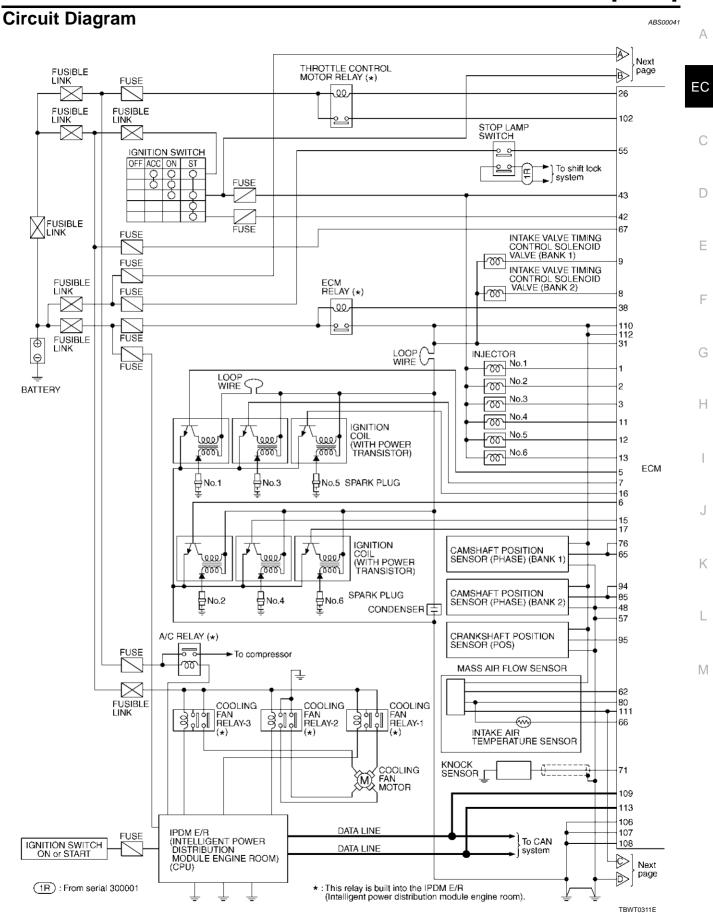


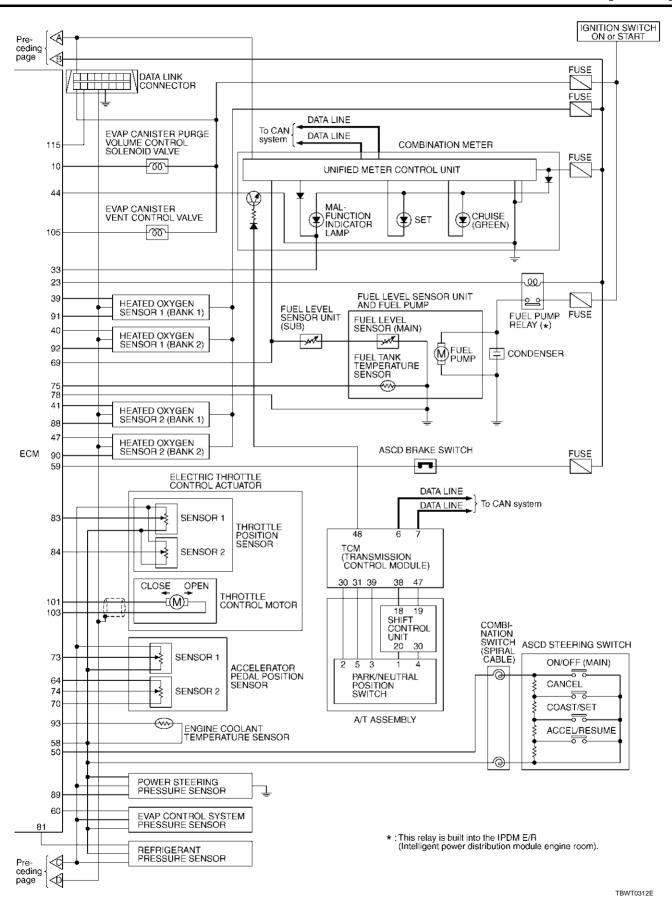












[TYPE 1]

ECM Harness Connector Terminal Layout

ABS00042

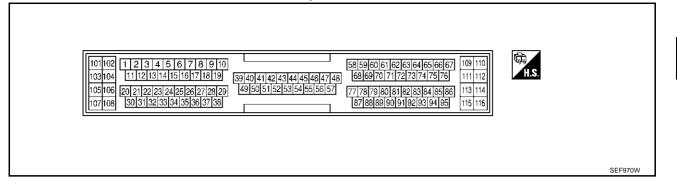
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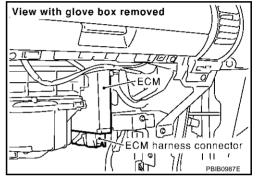
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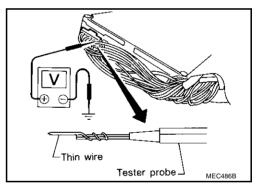
ECM Terminals and Reference Value PREPARATION

ABS00043

- 1. ECM is located behind the glove box. For this inspection, remove glove box.
- 2. Remove ECM harness protector.



- 3. Perform all voltage measurements with the connector connected. Extend tester probe as shown to perform tests easily.
 - Open harness securing clip to make testing easier.
 - Use extreme care not to touch 2 pins at one time.
 - Data is for comparison and may not be exact.



ECM INSPECTION TABLE

Specification data are reference values and are measured between each terminal and ground. Pulse signal is measured by CONSULT-II.

CALITION

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECMs transistor. Use a ground other than ECM terminals, such as the ground.

Revision; 2004 April EC-103 2003 G35 Sedan

				[, ,, _ ,]
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
1 2 3	R/B R/W R/Y R/L W P	Injector No. 1 Injector No. 2 Injector No. 3 Injector No. 4 Injector No. 5 Injector No. 6	[Engine is running]Warm-up conditionIdle speed	BATTERY VOLTAGE (11 - 14V)★ Indicate the state of the
11 12 13			[Engine is running] ■ Warm-up condition ■ Engine speed is 2,000 rpm.	BATTERY VOLTAGE (11 - 14V)★ Interpretation of the state of the stat
5 6 7	Y/R G/R L/R GY PU/W GY/R	Ignition signal No. 1 Ignition signal No. 2 Ignition signal No. 3 Ignition signal No. 4 Ignition signal No. 5 Ignition signal No. 6	[Engine is running] ■ Warm-up condition ■ Idle speed	0 - 0.2V★
15 16 17			[Engine is running]Warm-up conditionEngine speed is 2,500 rpm.	0.1 - 0.3V★
8	W/G	Intake valve timing control solenoid valve (bank 2)	[Engine is running]Warm-up conditionIdle speed	BATTERY VOLTAGE (11 - 14V)
			 [Engine is running] Warm-up condition When revving engine up to 2,000 rpm quickly 	7 - 12V*

[TYPE 1]

				[IYPE 1]	
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)	А
9 \		Intake valve timing control solenoid valve (bank 1)	[Engine is running] • Warm-up condition • Idle speed	BATTERY VOLTAGE (11 - 14V)	EC
	W/R		 [Engine is running] Warm-up condition When revving engine up to 2,000 rpm quickly 	7 - 12V★	D
		EVAP canister purge volume control solenoid valve	[Engine is running] ● Idle speed	BATTERY VOLTAGE (11 - 14V)★	E
				100 V/Div 50 ms/Div SEC990C	G
10	L/Y			BATTERY VOLTAGE	Н
			 [Engine is running] ● Engine speed is about 2,000 rpm (More than 100 seconds after starting engine). 	(11 - 14V)★ 10.0 V/Div 50 ms/Div r SEC991C	J
			[Ignition switch "ON"]		
		Fuel pump relay	 For 1 second after turning ignition switch "ON" 	0 - 1.5V	K
23	B/OR		[Engine is running]		
			[Ignition switch "ON"]More than 1 second after turning ignition switch "ON".	BATTERY VOLTAGE (11 - 14V)	L
26	C	Throttle control motor relay	[Ignition switch "OFF"]	BATTERY VOLTAGE (11 - 14V)	N
26 G	G		[Ignition switch "ON"]	0 - 1.0V	
31	W/L	Counter current return	[Ignition switch "ON"]	BATTERY VOLTAGE (11 - 14V)	
			[Ignition switch "ON"]	0 - 1.0V	
33	R/B	MIL	[Engine is running] • Idle speed	BATTERY VOLTAGE (11 - 14V)	
38	W/R	W/B ECM relay (Self shut-off)	[Engine is running] [Ignition switch "OFF"] • For a few seconds after turning ignition switch "OFF"	0 - 1.5V	
			[Ignition switch "OFF"] • A few seconds passed after turning ignition switch "OFF"	BATTERY VOLTAGE (11 - 14V)	

				[ITPE 1]
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
39	L	Heated oxygen sensor 1 heater (bank 1)	 [Engine is running] Warm-up condition Engine speed is below 3,600 rpm. 	Approximately 7V★ → 10.0 V/Div 50 ms/Div 1 PBIB0519E
			[Engine is running] ● Engine speed is above 3,600 rpm.	BATTERY VOLTAGE (11 - 14V)
40	Υ	Heated oxygen sensor 1 heater (bank 2)	[Engine is running]Warm-up conditionEngine speed is below 3,600 rpm.	Approximately 7V★
			[Engine is running] • Engine speed is above 3,600 rpm.	BATTERY VOLTAGE (11 - 14V)
41	P/B	Heated oxygen sensor 2 heater (bank 1)	 [Engine is running] Engine speed is 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. 	0 - 1.0V
			 [Ignition switch "ON"] ◆ Engine stopped [Engine is running] ◆ Engine speed is above 3,600 rpm. 	BATTERY VOLTAGE (11 - 14V)
42	SB	Start signal	[Ignition switch "ON"]	Approximately 0V
			[Ignition switch "START"]	9 - 12V
43	W/L	Ignition switch	[Ignition switch "OFF"]	0V BATTERY VOLTAGE (11 - 14V)
44	G/OR	DR PNP switch	[Ignition switch "ON"] ● Gear position is "P" or "N".	Approximately 0V
		G/OIX THE SWILLII	Ownor	[Ignition switch "ON"] • Except the above gear position

[TYPE 1]

TES			I	[TYPE 1]
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
47		Heated oxygen sensor 2 heater (bank 2)	[Engine is running] • Engine speed is below 3,600 rpm after the	
			following conditions are met. - Engine: after warming up	0 - 1.0V
	R/L		 Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load. 	
			[Ignition switch "ON"]	
			Engine stopped	BATTERY VOLTAGE
			[Engine is running]	(11 - 14V)
			• Engine speed is above 3,600 rpm.	
48	В	ECM ground	[Engine is running]	Engine ground
57	В		Idle speed	Engino ground
			[Ignition switch "ON"]	Approximately 4.0V
			 ASCD steering switch is released. 	Approximately 4.0V
			[Ignition switch "ON"]	Approximately (1)/
		G/Y ASCD steering switch	CRUISE switch is pressed.	Approximately 0V
	0.04		[Ignition switch "ON"]	
50	G/Y		CANCEL switch is pressed.	Approximately 1V
			[Ignition switch "ON"]	
			COAST/SET switch is pressed.	Approximately 2V
			[Ignition switch "ON"]	
			ACCEL/RESUME switch is pressed.	Approximately 3V
	P/L	L Stop lamp switch	[Ignition switch "ON"]	
			Brake pedal is fully released	Approximately 0V
55			[Ignition switch "ON"]	BATTERY VOLTAGE
			Brake pedal is depressed	(11 - 14V)
				(,
58	B/W	Sensors' around	[Engine is running] • Warm-up condition	Approximately 0V
50		B/W Sensors' ground	Idle speed	πρριολιπαίσιγ σν
			'	
	SB	SB ASCD brake switch	[Ignition switch "ON"]	Approximately 0V
59			Brake pedal is depressed Comparison and the	
			[Ignition switch "ON"]	BATTERY VOLTAGE (11 - 14V)
			Brake pedal is fully released	(11 - 17V)
60	L/R	EVAP control system pressure sensor	[Ignition switch "ON"]	Approximately 1.8 - 4.8V
62		LG Mass air flow sensor	[Engine is running]	
	LG		Warm-up condition	1.1 - 1.5V
			Idle speed	
J <u>L</u>			[Engine is running]	
			Warm-up condition	1.7 - 2.4V
			• Engine speed is 2,500 rpm.	
64	G	Accelerator pedal position sensor 2 power supply	[Ignition switch "ON"]	Approximately 2.5V

				[IYPE 1]
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
65	G/W G/W		[Engine is running] • Warm-up condition • Idle speed	1.0 - 4.0 V★ 20 5.0 V/Div 20 ms/Div T PBIB1039E
76			[Engine is running] ● Engine speed is 2,000 rpm.	1.0 - 4.0 V★ 20 ms/Div 20 ms/Div PBIB1040E
66	Y/G	Intake air temperature sensor	[Engine is running]	Approximately 0 - 4.8V Output voltage varies with intake air temperature.
67	R/W	Power supply for ECM (Buck-up)	[Ignition switch "OFF"]	BATTERY VOLTAGE (11 - 14V)
69	W/B	Fuel level sensor	[Ignition switch "ON"]	Approximately 0 - 4.8V Output voltage varies with fuel level.
70	B/R	Accelerator pedal position sensor 2 ground	[Ignition switch "ON"]	Approximately 0V
71	W	Knock sensor	[Engine is running] ● Idle speed	Approximately 2.5V
73	BR	Accelerator pedal position sensor 1	[Ignition switch "ON"]● Engine stopped● Accelerator pedal fully released	0.41 - 0.72V
			[Ignition switch "ON"]● Engine stopped● Accelerator pedal fully depressed	More than 3.2V
74	LG/B	G/B Accelerator pedal position sensor 2	[Ignition switch "ON"]● Engine stopped● Accelerator pedal fully released	0.07 - 0.49V
			[Ignition switch "ON"]Engine stoppedAccelerator pedal fully depressed	More than 1.49V
75	PU/W	Fuel tank temperature sensor	[Engine is running]	Approximately 0 - 4.8V Output voltage varies with fuel tank temperature.
78	В	Fuel level sensor ground	[Engine is running] ● Idle speed	Approximately 0V
80	B/Y	Mass air flow sensor ground	[Engine is running]Warm-up conditionIdle speed	Approximately 0V

[TYPE 1]

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
81	OR	Refrigerant pressure sensor	 [Engine is running] Warm-up condition Both A/C switch and blower switch are "ON". (Compressor operates.) 	1.0 - 4.0V
83	W	Throttle position sensor 1	 [Ignition switch "ON"] ● Engine stopped ● Gear position: "D" ● Accelerator pedal fully released [Ignition switch "ON"] 	More than 0.36V
			 Engine stopped Gear position: "D" Accelerator pedal fully depressed 	Less than 4.75V
			 [Ignition switch "ON"] Engine stopped Gear position: "D" Accelerator pedal fully released 	Less than 4.75V
84	G	Throttle position sensor 2	[Ignition switch "ON"] • Engine stopped • Gear position: "D" • Accelerator pedal fully depressed	
85	Y	Camshaft position sensor	[Engine is running]Warm-up conditionIdle speed	1.0 - 4.0V★ >>> 5.0 V/Div 20 ms/Div 1 PBIB1039E
94	Υ	Camshaft position sensor (PHASE) (bank 2)	[Engine is running] ● Engine speed is 2,000 rpm.	1.0 - 4.0V★ 1.0 - 4.0V★ 20 ms/Div 20 ms/Div PBIB1040E
88	W/R	Heated oxygen sensor 2 (bank 1)	 [Engine is running] Warm-up condition Revving engine from idle to 3,000 rpm quickly after the following conditions are met. After keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load. 	0 - Approximately 1.0V
89	W/G	Power steering pressure	[Engine is running] ● Steering wheel is being turned.	0.5 - 4.5V
og W/G s		sensor	[Engine is running]Steering wheel is not being turned.	0.4 - 0.8V

				[ITPE I]
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
90	G/R	Heated oxygen sensor 2 (bank 2)	 [Engine is running] Warm-up condition Revving engine from idle to 3,000 rpm quickly after the following conditions are met. After keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load. 	0 - Approximately 1.0V
91	L/W	Heated oxygen sensor 1 (bank 1)	[Engine is running]Warm-up conditionEngine speed is 2,000 rpm.	0 - Approximately 1.0V (Periodically change)
92	GY	Heated oxygen sensor 1 (bank 2)	[Engine is running]Warm-up conditionEngine speed is 2,000 rpm.	0 - Approximately 1.0V (Periodically change)
93	Y/B	Engine coolant temperature sensor	[Engine is running]	Approximately 0 - 4.8V Output voltage varies with engine coolant temperature.
05	DD	[Engine is running] • Warm-up condition • Idle speed Crankshaft position sensor (POS) [Engine is running] • Engine speed is 2,000 rpm.	Warm-up condition	Approximately 1.6V★ ■ 5.0 V/Div 1 ms/Div T PBIB1041E
95	BR			Approximately 1.5V★ → 5.0 V/Div 1 ms/Div T PBIB1042E
101	Υ	Throttle control motor (Open)	 [Ignition switch "ON"] Engine stopped Shift lever: "D" Accelerator pedal is depressing 	0 - 14V★
102	W/R	Throttle control motor relay power supply	[Ignition switch "ON"]	BATTERY VOLTAGE (11 - 14V)
103	BR	Throttle control motor (Close)	 [Ignition switch "ON"] Engine stopped Shift lever: "D" Accelerator pedal is releasing 	0 - 14V★
105	GY/L	EVAP canister vent control valve	[Ignition switch "ON"]	BATTERY VOLTAGE (11 - 14V)

[TYPE 1]

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TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
106 108	B B	ECM ground	[Engine is running] • Idle speed	Engine ground
107	В	Throttle control motor ground	[Ignition switch "ON"]	Approximately 0V
109	L	CAN communication line	[Ignition switch "ON"]	Approximately 2.6 - 3.2V Output voltage varies with the communication status.
110 112	P P	Power supply for ECM	[Ignition switch "ON"]	BATTERY VOLTAGE (11 - 14V)
111	L	Sensors' power supply	[Ignition switch "ON"]	Approximately 5V
113	R	CAN communication line	[Ignition switch "ON"]	Approximately 1.7 - 2.3V Output voltage varies with the communication status.
115	PU	Data link connector	[Ignition switch "ON"] CONSULT-II or GST is disconnected.	Approximately 5V

^{★:} Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

CONSULT-II Function FUNCTION

ABS00044

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-II 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.		
Data monitor (SPEC)	Input/Output of the specification for Basic fuel schedule, AFM, A/F feedback control value and the other data monitor items can be read.		
CAN diagnostic support monitor	The results of transmit/receive diagnosis of CAN communication can be read.		
Active test	Diagnostic Test Mode in which CONSULT-II 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/result can be confirmed.		
Function test	This mode is used to inform customers when their vehicle condition requires periodic maintenance.		
ECM 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
- 1st trip freeze frame data
- System readiness test (SRT) codes
- Test values
- Others

ENGINE CONTROL COMPONENT PARTS/CONTROL SYSTEMS APPLICATION

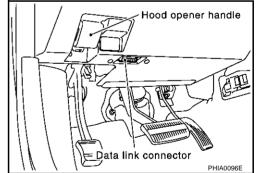
			DIAGNOSTIC TEST MODE								
	Item		WORK		AGNOSTIC SULTS	DATA	DATA	ACTIVE TEST	DTC & SRT CONFIRMATION		
			WORK SUP- PORT	DTC*1	FREEZE FRAME DATA*2	DATA MONI- TOR	MONI- TOR (SPEC)		SRT STATUS	DTC WORK SUP- PORT	
		Crankshaft position sensor (POS)		×	×	×	×				
		Camshaft position sensor (PHASE)		×		×	×				
		Mass air flow sensor		×		×	×				
		Engine coolant temperature sensor		×	×	×	×	×			
		Heated oxygen sensor 1		×		×	×		×	×	
		Heated oxygen sensor 2		×		×	×		×	×	
		Vehicle speed sensor		×	×	×	×				
		Accelerator pedal position sensor		×		×	×				
TS		Throttle position sensor		×		×	×				
PAR		Fuel tank temperature sensor		×		×	×	×			
NENT		EVAP control system pressure sensor		×		×	×				
PO		Intake air temperature sensor		×	×	×	×				
SO	INPUT	Knock sensor		×							
o F	Z	Refrigerant pressure sensor				×	×				
ATR		Ignition switch (start signal)				×	×				
ENGINE CONTROL COMPONENT PARTS		Closed throttle position switch (accelerator pedal position sensor signal)				×	×				
Ż		Air conditioner switch				×	×				
		Park/neutral position (PNP) switch		×		×	×				
		Stop lamp switch		×		×	×				
		Power steering pressure sensor		×		×	×				
		Battery voltage				×	×				
		Load signal				×	×				
		Fuel level sensor		×		×	×				
		ASCD steering switch		×		×	×				
		ASCD brake switch		×		×	×				

					DIAC	NOSTIC	TEST MOI	DE		
	Item		WORK	SELF-DIAGNOSTIC RESULTS			DATA		DTC & SRT CONFIRMATION	
			SUP- PORT	DTC*1	FREEZE FRAME DATA*2	DATA MONI- TOR	MONI- TOR (SPEC)	ACTIVE TEST	SRT STATUS	DTC WORK SUP- PORT
		Injectors				×	×	×		
		Power transistor (Ignition timing)				×	×	×		
PARTS		Throttle control motor relay		×		×	×			
		Throttle control motor		×						
ENGINE CONTROL COMPONENT		EVAP canister purge volume control solenoid valve		×		×	×	×		×
MP	5	Air conditioner relay				×	×			
8	OUTPUT	Fuel pump relay	×			×	×	×		
ROL	5	Cooling fan relay		×		×	×	×		
Ň		Heated oxygen sensor 1 heater		×		×	×		×	
S		Heated oxygen sensor 2 heater		×		×	×		×	
N N		EVAP canister vent control valve	×	×		×	×	×		
Ĕ		Intake valve timing control solenoid valve		×		×	×	×		
		Calculated load value			×	×	×			

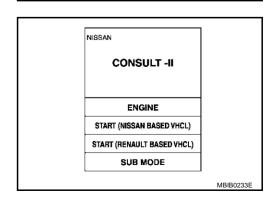
X: Applicable

INSPECTION PROCEDURE

- Turn ignition switch OFF.
- 2. Connect "CONSULT-II" and "CONSULT-II CONVERTER" to data link connector, which is located under LH dash panel near the hood opener handle.
- 3. Turn ignition switch ON.



4. Touch "START (NISSAN BASED VHCL)".



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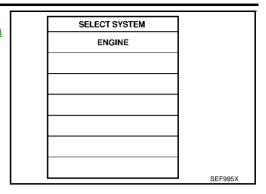
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^{*1:} This item includes 1st trip DTCs.

^{*2:} This mode includes 1st trip freeze frame data or freeze frame data. The items appear on CONSULT-II screen in freeze frame data mode only if a 1st trip DTC or DTC is detected. For details, refer to EC-61.

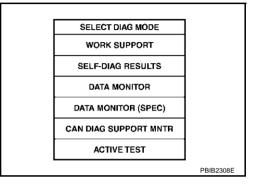
[TYPE 1]

 Touch "ENGINE".
 If "ENGINE" is not indicated, go to GI-38, "CONSULT-II Data Link Connector (DLC) Circuit".



6. Perform each diagnostic test mode according to each service procedure.

For further information, see the CONSULT-II Operation Manual.



WORK SUPPORT MODE

Work Item

WORK ITEM	CONDITION	USAGE
FUEL PRESSURE RELEASE	FUEL PUMP WILL STOP BY TOUCHING "START" DUR- ING 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 RATIO RETURNS TO THE ORIGINAL COEF- FICIENT.	When clearing the coefficient of self-learning control value
EVAP SYSTEM CLOSE	CLOSE THE EVAP CANISTER VENT CONTROL VALVE IN ORDER TO MAKE EVAP SYSTEM CLOSE UNDER THE FOLLOWING CONDITIONS. • IGN SW "ON"	When detecting EVAP vapor leak point of EVAP system
	ENGINE NOT RUNNING	
	• AMBIENT TEMPERATURE IS ABOVE 0°C (32°F).	
	NO VACUUM AND NO HIGH PRESSURE IN EVAP SYSTEM	
	• FUEL TANK TEMP. 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- II WILL DISCONTINUE IT AND DISPLAY APPROPRI- ATE INSTRUCTION.	
	NOTE: WHEN STARTING ENGINE, CONSULT-II MAY DISPLAY "BATTERY VOLTAGE IS LOW. CHARGE BATTERY", EVEN IN USING CHARGED BATTERY.	

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WORK ITEM	CONDITION	USAGE
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-16, "INDEX FOR DTC".)

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, it is displayed as "PXXXX". (Refer to EC-16 , "INDEX FOR DTC".)
FUEL SYS-B1	"Fuel injection system status" at the moment a malfunction is detected is displayed.
FUEL SYS-B2	One mode in the following is displayed. "Mode2": Open loop due to detected system malfunction "Mode3": Open loop due to driving conditions (power enrichment, deceleration enrichment) "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.
S-FUEL TRIM-B1 [%]	"Short-term fuel trim" at the moment a malfunction is detected is displayed.
S-FUEL TRIM-B2 [%]	The short-term fuel trim indicates dynamic or instantaneous feedback compensation to the base fuel schedule.
L-FUEL TRIM-B1 [%]	"Long-term fuel trim" at the moment a malfunction is detected is displayed.
L-FUEL TRIM-B2 [%]	The long-term fuel trim indicates much more gradual feedback compensation to the base fuel schedule than short-term fuel trim.
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.
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.

^{*:} This item is the same as that of 1st trip freeze frame data.

DATA MONITOR MODE Monitored Item

×: Applicable

Monitored item [Unit]	ECM INPUT SIG- NALS	MAIN SIG- NALS	Description	Remarks
ENG SPEED [rpm]	×	×	Indicates the engine speed computed from the signal of the crankshaft position sensor (POS) and camshaft position sensor (PHASE).	 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 [V]	×	×	The signal voltage of the mass air flow sensor is displayed.	When the engine is stopped, a certain value is indicated.

				[ITPE I]
Monitored item [Unit]	ECM INPUT SIG- NALS	MAIN SIG- NALS	Description	Remarks
B/FUEL SCHDL [msec]		×	"Base fuel schedule" indicates the fuel injection pulse width programmed into ECM, prior to any learned on board correction.	
A/F ALPHA-B1 [%]		×		When the engine is stopped, a cer-
A/F ALPHA-B2 [%]		×	 The mean value of the air-fuel ratio feedback correction factor per cycle is indicated. 	tain value is indicated.This data also includes the data for the air-fuel ratio learning control.
COOLAN TEMP/S [°C] or [°F]	×	×	The engine coolant temperature (determined by the signal voltage of the engine coolant temper- ature sensor) is displayed.	When the engine coolant temperature sensor is open or short-circuited, ECM enters fail-safe mode. The engine coolant temperature determined by the ECM is displayed.
HO2S1 (B1) [V]	×	×	The signal voltage of the heated oxygen sensor	
HO2S1 (B2) [V]	×		1 is displayed.	
HO2S2 (B1) [V]	×		The signal voltage of the heated oxygen sensor	
HO2S2 (B2) [V]	×		2 is displayed.	
HO2S1 MNTR (B1) [RICH/LEAN]	×	×	Display of heated oxygen sensor 1 signal during air-fuel ratio feedback control:	After turning ON the ignition switch, "RICH" is displayed until air-fuel mixture ratio feedback control
HO2S1 MNTR (B2) [RICH/LEAN]	×		RICH: means the mixture became "rich", and control is being affected toward a leaner mixture. LEAN: means the mixture became "lean", and control is being affected toward a rich mixture.	begins. • When the air-fuel ratio feedback is clamped, the value just before the clamping is displayed continuously.
HO2S2 MNTR (B1) [RICH/LEAN]	×		Display of heated oxygen sensor 2 signal: RICH: means the amount of oxygen after three	When the engine is stopped, a cer-
HO2S2 MNTR (B2) [RICH/LEAN]	×		way catalyst is relatively small. LEAN: means the amount of oxygen after three way catalyst is relatively large.	tain value is indicated.
VHCL SPEED SE [km/h] or [mph]	×	×	 The vehicle speed computed from the vehicle speed signal sent from combination meter is dis- played. 	
BATTERY VOLT [V]	×	×	The power supply voltage of ECM is displayed.	
ACCEL SEN 1 [V]	×	×	The accelerator pedal position sensor signal	
ACCEL SEN 2 [V]	×		voltage is displayed.	
THRTL SEN 1 [V]	×	×	The throttle position sensor signal voltage is dis-	
THRTL SEN 2 [V]	×		played.	
FUEL T/TEMP SE [°C] or [°F]	×		 The fuel temperature (determined by the signal voltage of the fuel tank temperature sensor) is displayed. 	
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 [ON/OFF] condition from the starter signal.	 After starting the engine, [OFF] is displayed regardless of the starter signal.

[TYPE 1]

	F014			[TYPE 1]
Monitored item [Unit]	ECM INPUT SIG- NALS	MAIN SIG- NALS	Description	Remarks
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) switch 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 [msec]		×	Indicates the actual fuel injection pulse width compensated by ECM according to the input	When the engine is stopped, a cer-
INJ PULSE-B2 [msec]			signals.	tain 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) [°CA] INT/V TIM (B2) [°CA]			Indicates [°CA] of intake camshaft advanced angle.	
INT/V SOL (B1) [%]			 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. The air conditioner relay control condition (deter-	
AIR COND RLY [ON/OFF]		×	mined by ECM according to the input signals) is indicated.	

Revision; 2004 April EC-117 2003 G35 Sedan

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Monitored item [Unit]	ECM INPUT SIG- NALS	MAIN SIG- NALS	Description	Remarks
FUEL PUMP RLY [ON/OFF]		×	 Indicates the fuel pump relay control condition determined by ECM according to the input sig- nals. 	
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. 	
COOLING FAN [ON/OFF]			 The control condition of the cooling fan (determined by ECM according to the input signals) is indicated. ON: Operation OFF: Stop 	
HO2S1 HTR (B1) [ON/OFF] HO2S1 HTR (B2)			 Indicates [ON/OFF] condition of heated oxygen sensor 1 heater determined by ECM according to the input signals. 	
[ON/OFF] HO2S2 HTR (B1) [ON/OFF]			Indicates [ON/OFF] condition of heated oxygen	
HO2S2 HTR (B2) [ON/OFF]			sensor 2 heater determined by ECM according to the input signals.	
IDL A/V LEARN [YET/CMPLT]			 Display the condition of idle air volume learning YET: Idle air volume learning has not been per- formed yet. CMPLT: Idle air volume learning has already been performed successfully. 	
TRVL AFTER MIL [km] or [mile]			Distance traveled while MIL is activated.	
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 combination meter is dis- played. 	
SET VHCL SPD [km/h] or [mph]			The preset vehicle speed is displayed.	
MAIN SW [ON/OFF]			 Indicates [ON/OFF] condition from CRUISE switch signal. 	
CANCEL SW [ON/OFF]			 Indicates [ON/OFF] condition from CANCEL switch signal. 	
RESUME/ACC SW [ON/OFF]			• Indicates [ON/OFF] condition from ACCEL/RES switch signal.	
SET SW [ON/OFF]			• Indicates [ON/OFF] condition from COAST/SET switch signal.	
BRAKE SW1 SW [ON/OFF]			 Indicates [ON/OFF] condition from ASCD brake switch signal, and ASCD clutch switch signal (M/ T models). 	
BRAKE SW2 SW [ON/OFF]			 Indicates [ON/OFF] condition of stop lamp switch signal. 	

[TYPE 1]

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Monitored item [Unit]	ECM INPUT SIG- NALS	MAIN SIG- NALS	Description	Remarks	А
VHCL SPD CUT [NON/CUT]			 Indicates the vehicle cruise condition. NON: Vehicle speed is maintained at the ASCD set speed. CUT: Vehicle speed increased to excessively high compared with the ASCD set speed, and ASCD operation is cut off. 		EC C
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 compared with the ASCD set speed, and ASCD operation is cut off. 		D E
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 signal sent from the TCM.		F
CRUISE LAMP [ON/OFF]			 Indicates [ON/OFF] condition of CRUISE lamp determined by the ECM according to the input signals. 		G
SET LAMP [ON/OFF]			 Indicates [ON/OFF] condition of SET lamp determined by the ECM according to the input signals. 		Н
Voltage [V]					
Frequency [msec], [Hz] or [%]				 Only "#" is displayed if item is unable to be measured. 	
DUTY-HI			Voltage, frequency, duty cycle or pulse width	Figures with "#"s are temporary	
DUTY-LOW			measured by the probe.	ones. They are the same figures as an actual piece of data which was	J
PLS WIDTH-HI				just previously measured.	
PLS WIDTH-LOW					K

NOTE:

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

DATA MONITOR (SPEC) MODE Monitored Item

Monitored item [Unit]	ECM input signals	Main signals	Description	Remarks
ENG SPEED [rpm]	×	×	 Indicates the engine speed computed from the signal of the crankshaft position sensor (POS) and camshaft position sensor (PHASE). 	
MAS A/F SE-B1 [V]	×	×	The signal voltage of the mass air flow sensor specification is displayed.	When engine is running specification range is indicated.
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.
A/F ALPHA-B1 [%] A/F ALPHA-B2 [%]		×	The mean value of the air-fuel ratio feed- back correction factor per cycle is indi- cated.	 When engine is running specification range is indicated. This data also includes the data for the air-fuel ratio learning control.

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	JUDGEMENT	CHECK ITEM (REMEDY)			
FUEL INJEC- TION	 Engine: Return to the original trouble condition Change the amount of fuel injection using CONSULT-II. 	If trouble symptom disappears, see CHECK ITEM.	 Harness and connectors Fuel injectors Heated oxygen sensor 1			
IGNITION TIM- ING	 Engine: Return to the original trouble condition Timing light: Set Retard the ignition timing using CONSULT-II. 	If trouble symptom disappears, see CHECK ITEM.	Perform "Idle Air Volume Learning".			
POWER BAL- ANCE	 Engine: After warming up, idle the engine. A/C switch "OFF" Shift lever "N" Cut off each injector signal one at a time using CONSULT-II. 	Engine runs rough or dies.	 Harness and connectors Compression Fuel injectors Power transistor Spark plugs Ignition coils 			
COOLING FAN	Ignition switch: ONTurn the cooling fan "ON" and "OFF" using CONSULT-II.	Cooling fan moves and stops.	Harness and connectorsCooling fan motorCooling fan relay			
ENG COOLANT TEMP	 Engine: Return to the original trouble condition Change the engine coolant temperature using CONSULT-II. 	If trouble symptom disappears, see CHECK ITEM.	Harness and connectorsEngine coolant temperature sensorFuel injectors			
FUEL PUMP RELAY	 Ignition switch: ON (Engine stopped) Turn the fuel pump relay "ON" and "OFF" using CONSULT-II 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-II. 	Engine speed changes according to the opening percent.	Harness and connectorsSolenoid valve			
FUEL/T TEMP SEN	Change the fuel tank temperature using CONSULT-II.					
VENT CON- TROL/V	 Ignition switch: ON (Engine stopped) Turn solenoid valve "ON" and "OFF" with the CONSULT-II and listen to operating sound. 	Solenoid valve makes an operating sound.	 Harness and connectors Solenoid valve			
V/T ASSIGN ANGLE	 Engine: Return to the original trouble condition Change intake valve timing using CONSULT-II. 	If trouble symptom disappears, see CHECK ITEM.	Harness and connectors Intake valve timing control solenoid valve			

DTC & SRT CONFIRMATION MODE SRT STATUS Mode

For details, refer to EC-62, "SYSTEM READINESS TEST (SRT) CODE" .

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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	Condition	Reference page
	PURGE FLOW P0441		EC-348
EVAP SYSTEM	EVAP SML LEAK P0442/P1442*]	EC-353
L VAI OTOTLIVI	EVAP V/S SML LEAK P0456/P1456*		EC-401
	PURG VOL CN/V P1444		EC-542
	HO2S1 (B1) P0133		EC-221
	HO2S1 (B1) P0134		EC-234
	HO2S1 (B1) P1143		EC-470
HO2S1	HO2S1 (B1) P1144		EC-476
110201	HO2S1 (B2) P0153	Refer to corresponding trouble diagnosis for	EC-221
	HO2S1 (B2) P0154	DTC.	EC-234
	HO2S1 (B2) P1163	IO2S1 (B2) P1163	
	HO2S1 (B2) P1164]	EC-476
	HO2S2 (B1) P0139		EC-253
	HO2S2 (B1) P1146		EC-483
H02S2	HO2S2 (B1) P1147		EC-494
10232	HO2S2 (B2) P0159		EC-253
	HO2S2 (B2) P1166		EC-483
	HO2S2 (B2) P1167		EC-494

^{*:} DTC P1442 and P1456 does not apply to V35 models but appears in DTC Work Support Mode screens.

REAL TIME DIAGNOSIS IN DATA MONITOR MODE (RECORDING VEHICLE DATA) Description

CONSULT-II has two kinds of triggers and they can be selected by touching "SETTING" in "DATA MONITOR" mode.

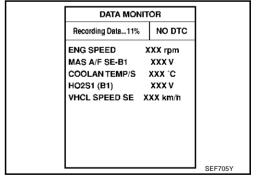
- 1. "AUTO TRIG" (Automatic trigger):
 - The malfunction will be identified on the CONSULT-II screen in real time.

In other words, DTC/1st trip DTC and malfunction item will be displayed if the malfunction is detected by ECM.

At the moment a malfunction is detected by ECM, "MONITOR" in "DATA MONITOR" screen is changed to "Recording Data ... xx%" as shown at right, and the data after the malfunction detection is recorded. Then when the percentage reached 100%, "REAL-TIME DIAG" screen is displayed. If "STOP" is touched on the screen during "Recording Data ... xx%", "REAL-TIME DIAG" screen is also displayed.

The recording time after the malfunction detection and the recording speed can be changed by "TRIGGER POINT" and "Recording Speed". Refer to CONSULT-II OPERATION MANUAL.

- 2. "MANU TRIG" (Manual trigger):
 - DTC/1st trip DTC and malfunction item will not be displayed automatically on CONSULT-II screen even though a malfunction is detected by ECM.
 - DATA MONITOR can be performed continuously even though a malfunction is detected.



SET RECORDING CONDITION	
AUTO TRIG	
MANU TRIG	
TRIGGER POINT	
0% 20% 40% 60% 80% 100%	
RECORDING SPEED	
MIN MAX	
/64 /32 /16 /8 /4 /2 FULL	SEF707X

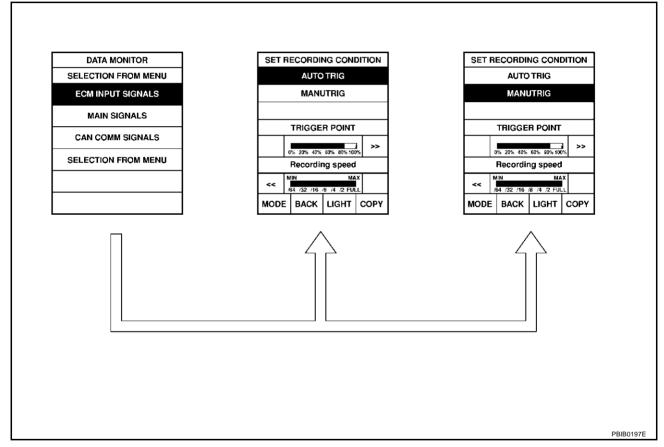
Revision; 2004 April EC-121 2003 G35 Sedan

Operation

- 1. "AUTO TRIG"
 - While trying to detect the DTC/1st trip DTC by performing the "DTC Confirmation Procedure", be sure
 to select to "DATA MONITOR (AUTO TRIG)" mode. You can confirm the malfunction at the moment it is
 detected.
 - While narrowing down the possible causes, CONSULT-II should be set in "DATA MONITOR (AUTO TRIG)" mode, especially in case the incident is intermittent.
 When you are inspecting the circuit by gently shaking (or twisting) the suspicious connectors, components and harness in the "DTC Confirmation Procedure", the moment a malfunction is found the DTC/1st trip DTC will be displayed. (Refer to "INCIDENT SIMULATION TESTS" in GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".)

2. "MANU TRIG"

• If the malfunction is displayed as soon as "DATA MONITOR" is selected, reset CONSULT-II to "MANU TRIG". By selecting "MANU TRIG" you can monitor and store the data. The data can be utilized for further diagnosis, such as a comparison with the value for the normal operating condition.



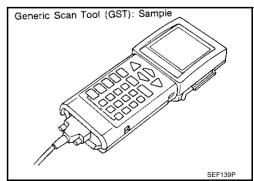
Generic Scan Tool (GST) Function DESCRIPTION

ABS00045

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

ISO9141 is used as the protocol.

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

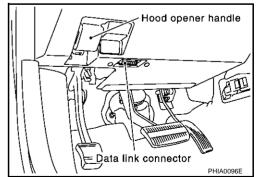


[TYPE 1]

FUNCTIO	IN	
Diagnostic test mode		Function
MODE 1	READINESS TESTS	This mode gains access to current emission-related data values, including analog inputs and outputs, digital inputs and outputs, and system status information.
MODE 2	(FREEZE DATA)	This mode gains access to emission-related data value which were stored by ECM during the freeze frame. For details, refer to EC-61 , "FREEZE FRAME DATA AND 1ST TRIP FREEZE FRAME DATA ".
MODE 3	DTCs	This mode gains access to emission-related power train trouble codes which were stored by ECM.
		This mode can clear all emission-related diagnostic information. This includes:
		Clear number of diagnostic trouble codes (MODE 1)
		Clear diagnostic trouble codes (MODE 3)
MODE 4	CLEAR DIAG INFO	Clear trouble code for freeze frame data (MODE 1)
		Clear freeze frame data (MODE 2)
		 Reset status of system monitoring test (MODE 1)
		Clear on board monitoring test results (MODE 6 and 7)
MODE 6	(ON BOARD TESTS)	This mode accesses the results of on board diagnostic monitoring tests of specific components/systems that are not continuously monitored.
MODE 7	(ON BOARD TESTS)	This mode enables the off board test drive to obtain test results for emission-related pow ertrain components/systems that are continuously monitored during normal driving conditions.
		This mode can close EVAP system in ignition switch "ON" position (Engine stopped). When this mode is performed, the following parts can be opened or closed.
		EVAP canister vent control valve open
		In the following conditions, this mode cannot function.
MODE		Low ambient temperature
MODE 8	_	Low battery voltage
		Engine running
		Ignition switch "OFF"
		Low fuel temperature
		Too much pressure is applied to EVAP system
MODE 9	(CALIBRATION ID)	This mode 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.
- Connect "GST" to data link connector, which is located under LH dash panel near the hood opener handle.



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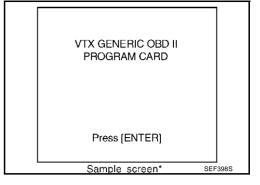
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[TYPE 1]

- 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 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

Sample screen*

F9: UNIT CONVERSION

SEF416S

[TYPE 1]

CONSULT-II Reference Value in Data Monitor

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Remarks:

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 sensor and other ignition timing related sensors.

MONITOR ITEM		NDITION	SPECIFICATION
ENG SPEED	Tachometer: Connect Run engine and compare tachome value.	eter indication with the CONSULT-II	Almost the same speed as the CONSULT-II value.
	Engine: After warming up	Idle	Approx. 1.1 - 1.5V
MAS A/F SE-B1	Air conditioner switch: OFFShift lever: NNo-load	2,500 rpm	Approx. 1.7 - 2.4V
	Engine: After warming up	Idle	2.5 - 3.5 msec
B/FUEL SCHDL	Shift lever: NAir conditioner switch: OFFNo-load	2,000 rpm	2.5 - 3.5 msec
A/F ALPHA-B1 A/F ALPHA-B2	Engine: After warming up	Maintaining engine speed at 2,000 rpm	54% - 155%
COOLAN TEMP/S	Engine: After warming up		More than 70°C (158°F)
HO2S1 (B1) HO2S1 (B2)	Engine: After warming up	Maintaining engine speed at 2,000 rpm	0 - 0.3V ←→ Approx. 0.6 - 1.0V
HO2S2 (B1) HO2S2 (B2)	 Warm-up condition After keeping engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load. 	Revving engine from idle to 3,000 rpm quickly.	0 - 0.3V ←→ Approx. 0.6 - 1.0V
HO2S1 MNTR (B1) HO2S1 MNTR (B2)	Engine: After warming up	Maintaining engine speed at 2,000 rpm	LEAN ←→ RICH Changes more than 5 times during 10 seconds.
HO2S2 MNTR (B1) HO2S2 MNTR (B2)	 Warm-up condition After keeping engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load. 	Revving engine from idle to 3,000 rpm quickly.	LEAN ←→ RICH
VHCL SPEED SE	Turn drive wheels and compare C indication.	ONSULT-II value with the speedometer	Almost the same speed as the speedometer indication
BATTERY VOLT	Ignition switch: ON (Engine stopped)	ed)	11 - 14V
ACCEL SEN1	Ignition switch: ON	Accelerator pedal: Fully released	0.41 - 0.72V
ACCLL SENT	(Engine stopped)	Accelerator pedal: Fully depressed	More than 3.2V
ACCEL SEN2*	Ignition switch: ON	Accelerator pedal: Fully released	0.15 - 0.98V
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	(Engine stopped)	Accelerator pedal: Fully depressed	More than 2.98V
THRTL SEN1	• Ignition switch: ON	Accelerator pedal: Fully released	More than 0.36V
THRTL SEN2*	(Engine stopped) • Shift lever: D	Accelerator pedal: Fully depressed	Less than 4.75V
EVAP SYS PRES	Ignition switch: ON	Approx. 1.8 - 4.8V	
START SIGNAL	• Ignition switch: ON \rightarrow START \rightarrow 0	ON	$OFF \to ON \to OFF$
CLSD THL POS	Ignition switch: ON	Accelerator pedal: Fully released	ON
OLOD THE TOO	(Engine stopped)	Accelerator pedal: Slightly depressed	OFF

			[TYPE 1]
MONITOR ITEM	CON	IDITION	SPECIFICATION
	Engine: After warming up, idle	Air conditioner switch: OFF	OFF
AIR COND SIG	the engine	Air conditioner switch: ON (Compressor operates.)	ON
P/N POSI SW	Ignition switch: ON	Shift lever: P or N	ON
17141 031 344	• Igrition switch. ON	Shift lever: Except above	OFF
PW/ST SIGNAL	Engine: After warming up, idle the engine	Steering wheel is in neutral position. (Forward direction)	OFF
	the origine	Steering wheel is turned.	ON
LOAD SIGNAL	Ignition switch: ON	Rear window defogger switch is ON and/or lighting switch is in 2nd.	ON
	G ignilian amain an	Rear window defogger switch is OFF and lighting switch is OFF.	OFF
IGNITION SW	• Ignition switch: $ON \rightarrow OFF \rightarrow ON$		$ON \to OFF \to ON$
HEATER FAN SW	Engine: After warming up, idle	Heater fan is operating.	ON
TIENTEN LAN OW	the engine	Heater fan is not operating	OFF
BRAKE SW	Ignition switch: ON	Brake pedal: Fully released	OFF
DIVARL SW	• Ignition switch. ON	Brake pedal: Slightly depressed	ON
	Engine: After warming up	Idle	2.0 - 3.0 msec
INJ PULSE-B1 INJ PULSE-B2	Shift lever: NAir conditioner switch: OFFNo-load	2,000 rpm	1.9 - 2.9 msec
	Engine: After warming up	Idle	13° - 18° BTDC
IGN TIMING	 Shift lever: N Air conditioner switch: OFF No-load 	2,000 rpm	25° - 45° BTDC
	Engine: After warming up	Idle	10% - 35%
CAL/LD VALUE	Shift lever: N Air conditioner switch: OFF No-load	2,500 rpm	10% - 35%
	Engine: After warming up	Idle	2.0 - 6.0 g·m/s
MASS AIRFLOW	Shift lever: N Air conditioner switch: OFF No-load	2,500 rpm	7.0 - 20.0 g·m/s
	Engine: After warming up	Idle	0%
PURG VOL C/V	 Shift lever: N Air conditioner switch: OFF No-load 	2,000 rpm	_
	Engine: After warming up	Idle	−5° - 5°CA
INT/V TIM (B1) INT/V TIM (B2)	 Shift lever: N Air conditioner switch: OFF No-load 	When revving engine up to 2,000 rpm quickly	Approx. 0° - 30°CA
	Engine: After warming up	Idle	0% - 2%
INT/V SOL (B1) INT/V SOL (B2)	Shift lever: NAir conditioner switch: OFFNo-load	When revving engine up to 2,000 rpm quickly	Approx. 0% - 50%
	• Engine: After werming up idle	Air conditioner switch: OFF	OFF
AIR COND RLY	Engine: After warming up, idle the engine	Air conditioner switch: ON (Compressor operates)	ON

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			[TYPE 1]	•
MONITOR ITEM	CC	ONDITION	SPECIFICATION	
	For 1 second after turning ignitio	ON	Α	
FUEL PUMP RLY	Engine running or cranking	ON		
	Except above conditions	OFF	EC	
VENT CONT/V	Ignition switch: ON		OFF	
THRTL RELAY	Ignition switch: ON		ON	
		Engine coolant temperature is 94°C (201°F) or less	OFF	С
COOLING FAN	Engine: After warming up, idle the engineAir conditioner switch: OFF	Engine coolant temperature is between 95°C (203°F) and 99°C (210°F)	ON (Low speed)	D
		Engine coolant temperature is 100°C (212°F) or more	ON (High speed)	Е
LICOCALITE (DA)	Engine: After warming up		ON	
HO2S1 HTR (B1) HO2S1 HTR (B2)	• Engine speed: Below 3,600 rpm		ON	
(==,	• Engine speed: Above 3,600 rpm		OFF	F
	• Engine speed is below 3,600 rpm	n after the following conditions are met.		
HO2S2 HTR (B1)	- Engine: After warming up		ON	G
HO2S2 HTR (B2)	 Keeping the engine speed between at idle for 1 minute under no load 		G	
	• Engine speed: Above 3,600 rpm	OFF	Н	
TRVL AFTER MIL	Ignition switch: ON	Vehicle has traveled after MIL has turned ON.	0 - 65,535 km (0 - 40,723 mile)	П
	Ignition switch: ON (Engine stop)	Approx. 0V	ı	
AC PRESS SEN	Engine: Idle	1.0 - 4.0V		
	Air conditioner switch: OFF	1.0 - 4.00		
VHCL SPEED SE	Turn drive wheels and compare indication.	CONSULT-II value with the speedometer	Almost the same speed as the speedometer indication	J
SET VHCL SPD	Engine: Running	Engine: Running ASCD: Operating.		K
MAIN SW	- Ignition quitable ON	CRUISE switch: Pressed	ON	
MAIN SW	Ignition switch: ON	CRUISE switch: Released	OFF	
CANCEL SW	Ignition switch: ON	CANCEL switch: Pressed	ON	L
CANCLE SW	• Igrillion Switch. ON	CANCEL switch: Released	OFF	
RESUME/ACC SW	Ignition switch: ON	ACCEL/RES switch: Pressed	ON	M
RESONIE/ACC SW	• Igrittori switch. Oiv	ACCEL/RES switch: Released	OFF	
SET SW	Ignition switch: ON	COAST/SET switch: Pressed	ON	
JET SW	• Igrittori switch. Oiv	COAST/SET switch: Released	OFF	
BRAKE SW1	Ignition switch: ON	Brake pedal: Fully released	ON	
	• Igilition Switch. Olv	Brake pedal: Slightly depressed	OFF	
BRAKE SW2	Ignition switch: ON	Brake pedal: Fully released	OFF	
	• Igrittion Switch. ON	Brake pedal: Slightly depressed	ON	
CRUISE LAMP	Ignition switch: ON	CRUISE lamp: Illuminated	ON	
	• Igrittori Switori. ON	CRUISE lamp: Not illuminated	OFF	
SET LAMP	Ignition switch: ON	SET lamp: Illuminated	ON	
JET LAWII	• Igrittion owiton. O14	SET lamp: Not illuminated	OFF	•

^{*:} 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.

Major Sensor Reference Graph in Data Monitor Mode

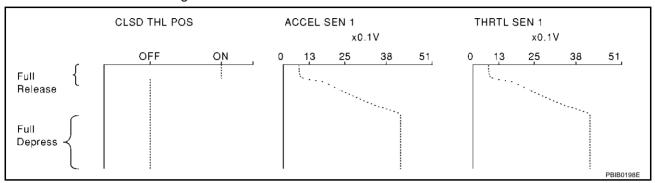
ABS00047

The following are the major sensor reference graphs in "DATA MONITOR" mode.

CLSD THL POS, ACCEL SEN 1, THRTL SEN 1

Below is the data for "CLSD THL POS", "ACCEL SEN 1" and "THRTL SEN 1" when depressing the accelerator pedal with the ignition switch "ON" and with selector lever in "D" position.

The signal of "ACCEL SEN 1" and "THRTL SEN 1" should rise gradually without any intermittent drop or rise after "CLSD THL POS" is changed from "ON" to "OFF".

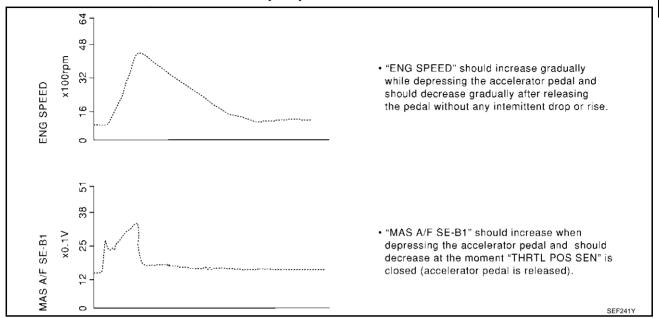


[TYPE 1]

ENG SPEED, MAS A/F SE-B1, THRTL SEN 1, HO2S2 (B1), HO2S1 (B1), INJ PULSE-B1

Below is the data for "ENG SPEED", "MAS A/F SE-B1", "THRTL SEN 1", "HO2S2 (B1)", "HO2S1 (B1)" and "INJ PULSE-B1" when revving engine quickly up to 4,800 rpm under no load after warming up engine sufficiently.

Each value is for reference, the exact value may vary.



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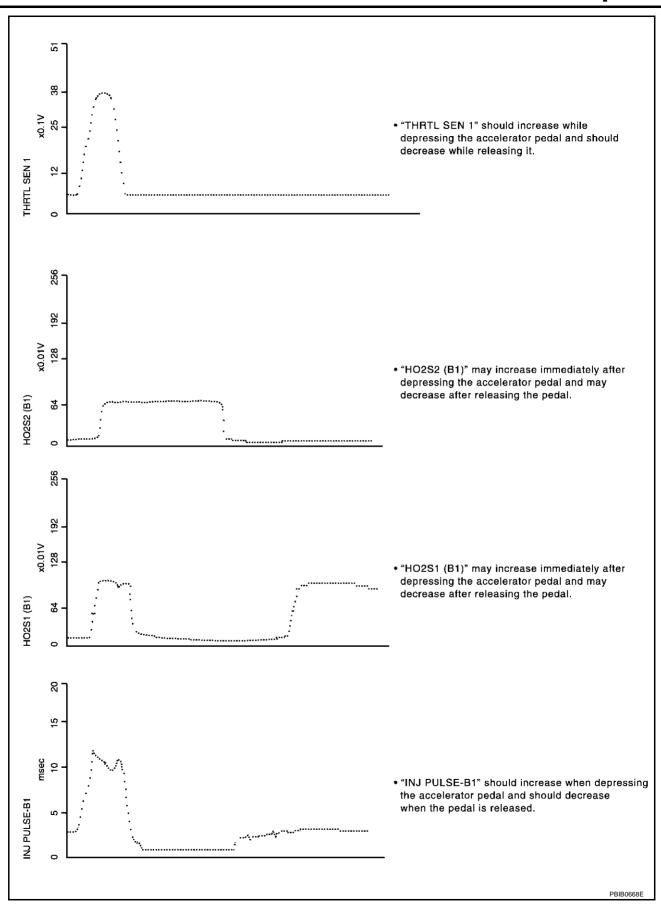
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TROUBLE DIAGNOSIS - SPECIFICATION VALUE

[TYPE 1]

TROUBLE DIAGNOSIS - SPECIFICATION VALUE

PFP:00031

Description

The specification (SP) value indicates the tolerance of the value that is displayed in "DATA MONITOR (SPEC)" mode of CONSULT-II during normal operation of the Engine Control System. When the value in "DATA MONI-TOR (SPEC)" mode is within the SP value, the Engine Control System is confirmed OK. When the value in "DATA MONITOR (SPEC)" 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 light the

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 (The signal voltage of the mass air flow sensor)

Testing Condition

ARSONO40

- Vehicle driven distance: More than 5,000 km (3,017 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*1
- Electrical load: Not applied*2
- Engine speed: Idle
- *1: After the engine is warmed up to normal operating temperature, drive vehicle until "FLUID TEMP SE" (A/T fluid temperature sensor signal) indicates more than 60°C (140°F).
- *2: Rear window defogger switch, air conditioner switch, lighting switch are "OFF". Steering wheel is straight ahead.

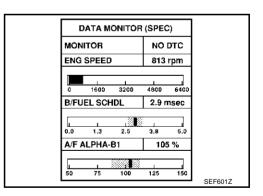
Inspection Procedure

ABS0004A

NOTE:

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

- Perform EC-86, "Basic Inspection".
- Confirm that the testing conditions indicated above are met.
- Select "B/FUEL SCHDL", "A/F ALPHA-B1", "A/F ALPHA-B2" and "MAS A/F SE-B1" in "DATA MONITOR (SPEC)" mode with CONSULT-II.
- 4. Make sure that monitor items are within the SP value.
- If NG, go to EC-132, "Diagnostic Procedure".



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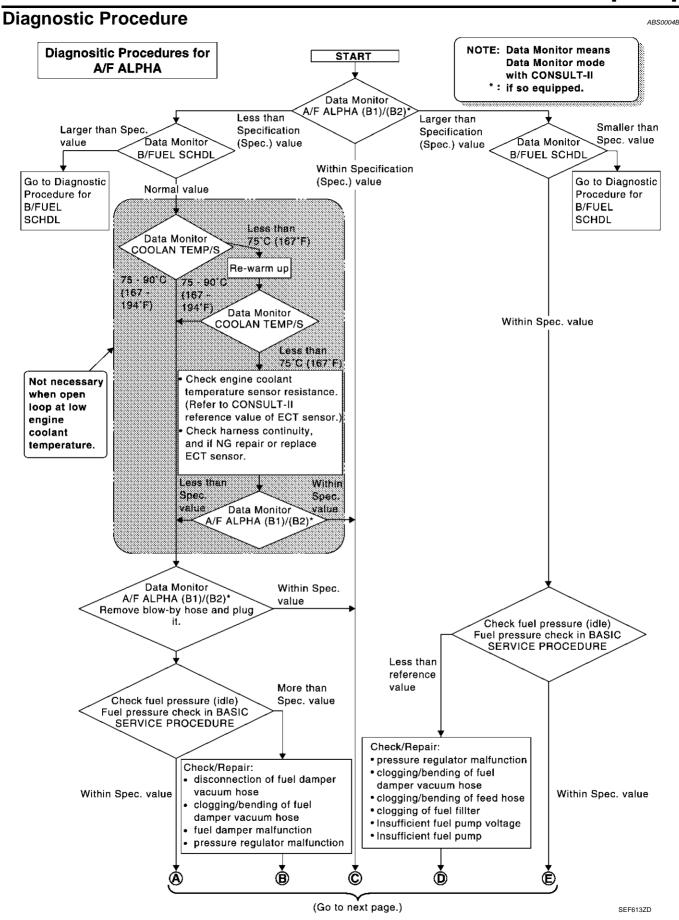
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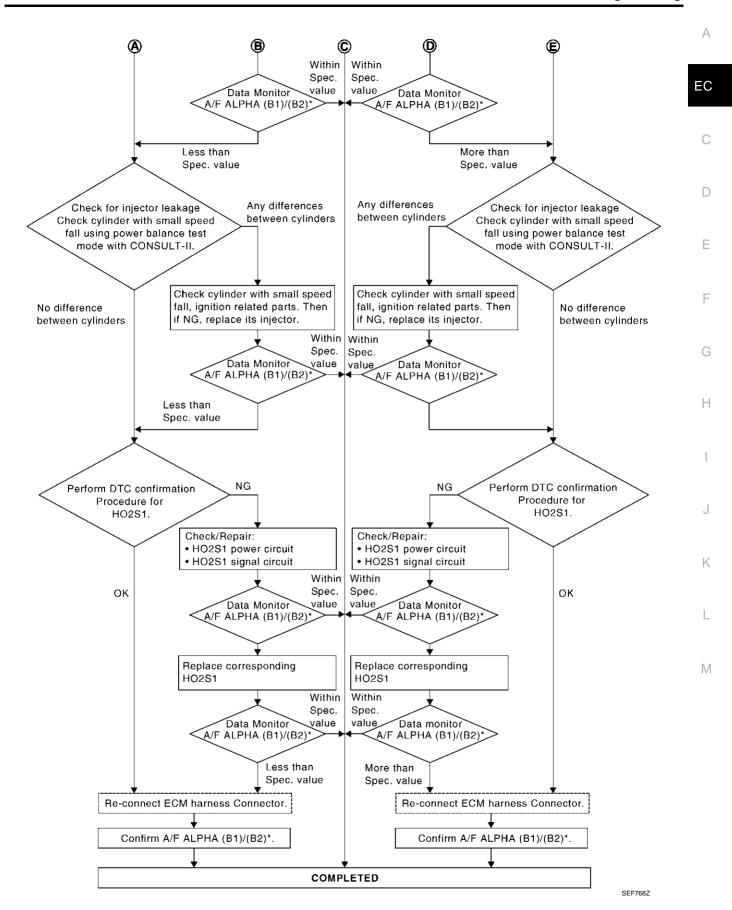
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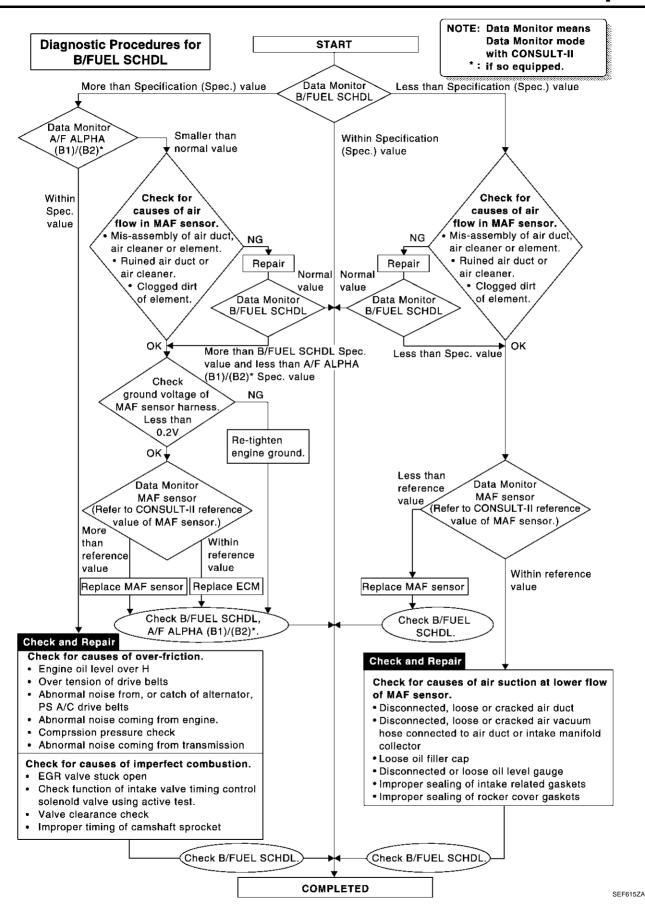
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TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT

[TYPE 1]

TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT

PFP:00006

Description

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Intermittent incidents (I/I) may occur. In many cases, the malfunction resolves itself (the part or circuit function returns to normal without intervention). It is important to realize that the symptoms described in the customer's complaint often do not recur on (1st trip) DTC visits. Realize also that the most frequent cause of I/I occurrences is poor electrical connections. Because of this, the conditions under which the incident occurred may not be clear. Therefore, circuit checks made as part of the standard diagnostic procedure may not indicate the specific malfunctioning area.

Common I/I Report Situations

STEP in Work Flow	K Flow Situation				
II The CONSULT-II is used. The SELF-DIAG RESULTS screen shows time data other than "0" or "[1t]"					
III	The symptom described by the customer does not recur.				
IV (1st trip) DTC does not appear during the DTC Confirmation Procedure.					
VI The Diagnostic Procedure for PXXXX does not indicate the malfunctioning area.					

Diagnostic Procedure

ABS0004D

1. INSPECTION START

Erase (1st trip) DTCs. Refer to <u>EC-69</u>, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" .

>> GO TO 2.

2. CHECK GROUND TERMINALS

Check ground terminals for corroding or loose connection.

Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident", "CIRCUIT INSPECTION", "Ground Inspection".

OK or NG

OK >> GO TO 3.

NG >> Repair or replace.

3. SEARCH FOR ELECTRICAL INCIDENT

Perform GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident", "INCIDENT SIMULATION TESTS".

OK or NG

OK >> GO TO 4.

NG >> Repair or replace.

4. CHECK CONNECTOR TERMINALS

Refer to <u>GI-23, "How to Check Terminal"</u>, "HOW TO PROBE CONNECTORS", "How to Check Enlarged Contact Spring of Terminal".

OK or NG

OK >> INSPECTION END

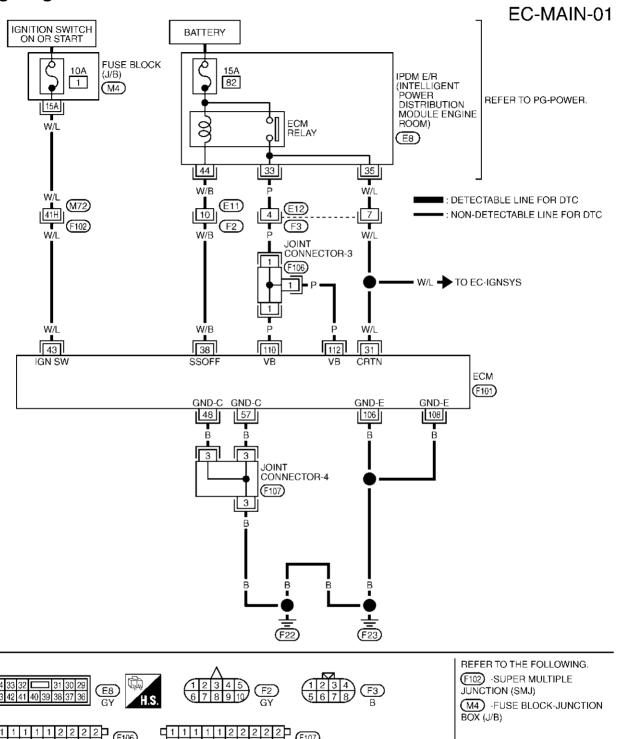
NG >> Repair or replace connector.

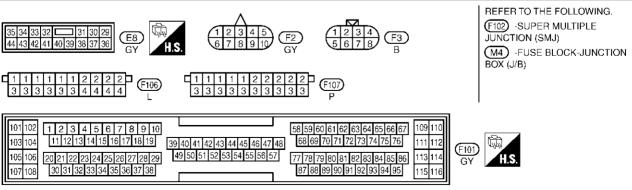
POWER SUPPLY CIRCUIT FOR ECM

PFP:24110

ABS0004F







POWER SUPPLY CIRCUIT FOR ECM

[TYPE 1]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
31	W/L	Counter current return	[Ignition switch "ON"]	BATTERY VOLTAGE (11 - 14V)
38	W/B	ECM relay (Self shut-off)	[Engine is running] [Ignition switch "OFF"] ● For a few seconds after turning ignition switch "OFF"	0 - 1.5V
		(Sell Silut-Oll)	[Ignition switch "OFF"] • A few seconds passed after turning ignition switch "OFF"	BATTERY VOLTAGE (11 - 14V)
		Ignition switch	[Ignition switch "OFF"]	0V
43	W/L		[Ignition switch "ON"]	BATTERY VOLTAGE (11 - 14V)
48 57	B B	ECM ground	[Engine is running] • Idle speed	Engine ground
106 108	B B	ECM ground	[Engine is running] • Idle speed	Engine ground
110 112	P P	Power supply for ECM	[Ignition switch "ON"]	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

1. INSPECTION START

Start engine.

Is engine running?

Yes or No

Yes >> GO TO 7. No >> GO TO 2.

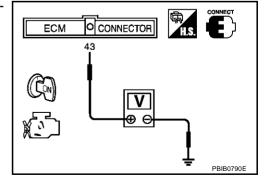
2. CHECK ECM POWER SUPPLY CIRCUIT-I

- 1. Turn ignition switch "OFF" and then "ON".
- Check voltage between ECM terminal 43 and ground with CON-SULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 4. NG >> GO TO 3.



2003 G35 Sedan

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$\overline{3}$. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M72, F102
- Fuse block (J/B) connector M4
- 10A fuse
- Harness for open or short between ECM and fuse
 - >> Repair harness or connectors.

4. CHECK ECM GROUND CIRCUIT FOR OPEN AND SHORT-I

- 1. Turn ignition switch "OFF".
- Disconnect ECM harness connector.
- 3. Check harness continuity between ECM terminals 48, 57, 106, 108 and engine ground. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to power.

OK or NG

OK >> GO TO 6. NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-4
- Harness for open or short between ECM and engine ground
 - >> Repair open circuit or short to power in harness or connectors.

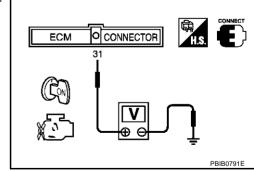
6. CHECK ECM POWER SUPPLY CIRCUIT-II

- Reconnect ECM harness connector.
- 2. Turn ignition switch "ON".
- 3. Check voltage between ECM terminal 31 and ground with CON-SULT-II or tester.

Voltage: Battery voltage

OK or NG

OK \rightarrow Go to <u>EC-589</u>, "<u>IGNITION SIGNAL</u>". NG \rightarrow GO TO 7.



POWER SUPPLY CIRCUIT FOR ECM

[TYPE 1]

7. CHECK ECM POWER SUPPLY CIRCUIT-III

- 1. Turn ignition switch "ON" and then "OFF".
- 2. Check voltage between ECM terminals 110, 112 and ground with CONSULT-II or tester.

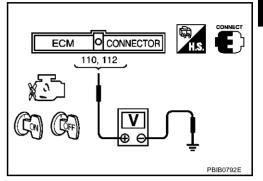
Voltage: After turning ignition switch "OFF", battery voltage will exist for a few seconds, then drop approximately 0V.

OK or NG

OK >> GO TO 8.

NG (Battery voltage does not exist.)>>GO TO 10.

NG (Battery voltage exists for more than a few seconds.)>>GO TO 17.



8. CHECK ECM POWER SUPPLY CIRCUIT-IV

- 1. Disconnect ECM harness connector.
- 2. Disconnect IPDM E/R harness connector.
- 3. Check harness continuity between ECM terminal 31 and IPDM E/R terminal 35. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 17. NG >> GO TO 9.

9. DETECT MALFUNCTIONING PART

Check the following.

- Harness or connectors E12, F3
- Harness for open or short between ECM and IPDM E/R

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

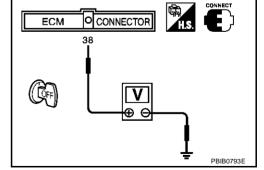
10. CHECK ECM POWER SUPPLY CIRCUIT-V

- 1. Turn ignition switch "OFF".
- 2. Check voltage between ECM terminal 38 and ground with CON-SULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 11. NG >> GO TO 13.



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11. CHECK ECM POWER SUPPLY CIRCUIT-VI

- 1. Disconnect ECM harness connector.
- 2. Disconnect IPDM E/R harness connector.
- Check harness continuity between ECM terminals 110, 112 and IPDM E/R terminal 33. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 16. NG >> GO TO 12.

12. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-3
- Harness or connectors E12, F3
- Harness for open or short between ECM and IPDM E/R
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

13. CHECK ECM POWER SUPPLY CIRCUIT-VII

- 1. Disconnect ECM harness connector.
- 2. Disconnect IPDM E/R harness connector.
- 3. Check harness continuity between ECM terminal 38 and IPDM E/R terminal 44. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 15. NG >> GO TO 14.

14. DETECT MALFUNCTIONING PART

Check the following.

- Harness or connectors E11, F2
- Harness for open or short between ECM and IPDM E/R
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

15. CHECK 15A FUSE

- Disconnect 15A fuse from IPDM E/R.
- 2. Check 15A fuse.

OK or NG

OK >> GO TO 17.

NG >> Replace 15A fuse.

POWER SUPPLY CIRCUIT FOR ECM

[TYPE 1]

16. CHECK ECM GROUND CIRCUIT FOR OPEN AND SHORT-II

- Turn ignition switch "OFF".
- 2. Disconnect ECM harness connector.
- Check harness continuity between ECM terminals 48, 57, 106, 108 and engine ground. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to power.

OK or NG

OK >> GO TO 17.

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

17. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

OK or NG

OK >> Replace IPDM E/R. Refer to PG-16.

NG >> Repair open circuit or short to power in harness or connectors. EC

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DTC U1000, U1001 CAN COMMUNICATION LINE

[TYPE 1]

DTC U1000, U1001 CAN COMMUNICATION LINE

PFP:23710

DescriptionABS0004G

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.

On Board Diagnosis Logic

ABS0004H

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
U1000* ¹ 1000* ¹ U1001* ² 1001* ²	CAN communication line	 ECM cannot communicate to other control units. ECM cannot communicate for more than the specified time. 	Harness or connectors (CAN communication line is open or shorted)

^{*1:} This self-diagnosis has the one trip detection logic.

DTC Confirmation Procedure

ABS00041

- 1. Turn ignition switch "ON" and wait at least 3 seconds.
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- 3. If 1st trip DTC is detected, go to EC-144, "Diagnostic Procedure".

^{*2:} The MIL will not light up for this diagnosis.

DTC U1000, U1001 CAN COMMUNICATION LINE

[TYPE 1]

Wiring Diagram

ABS0004J

EC-CAN-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC
: DATA LINE

TO LAN-CAN

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101 102 1 2 3 4 103 104 11 12 13 1 1 105 106 20 21 12 22 2	5 6 7 8 9 10 415 16 17 18 19 39 40 41	58 59 42 43 44 45 46 47 48 68 69 1152 53 54 55 156 57 77 79	9 70 71 72 73 74 75 76 111 112
105 106 20 21 22 23 107 108 30 31 32 3	24 52 50 51 50 53	1 52 53 54 55 56 57 77 78 87 8	79 80 81 82 83 84 85 86 113 114 8 89 90 91 92 93 94 95 115 116



ECM (F101)

TBWT0131E

DTC U1000, U1001 CAN COMMUNICATION LINE

[TYPE 1]

ABS0004K

Diagnostic Procedure

Go to LAN-4, "CAN Communication Unit" .

[TYPE 1]

DTC P0011, P0021 IVT CONTROL

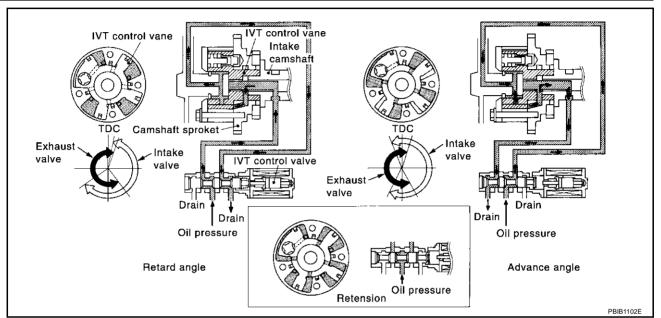
PFP:23796

Description SYSTEM DESCRIPTION

ABS0004L

EC

Sensor	Input signal to ECM	ECM function	Actuator
Crankshaft position sensor (POS)	Engine speed		
Camshaft position sensor (PHASE)	Lingine speed	Intake valve	Intake valve timing control
Engine coolant temperature sensor	Engine coolant temperature	timing control	solenoid valve
Wheel sensor	Vehicle speed		



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 DESCRIPTION

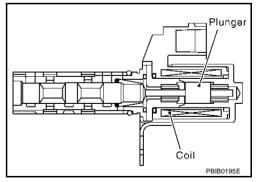
Intake valve timing control solenoid valve is activated by ON/OFF pulse duty (ratio) signals from the ECM.

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.



CONSULT-II Reference Value in Data Monitor Mode

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Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
	Engine: After warming up	Idle	−5° - 5°CA
INT/V TIM (B1) INT/V TIM (B2)	Shift lever: NAir conditioner switch: OFFNo-load	When revving engine up to 2,000 rpm quickly	Approx. 0° - 30°CA

MONITOR ITEM	CONDITION		SPECIFICATION
	Engine: After warming up	Idle	0% - 2%
INT/V SOL (B1) INT/V SOL (B2)	Shift lever: NAir conditioner switch: OFFNo-load	When revving engine up to 2,000 rpm quickly	Approx. 0% - 50%

On Board Diagnosis Logic

ABS0004N

DTC No.	Trouble diagnosis name	Detecting condition	Possible cause
P0011 0011 (Bank 1)			Harness or connectors (Intake valve timing control solenoid valve circuit is open or shorted.) Intake valve timing control solenoid valve circuit is open or shorted.)
P0021 0021 (Bank 2)	Intake valve timing control performance	There is a gap between angle of target and phase-control angle degree.	 Intake valve timing control solenoid valve Crankshaft position sensor (POS) Camshaft position sensor (PHASE) Accumulation of debris to the signal pick-up portion of the camshaft

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode.

Detected items Engine operating condition in fail-safe mode	
Intake valve timing control	The signal is not energized to the solenoid valve and the valve control does not function.

DTC Confirmation Procedure

AB\$00040

CAUTION:

Always drive at a safe speed.

NOTE

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

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

(WITH CONSULT-II

- 1. Turn ignition switch "ON" and select "DATA MONITOR" mode with CONSULT-II.
- 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.

VHCL SPEED SE	100 - 120 km/h (63 - 75 MPH)
ENG SPEED	2,000 - 4,000 rpm
COOLAN TEMP/S	60 - 120°C (140 - 248°F)
B/FUEL SCHDL	More than 7.26 msec
Selector lever	D position

MONITOR ENG SPEED B/FUEL SCHDL XXX msec COOLAN TENP/S VHCL SPEED SE XXX km/h INT/V TIM (B1) XXX "CA INT/V TIM (B2) XXX "CA INT/V SOL (B1) XXX %	DATA MOI	NITOR	
B/FUEL SCHDL XXX msec COOLANTENP/S XXX 'C VHCL SPEED SE XXX km/h INT/V TIM (B1) XXX 'CA INT/V TIM (B2) XXX 'CA	MONITOR	NO DTC	
COOLANTENP/S XXX °C VHCL SPEED SE XXX km/h INT/V TIM (B1) XXX °CA INT/V TIM (B2) XXX °CA	ENG SPEED	XXX rpm	
VHCL SPEED SE XXX km/h INT/V TIM (B1) XXX 'CA INT/V TIM (B2) XXX 'CA	B/FUEL SCHDL	XXX msec	
INT/V TIM (B1) XXX *CA INT/V TIM (B2) XXX *CA	COOLAN TENP/S	XXX °C	
INT/V TIM (B2) XXX *CA	VHCL SPEED SE	XXX km/h	
, , ,	INT/V TIM (B1)	XXX °CA	
INT/V SOL (B1) XXX %	INT/V TIM (B2)	XXX CA	
	INT/V SOL (B1)	XXX %	
INT/V SOL (B2) XXX %	INT/V SOL (B2)	XXX %	
			SEF350

- 4. Stop vehicle with engine running and let engine idle for 10 seconds.
- 5. If 1st trip DTC is detected, go to <u>EC-151, "Diagnostic Procedure"</u>. If 1st trip DTC is not detected, go to next step.
- Maintain the following conditions for at least 20 consecutive seconds.

ENG SPEED	1,800 - 3,175 rpm (A constant rotation is maintained.)
COOLANT TEMPS	70 - 105°C (158 - 221°F)

DTC P0011, P0021 IVT CONTROL

[TYPE 1]

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.)

7. If the 1st trip DTC is detected, go to EC-151, "Diagnostic Procedure".

WITH GST

Follow the procedure "WITH CONSULT-II" above.

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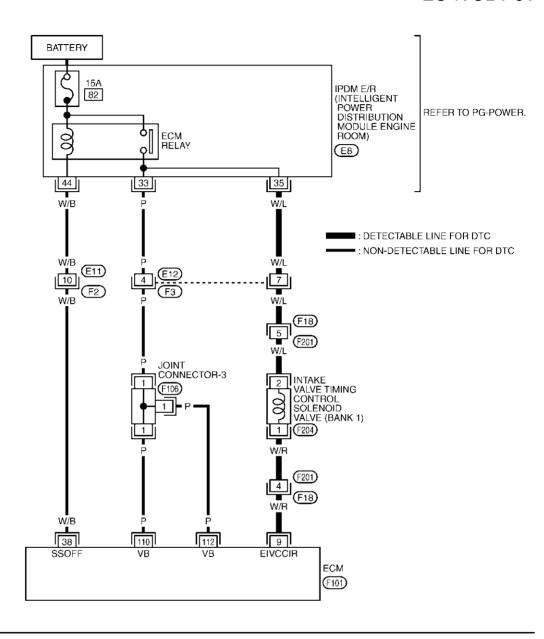
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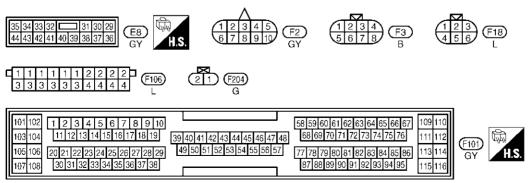
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Wiring Diagram BANK 1

ABS0004P

EC-IVCB1-01





TBWT0132E

DTC P0011, P0021 IVT CONTROL

[TYPE 1]

Specification data are reference values and are measured between each terminal and ground. Pulse signal is measured by CONSULT-II.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
			[Engine is running]Warm-up conditionIdle speed	BATTERY VOLTAGE (11 - 14V)
9	W/R	Intake valve timing control solenoid valve (bank 1)	 [Engine is running] Warm-up condition When revving engine up to 2,000 rpm quickly 	7 - 12V★ → 10.0 V/Div
				PBIB1790E

^{★:} Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

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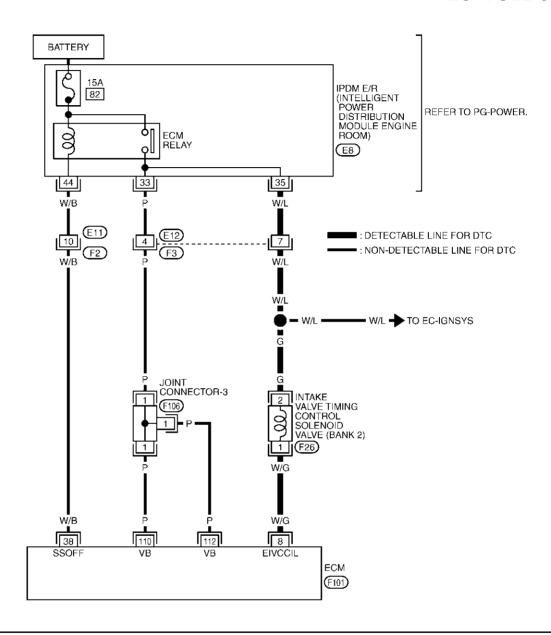
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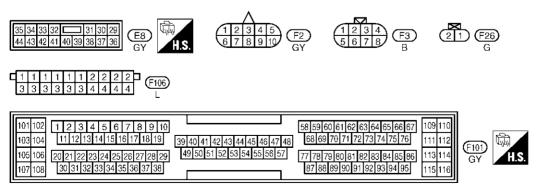
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BANK 2

EC-IVCB2-01





TBWT0133E

DTC P0011, P0021 IVT CONTROL

[TYPE 1]

Specification data are reference values and are measured between each terminal and ground. Pulse signal is measured by CONSULT-II.

CAUTION:

Do not 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.

			•	
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
			[Engine is running] • Warm-up condition • Idle speed	BATTERY VOLTAGE (11 - 14V)
8	W/G	Intake valve timing control solenoid valve (bank 2)	[Engine is running]Warm-up conditionWhen revving engine up to 2,000 rpm quickly	7 - 12V*
				PBIB1790E

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

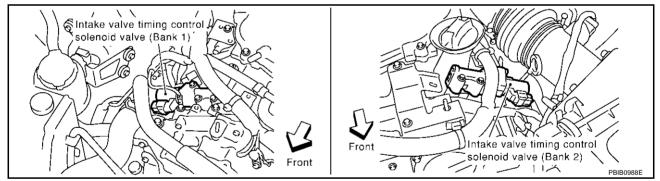
Diagnostic Procedure

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1. CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE POWER SUPPLY CIRCUIT

1. Turn ignition switch "OFF".

2. Disconnect intake valve timing control solenoid valve harness connector.

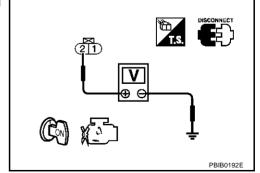


- 3. Turn ignition switch "ON".
- 4. Check voltage between intake valve timing control solenoid valve terminal 2 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 3. NG >> GO TO 2.



Revision; 2004 April EC-151 2003 G35 Sedan

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$\overline{2}$. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Harness connectors F18, F201
- IPDM E/R harness connector E8
- Harness for open or short between intake valve timing control solenoid valve and IPDM E/R
- Harness for open or short between ECM and IPDM E/R
 - >> Repair harness or connectors.

3. CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch "OFF".
- Disconnect ECM harness connector.
- 3. Check harness continuity between ECM terminal 9 (bank 1) or 8 (bank 2) and intake valve timing control solenoid valve terminal 1. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 5. NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F18, F201
- Harness for open and short between ECM and intake valve timing control solenoid valve
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE

Refer to EC-153, "Component Inspection".

OK or NG

OK >> GO TO 6.

NG >> Replace intake valve timing control solenoid valve.

6. CHECK CRANKSHAFT POSITION SENSOR (POS)

Refer to EC-332, "Component Inspection".

OK or NG

OK >> GO TO 7.

NG >> Replace crankshaft position sensor (POS).

7. CHECK CAMSHAFT POSITION SENSOR (PHASE)

Refer to EC-341, "Component Inspection".

OK or NG

OK >> GO TO 8.

NG >> Replace camshaft position sensor (PHASE).

DTC P0011, P0021 IVT CONTROL

[TYPE 1]

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ABS0004R

8. CHECK CAMSHAFT

Check accumulation of debris to the signal pick-up portion of the camshaft. Refer to $\underline{\text{EM-71}}$, "CAMSHAFT".

OK >> GO TO 9.

NG >> Remove debris and clean the signal pick-up cutout of camshaft.

9. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

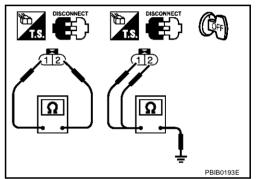
For wiring diagram, refer to EC-329 for CKP sensor (POS), and EC-336 for CMP sensor (PHASE).

>> INSPECTION END

Component Inspection INTAKE VALVE TIMING CONTROL SOLENOID VALVE

- 1. Disconnect intake valve timing control solenoid valve harness connector.
- 2. Check resistance between intake valve timing control solenoid valve terminals as follows.

Terminals	Resistance
1 and 2	7.0 - 7.5Ω at 20°C (68°F)
1 or 2 and ground	${}^{\infty}\Omega$ (Continuity should not exist)



ABS0004S

Removal and Installation INTAKE VALVE TIMING CONTROL SOLENOID VALVE

Refer to EM-54, "TIMING CHAIN".

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DTC P0031, P0032, P0051, P0052 HO2S1 HEATER

[TYPE 1]

DTC P0031, P0032, P0051, P0052 HO2S1 HEATER

PFP:22690

Description SYSTEM DESCRIPTION

ABS0004T

Sensor	Input signal to ECM	ECM function	Actuator
Camshaft position sensor (PHASE) Crankshaft position sensor (POS)	Engine speed	Heated oxygen sensor 1	Heated oxygen sensor 1 heater
Engine coolant temperature sensor	Engine coolant temperature	heater control	Treated oxygen sensor i freater

The ECM performs ON/OFF control of the heated oxygen sensor 1 heater corresponding to the engine speed and engine coolant temperature. The duty percent varies with engine coolant temperature when engine is started.

OPERATION

Engine speed rpm	Heated oxygen sensor 1 heater	
Above 3,600	OFF	
Below 3,600 after warming up	ON	

CONSULT-II Reference Value in Data Monitor Mode

ABS000NO

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
HO2S1 HTR (B1) HO2S1 HTR (B2)	Engine: After warming upEngine speed: Below 3,600 rpm	ON
(22)	• Engine speed: Above 3,600 rpm	OFF

On Board Diagnosis Logic

ABS0004V

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	
P0031 0031 (Bank 1)	(Bank 1) Heated oxygen sensor 1 heater sensor 1 heater range.		Harness or connectors (The heated oxygen sensor 1 heater circuit is	
P0051 0051 (Bank 2)	control circuit low	(An excessively low voltage signal is sent to ECM through the heated oxygen sensor 1 heater.)	open or shorted.) • Heater oxygen sensor 1 heater	
P0032 0032 (Bank 1)	Heated oxygen sensor 1 heater	The current amperage in the heated oxygen sensor 1 heater circuit is out of the normal range.	Harness or connectors (The heated oxygen sensor 1 heater circuit is	
P0052 0052 (Bank 2)	control circuit high	(An excessively high voltage signal is sent to ECM through the heated oxygen sensor 1 heater.)	shorted.) • Heater oxygen sensor 1 heater	

DTC P0031, P0032, P0051, P0052 HO2S1 HEATER

[TYPE 1]

DTC Confirmation Procedure

ABS0004W

NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

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

(P) WITH CONSULT-II

- 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" and select "DATA MONITOR" mode with CONSULT-II.
- 4. Start engine and run it for at least 6 seconds at idle speed.
- 5. If 1st trip DTC is detected, go to EC-159, "Diagnostic Procedure"

DATA MONITOR

MONITOR NO DTC

ENG SPEED XXXX rpm

SEF058Y

® 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. Start engine and run it for at least 6 seconds at idle speed.
- 4. Turn ignition switch "OFF" and wait at least 10 seconds.
- 5. Start engine and run it for at least 6 seconds at idle speed.
- 6. Select "MODE 3" with GST.
- If DTC is detected, go to <u>EC-159</u>, "<u>Diagnostic Procedure</u>".
- When using GST, "DTC Confirmation Procedure" should be performed twice as much as when using CONSULT-II because GST cannot display MODE 7 (1st trip DTC) concerning this diagnosis. Therefore, using CONSULT-II is recommended.

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Wiring Diagram BANK 1 ABS0004X EC-O2H1B1-01 IGNITION SWITCH ON OR START : DETECTABLE LINE FOR DTC : NON-DETECTABLE LINE FOR DTC FUSE BLOCK REFER TO PG-POWER. (J/B) 15 (M4) R/B 2 HEATED OXYGEN SENSOR 1 (BANK 1) R/B 10H R/B (F17) 4 3 (F102) L/W 2 JOINT CONNECTOR-4 (F107) 2 3 L/W 91 39 O2HFR ECM (F101) REFER TO THE FOLLOWING. 1 1 1 1 1 2 2 2 2 2 2 7 F107 P (F102) -SUPER MULTIPLE JUNCTION (SMJ) (M4) -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT0313E

58 59 60 61 62 63 64 65 66 67

68 69 70 71 72 73 74 75 76

77 78 79 80 81 82 83 84 85 86

87 88 89 90 91 92 93 94 95

1 2 3 4 5 6 7 8 9 10

11 12 13 14 15 16 17 18 19

20 21 22 23 24 25 26 27 28 29

39 40 41 42 43 44 45 46 47 48

49 50 51 52 53 54 55 56 57

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111 112

(F101)

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DTC P0031, P0032, P0051, P0052 HO2S1 HEATER

[TYPE 1]

Specification data are reference values and are measured between each terminal and ground. Pulse signal is measured by CONSULT-II.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
39	L	Heated oxygen sensor 1 heater (bank 1)	[Engine is running]Warm-up conditionEngine speed is below 3,600 rpm.	Approximately 7V★
			[Engine is running]	BATTERY VOLTAGE
			 Engine speed is above 3,600 rpm. 	(11 - 14V)

^{★:} Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

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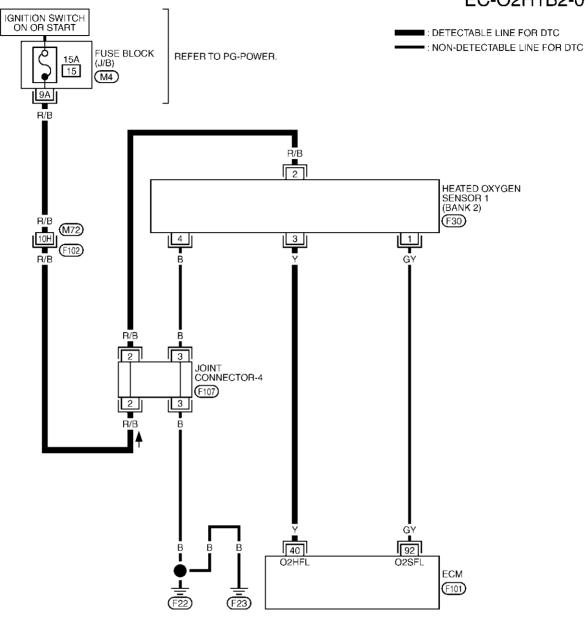
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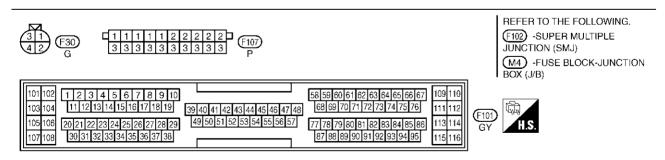
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BANK 2

EC-O2H1B2-01





TBWT0314E

DTC P0031, P0032, P0051, P0052 HO2S1 HEATER

[TYPE 1]

Specification data are reference values and are measured between each terminal and ground. Pulse signal is measured by CONSULT-II.

CAUTION:

Do not 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.

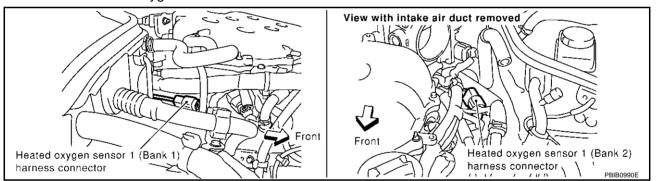
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
40	Y	Heated oxygen sensor 1 heater (bank 2)	[Engine is running]Warm-up conditionEngine speed is below 3,600 rpm.	Approximately 7V★
			[Engine is running] • Engine speed is above 3,600 rpm.	BATTERY VOLTAGE (11 - 14V)

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

1. CHECK HO2S1 POWER SUPPLY CIRCUIT

- 1. Turn ignition switch "OFF".
- Disconnect heated oxygen sensor 1 harness connector.

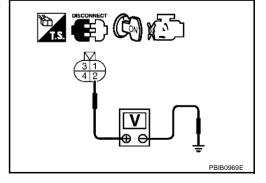


- 3. Turn ignition switch "ON".
- 4. Check voltage between HO2S1 terminal 2 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 3. NG >> GO TO 2.



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[TYPE 1]

$\overline{2}$. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M72, F102
- Fuse block (J/B) connector M4
- 15A fuse
- Joint connector-4
- Harness for open or short between heated oxygen sensor 1 and fuse
 - >> Repair harness or connectors.

3. CHECK HO2S1 OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch "OFF".
- 2. Disconnect ECM harness connector.
- Check harness continuity between ECM terminal and HO2S1 terminal as follows. Refer to Wiring Diagram.

DTC	Terminals		Bank
ыс	ECM	Sensor	Dank
P0031, P0032	39	3	1
P0051, P0052	40	3	2

Continuity should exist.

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

OK or NG

OK >> GO TO 4.

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

4. CHECK HEATED OXYGEN SENSOR 1 HEATER

Refer to EC-161, "Component Inspection".

OK or NG

OK >> GO TO 5.

NG >> Replace malfunctioning heated oxygen sensor 1.

5. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

DTC P0031, P0032, P0051, P0052 HO2S1 HEATER

[TYPE 1]

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Component Inspection HEATED OXYGEN SENSOR 1 HEATER

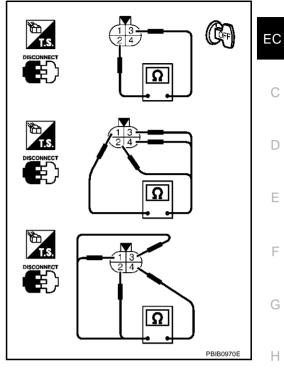
1. Check resistance between HO2S1 terminals as follows.

Terminal No.	Resistance
2 and 3	3.3 - 4.0 Ω at 25°C (77°F)
1 and 2, 3, 4	∞ Ω
4 and 1, 2, 3	(Continuity should not exist)

2. If NG, replace heated oxygen sensor 1.

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 tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.



Removal and Installation **HEATED OXYGEN SENSOR 1**

Refer to EM-24, "EXHAUST MANIFOLD AND THREE WAY CATALYST".

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DTC P0037, P0038, P0057, P0058 HO2S2 HEATER

[TYPE 1]

DTC P0037, P0038, P0057, P0058 HO2S2 HEATER

PFP:226A0

Description SYSTEM DESCRIPTION

ABS00051

Sensor	Input signal to ECM	ECM function	Actuator
Camshaft position sensor (PHASE)	Engine speed		
Crankshaft position sensor (POS)	Engine speed	Heated oxygen sensor 2 heater control	Heated oxygen sensor 2 heater
Engine coolant temperature sensor	Engine coolant temperature		
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 rpm	Heated oxygen sensor 2 heater
Above 3,600	OFF
Below 3,600 rpm after the following conditions are met.	
Engine: After warming up	ON
 Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load 	ON

CONSULT-II Reference Value in Data Monitor Mode

ABS000NP

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
	• Engine speed is below 3,600 rpm after the following conditions are met.	
LICOCO LITE (E4)	- Engine: After warming up	ON
HO2S2 HTR (B1) HO2S2 HTR (B2)	 Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load 	
	Engine speed: Above 3,600 rpm	OFF

On Board Diagnosis Logic

ABS00053

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	
P0037 0037 (Bank 1)	Heated oxygen sensor 2 heater sor 2 heater circuit is out of the normal range.		Harness or connectors (The heated oxygen sensor 2 heater circuit is	
P0057 0057 (Bank 2)	control circuit low	(An excessively low voltage signal is sent to ECM through the heated oxygen sensor 2 heater.)	open or shorted.) • Heater oxygen sensor 2 heater	
P0038 0038 (Bank 1)	Heated oxygen	The current amperage in the heated oxygen sensor 2 heater circuit is out of the normal range.	Harness or connectors (The heated oxygen sensor 2 heater circuit is	
P0058 0058 (Bank 2)	control circuit high	sor 2 heater trol circuit high (An excessively high voltage signal is sent to ECM through the heated oxygen sensor 2 heater.)	shorted.) • Heater oxygen sensor 2 heater	

DTC P0037, P0038, P0057, P0058 HO2S2 HEATER

[TYPE 1]

DTC Confirmation Procedure

ABS00054

NOTE:

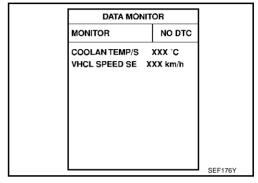
If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

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

(P) WITH CONSULT-II

- 1. Turn ignition switch "ON" and select "DATA MONITOR" mode with CONSULT-II.
- 2. Start engine and warm it up to the normal operating temperature.
- 3. Turn ignition switch "OFF" and wait at least 10 seconds.
- Start the engine and keep the engine speed between 3,500 rpm and 4,000 rpm for at least 1 minute under no load.
- 5. Let engine idle for 1 minute.
- 6. If 1st trip DTC is detected, go to EC-167, "Diagnostic Procedure"



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.
- 3. Start the engine and keep the engine speed between 3,500 rpm and 4,000 rpm for at least 1 minute under no load.
- 4. Let engine idle for 1 minute.
- Turn ignition switch "OFF" and wait at least 10 seconds.
- 6. Start the engine and keep the engine speed between 3,500 rpm and 4,000 rpm for at least 1 minute under no load.
- 7. Let engine idle for 1 minute.
- Select "MODE 3" with GST.
- 9. If DTC is detected, go to EC-167, "Diagnostic Procedure".
- When using GST, "DTC Confirmation Procedure" should be performed twice as much as when using CONSULT-II because GST cannot display MODE 7 (1st trip DTC) concerning this diagnosis. Therefore, using CONSULT-II is recommended.

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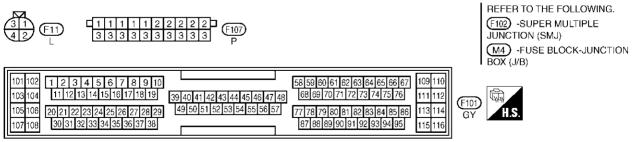
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DTC P0037, P0038, P0057, P0058 HO2S2 HEATER Wiring Diagram BANK 1 ABS00055 EC-O2H2B1-01 IGNITION SWITCH ON OR START : DETECTABLE LINE FOR DTC : NON-DETECTABLE LINE FOR DTC FUSE BLOCK REFER TO PG-POWER. (J/B) 15 (M4) R/B 2 HEATED OXYGEN SENSOR 2 (BANK 1) R/B 10H R/B (F11) 4 3 (F102) P/B W/R 2 JOINT CONNECTOR-4 (F107) 2 3 W/R 88 41 O2HRR O2SRR ECM (F101) REFER TO THE FOLLOWING. (F102) -SUPER MULTIPLE



TBWT0315E

DTC P0037, P0038, P0057, P0058 HO2S2 HEATER

[TYPE 1]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
			[Engine is running]	
		Heated oxygen sensor 2 heater (bank 1)	Engine speed is below 3,600 rpm after the following conditions are met.	
			- Engine: after warming up	0 - 1.0V
41	P/B		 Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load. 	
			[Ignition switch "ON"]	
			Engine stopped	BATTERY VOLTAGE
			[Engine is running]	(11 - 14V)
			 Engine speed is above 3,600 rpm. 	

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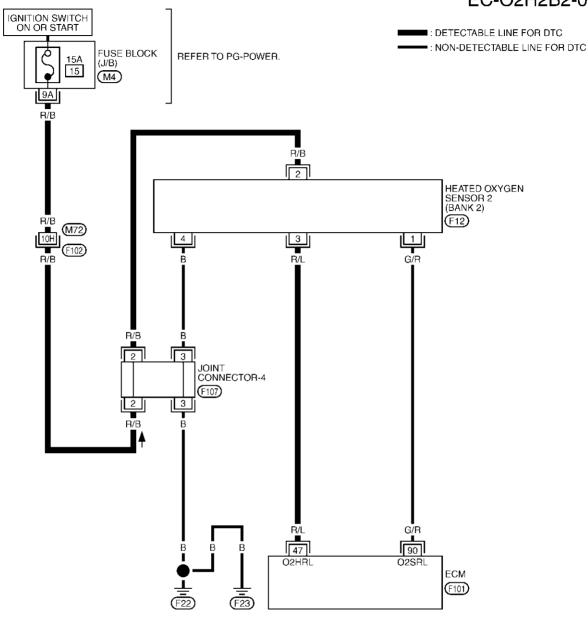
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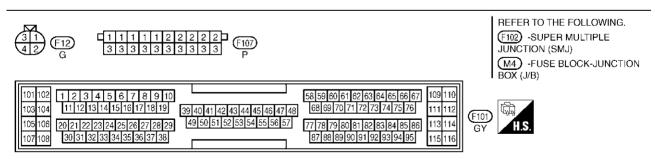
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BANK 2

EC-O2H2B2-01





TBWT0316E

DTC P0037, P0038, P0057, P0058 HO2S2 HEATER

[TYPE 1]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

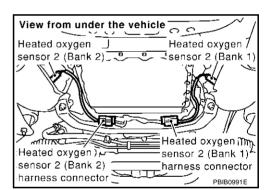
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)	EC
			[Engine is running]Engine speed is below 3,600 rpm after the following conditions are met.		С
47	R/L	Heated oxygen sensor 2 heater (bank 2)	 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 - 1.0V	D
			[Ignition switch "ON"] ● Engine stopped [Engine is running] ● Engine speed is above 3,600 rpm.	BATTERY VOLTAGE (11 - 14V)	F

Diagnostic Procedure

1. CHECK HO2S2 POWER SUPPLY CIRCUIT

- Turn ignition switch "OFF".
- Disconnect heated oxygen sensor 2 harness connector.

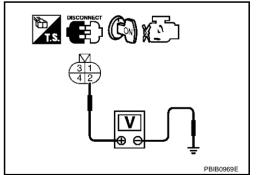


- Turn ignition switch "ON".
- Check voltage between HO2S2 terminal 2 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

>> GO TO 3. OK >> GO TO 2. NG



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ABS00056

[TYPE 1]

$\overline{2}$. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M72, F102
- Fuse block (J/B) connector M4
- 15A fuse
- Joint connector-4
- Harness for open or short between heated oxygen sensor 2 and fuse
 - >> Repair harness or connectors.

3. CHECK HO2S2 OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch "OFF".
- 2. Disconnect ECM harness connector.
- Check harness continuity between ECM terminal and HO2S2 terminal as follows.
 Refer to Wiring Diagram.

DTC	Term	Bank	
ыс	ECM	Sensor	Dank
P0037, P0038	41	3	1
P0057, P0058	47	3	2

Continuity should exist.

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

OK or NG

OK >> GO TO 4.

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

4. CHECK HEATED OXYGEN SENSOR 2 HEATER

Refer to EC-169, "Component Inspection".

OK or NG

OK >> GO TO 5.

NG >> Replace malfunctioning heated oxygen sensor 2.

5. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

DTC P0037, P0038, P0057, P0058 HO2S2 HEATER

[TYPE 1]

ABS00057

Component Inspection HEATED OXYGEN SENSOR 2 HEATER

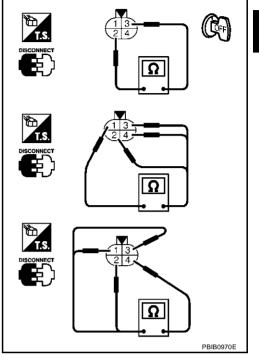
1. Check resistance between HO2S2 terminals as follows.

Terminal No.	Resistance
2 and 3	5.0 - 7.0 Ω at 25°C (77°F)
1 and 2, 3, 4	∞ Ω
4 and 1, 2, 3	(Continuity should not exist)

2. If NG, replace 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 tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.



Removal and Installation HEATED OXYGEN SENSOR 2

Refer to EM-24, "EXHAUST MANIFOLD AND THREE WAY CATALYST".

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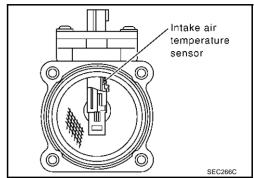
DTC P0101 MAF SENSOR

PFP:22680

Component Description

ABS00059

The mass air flow sensor is placed in the stream of intake air. It measures the intake flow rate by measuring a part of the entire intake flow. It consists of a hot film that is supplied with electric current from the ECM. The temperature of the hot film is controlled by the ECM a certain amount. The heat generated by the hot film is reduced as the intake air flows around it. The more air, the greater the heat loss. Therefore, the ECM must supply more electric current to maintain the temperature of the hot film as air flow increases. The ECM detects the air flow by means of this current change.



CONSULT-II Reference Value in Data Monitor Mode

ARS0005A

Specification data are reference values.

MONITOR ITEM	CC	NDITION	SPECIFICATION
	Engine: After warming up	Idle	Approx. 1.1 - 1.5V
MAS A/F SE-B1	Air conditioner switch: OFF		
WAS AT SE-BT	Shift lever: N	2,500 rpm	Approx. 1.7 - 2.4V
	No-load		
	Engine: After warming up	Idle	10% - 35%
CAL/LD VALUE	Shift lever: N		
ONLIED VALUE	Air conditioner switch: OFF	2,500 rpm	10% - 35%
	No-load		
	Engine: After warming up	Idle	2.0 - 6.0 g·m/s
MASS AIRFLOW	Shift lever: N		
WINCO / WITH LOVY	Air conditioner switch: OFF	2,500 rpm	7.0 - 20.0 g·m/s
	No-load		

On Board Diagnosis Logic

ABS0005B

This self-diagnosis has the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition		Possible cause
P0101 0101	Mass air flow sensor circuit range/performance problem	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
		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

DTC Confirmation Procedure

ABS0005C

Perform "PROCEDURE FOR MALFUNCTION A" first.

If the DTC cannot be confirmed, perform "PROCEDURE FOR MALFUNCTION B".

NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

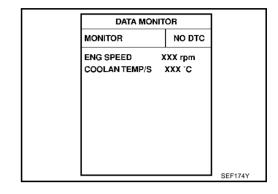
PROCEDURE FOR MALFUNCTION A

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.

(P) With CONSULT-II

- 1. Turn ignition switch "ON".
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- 3. Start engine and warm it up to normal operating temperature.
- 4. Run engine for at least 10 seconds at idle speed.
- 5. If DTC is detected, go to EC-174, "Diagnostic Procedure".



® With GST

Follow the procedure "With CONSULT-II" above.

PROCEDURE FOR MALFUNCTION B

CAUTION:

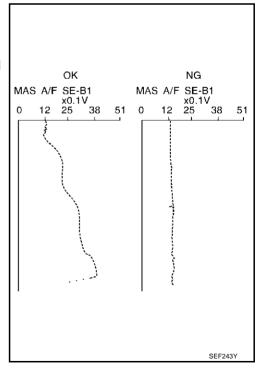
Always drive vehicle at a safe speed.

(With CONSULT-II

- 1. Turn ignition switch "ON".
- 2. Start engine and warm it up to normal operating temperature.

 If engine cannot be started, go to EC-174, "Diagnostic Procedure".
- 3. Select "DATA MONITOR" mode with CONSULT-II.
- 4. Check the voltage of "MAS A/F SE-B1" with "DATA MONITOR".
- 5. Increases engine speed to about 4,000 rpm.
- 6. Monitor the linear voltage rise in response to engine speed increases.

If NG, go to $\underline{\text{EC-}174}$, "Diagnostic Procedure" . If OK, go to following step.



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Maintain the following conditions for at least 10 consecutive seconds.

ENG SPEED	More than 2,000 rpm
	· '
THRTL SEN 1	More than 3V
-	
THRTL SEN 2	More than 3V
Selector lever	Suitable position
Ocicciói icvei	Outlable position
Driving location	Driving vehicle uphill (Increased engine load) will help maintain the driving conditions required for this test.

DATA MONITOR		
MONITOR	NO DTC	
ENG SPEED VHCL SPEED SE THRTL SEN 1 THRTL SEN 2	XXX rpm XXX km/h XXX V XXX V	
		PBIB019

8. If DTC is detected, go to EC-174, "Diagnostic Procedure".

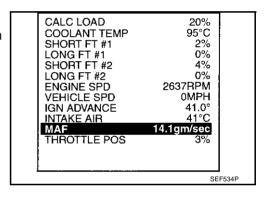
Overall Function Check PROCEDURE FOR MALFUNCTION B

ABS0005D

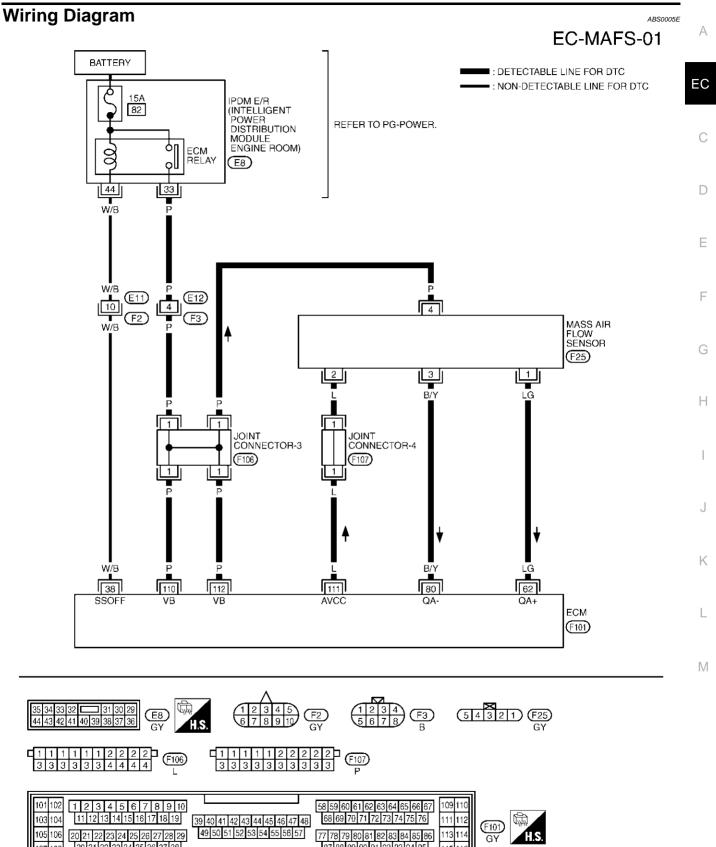
Use this procedure to check the overall function of the mass air flow sensor circuit. During this check, a DTC might not be confirmed.

With GST

- 1. Start engine and warm it up to normal operating temperature.
- 2. Select "MODE 1" with GST.
- 3. Check the mass air flow sensor signal with "MODE 1".
- 4. Check for linear mass air flow sensor signal value rise in response to increases to about 4,000 rpm in engine speed.
- 5. If NG, go to EC-174, "Diagnostic Procedure".



[TYPE 1]



TBWT0138E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
38	W/B	ECM relay	[Engine is running] [Ignition switch "OFF"] ● For a few seconds after turning ignition switch "OFF"	0 - 1.5V
		(Self shut-off)	[Ignition switch "OFF"]	BATTERY VOLTAGE
			 A few seconds passed after turning ignition switch "OFF" 	(11 - 14V)
	LG	LG Mass air flow sensor	[Engine is running]	
			Warm-up condition	1.1 - 1.5V
62			Idle speed	
02			[Engine is running]	
			Warm-up condition	1.7 - 2.4V
			• Engine speed is 2,500 rpm.	
			[Engine is running]	
80	B/Y	/Y Mass air flow sensor ground	Warm-up condition	Approximately 0V
			• Idle speed	
110 112	P P	Power supply for ECM	[Ignition switch "ON"]	BATTERY VOLTAGE (11 - 14V)
111	L	Sensors' power supply	[Ignition switch "ON"]	Approximately 5V

Diagnostic Procedure

ABS0005F

1. INSPECTION START

Which malfunction (A or B) is duplicated?

A or B

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 to intake manifold

OK or NG

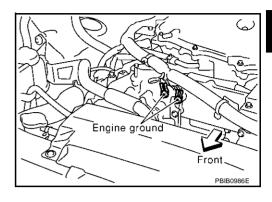
OK >> GO TO 3.

NG >> Reconnect the parts.

3. RETIGHTEN GROUND SCREWS

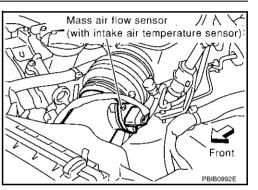
- 1. Turn ignition switch "OFF".
- 2. Loosen and retighten engine ground screws.

>> GO TO 4.



4. CHECK MAF SENSOR POWER SUPPLY CIRCUIT

- 1. Disconnect mass air flow (MAF) sensor harness connector.
- 2. Turn ignition switch "ON".

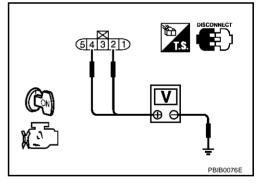


3. Check voltage between MAF sensor terminals 2, 4 and ground with CONSULT-II or tester.

Terminal	Voltage
2	Approximately 5V
4	Battery voltage

OK or NG

OK >> GO TO 6. NG >> GO TO 5.



5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Joint connector-3
- Joint connector-4
- Harness for open or short between IPDM E/R and mass air flow sensor
- Harness for open or short between mass air flow sensor and ECM
 - >> Repair harness or connectors.

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6. CHECK MAF SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch "OFF".
- 2. Disconnect ECM harness connector.
- Check harness continuity between MAF sensor terminal 3 and ECM terminal 80. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 7.

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

7. CHECK MAF SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between MAF sensor terminal 1 and ECM terminal 62. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 8.

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

8. CHECK MASS AIR FLOW SENSOR

Refer to EC-176, "Component Inspection".

OK or NG

OK >> GO TO 9.

NG >> Replace mass air flow sensor.

9. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

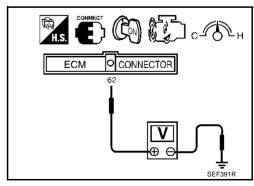
>> INSPECTION END

Component Inspection MASS AIR FLOW SENSOR

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- 1. Reconnect all harness connectors disconnected.
- 2. Start engine and warm it up to normal operating temperature.
- Check voltage between ECM terminal 62 (Mass air flow sensor signal) and ground.

Condition	Voltage V
Ignition switch "ON" (Engine stopped.)	Approx. 1.0
Idle (Engine is warmed-up to normal operating temperature.)	1.1 - 1.5
2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.7 - 2.4
Idle to about 4,000 rpm*	1.1 - 1.5 to Approx. 4.0



- *: Check for linear voltage rise in response to engine being increased to about 4,000 rpm.
- If the voltage is out of specification, proceed the following.
 - Turn ignition switch "OFF".
 - Disconnect mass air flow sensor harness connector and reconnect it again.

DTC P0101 MAF SENSOR

[TYPE 1]

- Perform steps 2 and 3 again.
- 5. If NG, remove mass air flow sensor from air duct. Check hot film for damage or dust.
- 6. If NG, clean or replace mass air flow sensor.

Removal and Installation MASS AIR FLOW SENSOR

Refer to EM-16, "AIR CLEANER AND AIR DUCT".

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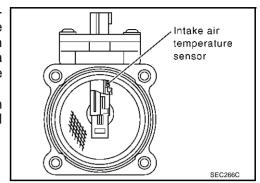
DTC P0102, P0103 MAF SENSOR

Component Description

PFP:22680

ABS00051

The mass air flow sensor is placed in the stream of intake air. It measures the intake flow rate by measuring a part of the entire intake flow. It consists of a hot film that is supplied with electric current from the ECM. The temperature of the hot film is controlled by the ECM a certain amount. The heat generated by the hot film is reduced as the intake air flows around it. The more air, the greater the heat loss. Therefore, the ECM must supply more electric current to maintain the temperature of the hot film as air flow increases. The ECM detects the air flow by means of this current change.



CONSULT-II Reference Value in Data Monitor Mode

ABS000NQ

Specification data are reference values.

MONITOR ITEM	CON	NDITION	SPECIFICATION
	Engine: After warming up	Idle	Approx. 1.1 - 1.5V
MAS A/F SE-B1	Air conditioner switch: OFF		
MAS AT SE-BT	Shift lever: N	2,500 rpm	Approx. 1.7 - 2.4V
	No-load		
	Engine: After warming up	Idle	10% - 35%
CAL/LD VALUE	Shift lever: N		
ONL/LD VALUE	Air conditioner switch: OFF	2,500 rpm	10% - 35%
	No-load		
	Engine: After warming up	Idle	2.0 - 6.0 g·m/s
MASS AIRFLOW	Shift lever: N		
W/NOO / NINI LOW	Air conditioner switch: OFF	2,500 rpm	7.0 - 20.0 g·m/s
	No-load		

On Board Diagnosis Logic

ABS0005K

These self-diagnoses have the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0102 0102	Mass air flow 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.) Intake air leaks Mass air flow sensor
P0103 0103	Mass air flow 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.) Mass air flow sensor

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode and the MIL lights up.

Detected items	Engine operating condition in fail-safe mode	
Mass air flow sensor circuit	Engine speed will not rise more than 2,400 rpm due to the fuel cut.	

DTC P0102, P0103 MAF SENSOR

[TYPE 1]

DTC Confirmation Procedure

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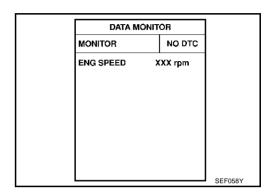
NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

PROCEDURE FOR DTC P0102

(A) With CONSULT-II

- 1. Turn ignition switch "ON".
- Select "DATA MONITOR" mode with CONSULT-II.
- 3. Start engine and wait at least 5 seconds.
- 4. If DTC is detected, go to EC-181, "Diagnostic Procedure".



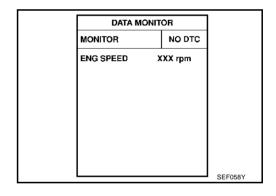
® With GST

Follow the procedure "With CONSULT-II" above.

PROCEDURE FOR DTC P0103

(With CONSULT-II

- 1. Turn ignition switch "ON".
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- Wait at least 5 seconds.
- If DTC is detected, go to <u>EC-181</u>, "<u>Diagnostic Procedure</u>".
 If DTC is not detected, go to next step.
- 5. Start engine and wait at least 5 seconds.
- If DTC is detected, go to <u>EC-181, "Diagnostic Procedure"</u>.



With GST

Follow the procedure "With CONSULT-II" above.

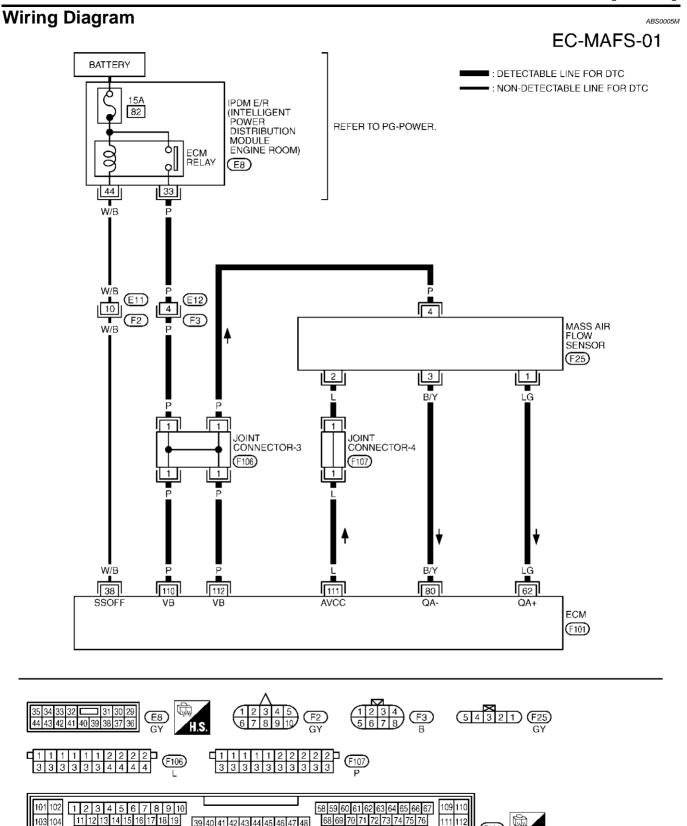
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(F101)

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49 50 51 52 53 54 55 56 57

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20 21 22 23 24 25 26 27 28 29

DTC P0102, P0103 MAF SENSOR

[TYPE 1]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

		-		
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
38 W/B	W/B	ECM relay (Self shut-off)	[Engine is running][Ignition switch "OFF"]For a few seconds after turning ignition switch "OFF"	0 - 1.5V
			[Ignition switch "OFF"] ● A few seconds passed after turning ignition switch "OFF"	BATTERY VOLTAGE (11 - 14V)
62 LG	LG	Mass air flow sensor	[Engine is running] • Warm-up condition • Idle speed	1.1 - 1.5V
02 13			[Engine is running]Warm-up conditionEngine speed is 2,500 rpm.	1.7 - 2.4V
80	В/Ү	Mass air flow sensor ground	[Engine is running]Warm-up conditionIdle speed	Approximately 0V
110 112	P P	Power supply for ECM	[Ignition switch "ON"]	BATTERY VOLTAGE (11 - 14V)
111	L	Sensors' power supply	[Ignition switch "ON"]	Approximately 5V

Diagnostic Procedure

1. INSPECTION START

Which malfunction (P0102 or P0103) is duplicated?

P0102 or P0103

P0102 >> GO TO 2.

P0103 >> 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

OK or NG

OK >> GO TO 3.

NG >> Reconnect the parts. D

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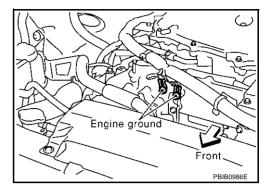
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ABS0005N

$\overline{3}$. RETIGHTEN GROUND SCREWS

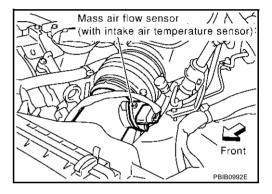
- 1. Turn ignition switch "OFF".
- 2. Loosen and retighten engine ground screws.

>> GO TO 4.



4. CHECK MAF SENSOR POWER SUPPLY CIRCUIT

- 1. Disconnect MAF sensor harness connector.
- 2. Turn ignition switch "ON".

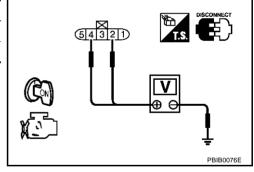


3. Check voltage between MAF sensor terminals 2, 4 and ground with CONSULT-II or tester.

Terminal	Voltage
2	Approximately 5V
4	Battery voltage

OK or NG

OK >> GO TO 6. NG >> GO TO 5.



5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Joint connector-3
- Joint connector-4
- Harness for open or short between IPDM E/R relay and mass air flow sensor
- Harness for open or short between mass air flow sensor and ECM

>> Repair harness or connectors.

DTC P0102, P0103 MAF SENSOR

[TYPE 1]

		[11661]
6.	CHECK MAF SENSOR GROUND CIRCUIT FOR OPEN AND SHORT	
1.	Turn ignition switch "OFF".	
2.	Disconnect ECM harness connector.	
3.	Check harness continuity between MAF sensor terminal 3 and ECM terminal 80. Refer to Wiring Diagram.	
	Continuity should exist.	
4. OK	Also check harness for short to ground and short to power. or NG	
0 N		
7.	CHECK MAF SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT	
1.	Check harness continuity between MAF sensor terminal 1 and ECM terminal 62. Refer to Wiring Diagram.	
	Continuity should exist.	
2. OK	Also check harness for short to ground and short to power. or NG	
0		
N	S >> Repair open circuit or short to ground or short to power in harness or connectors.	
8.	CHECK MASS AIR FLOW SENSOR	
Re	fer to EC-184, "Component Inspection".	
<u>OK</u>	or NG	
	K >> GO TO 9.	
N	·	
9.	CHECK INTERMITTENT INCIDENT	
Re	fer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .	
	>> INSPECTION END	

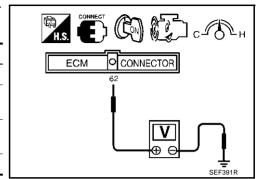
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Component Inspection MASS AIR FLOW SENSOR

ABS00050

- Reconnect harness connectors disconnected.
- 2. Start engine and warm it up to normal operating temperature.
- Check voltage between ECM terminal 62 (Mass air flow sensor signal) and ground.

Condition	Voltage V
Ignition switch "ON" (Engine stopped.)	Approx. 1.0
Idle (Engine is warmed-up to normal operating temperature.)	1.1 - 1.5
2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.7 - 2.4
Idle to about 4,000 rpm*	1.1 - 1.5 to Approx. 4.0



^{*:} Check for linear voltage rise in response to engine being increased to about 4,000 rpm.

- 4. If the voltage is out of specification, proceed the following.
 - Turn ignition switch "OFF".
 - Disconnect mass air flow sensor harness connector and reconnect it again.
 - Perform steps 2 and 3 again.
- 5. If NG, remove mass air flow sensor from air duct. Check hot film for damage or dust.
- 6. If NG, clean or replace mass air flow sensor.

Removal and Installation MASS AIR FLOW SENSOR

ABS0005P

Refer to EM-16, "AIR CLEANER AND AIR DUCT".

[TYPE 1]

DTC P0112, P0113 IAT SENSOR

PFP:22630

Component Description

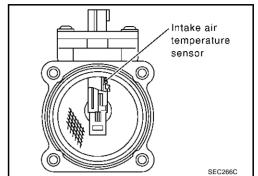
ABS0005Q

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EC

The intake air temperature sensor is built-into mass air flow sensor. The sensor detects intake air temperature and transmits a signal to the ECM.

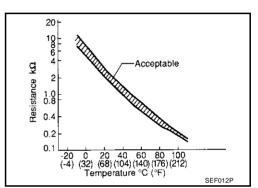
The temperature sensing unit uses a thermistor which is sensitive to the change in temperature. Electrical resistance of the thermistor decreases in response to the temperature rise.



<Reference data>

Intake air temperature °C (°F)	Voltage* V	Resistance kΩ
25 (77)	3.32	1.9 - 2.1
80 (176)	1.23	0.31 - 0.37

^{*:} These data are reference values and are measured between ECM terminal 66 (Intake air temperature sensor) and ground.



CAUTION:

Do not 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.

On Board Diagnosis Logic

ABS0005R

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DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	
P0112 0112	Intake air 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.)	
P0113 0113	Intake air tempera- ture sensor circuit high input	An excessively high voltage from the sensor is sent to ECM.	Intake air temperature sensor	

DTC Confirmation Procedure

ABS0005S

NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

(P) WITH CONSULT-II

- 1. Turn ignition switch "ON".
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- 3. Wait at least 5 seconds.
- 4. If 1st trip DTC is detected, go to EC-188, "Diagnostic Procedure"

DATA MONITOR

MONITOR NO DTC

ENG SPEED XXX rpm

SEF058Y

	SEF058Y
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DTC P0112, P0113 IAT SENSOR

[TYPE 1]

WITH GST

Follow the procedure "With CONSULT-II" above.

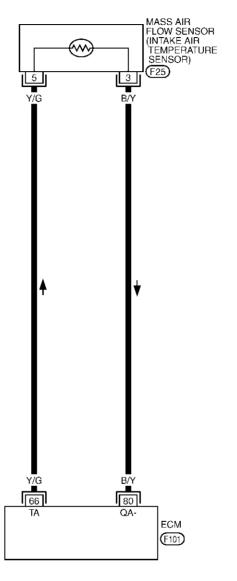
[TYPE 1]

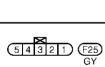
Wiring Diagram

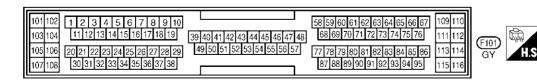
EC-IATS-01

: DETECTABLE LINE FOR DTC

■: NON-DETECTABLE LINE FOR DTC







TBWT0139E

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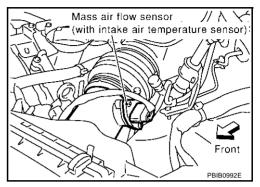
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Diagnostic Procedure

ABS0005U

1. CHECK INTAKE AIR TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

- 1. Turn ignition switch "OFF".
- 2. Disconnect mass air flow sensor (intake air temperature sensor is built-into) harness connector.
- 3. Turn ignition switch "ON".



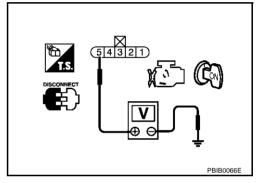
4. Check voltage between mass air flow sensor terminal 5 and ground.

Voltage: Approximately 5V

OK or NG

OK >> GO TO 2.

NG >> Repair harness or connectors.



2. CHECK INTAKE AIR TEMPERATURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch "OFF".
- 2. Disconnect ECM.
- Check harness continuity between mass air flow sensor terminal 3 and ECM 80. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 3.

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

3. CHECK INTAKE AIR TEMPERATURE SENSOR

Refer to EC-189, "Component Inspection".

OK or NG

OK >> GO TO 4.

NG >> Replace mass air flow sensor (with intake air temperature sensor).

4. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

DTC P0112, P0113 IAT SENSOR

[TYPE 1]

Component Inspection INTAKE AIR TEMPERATURE SENSOR

BS0005V

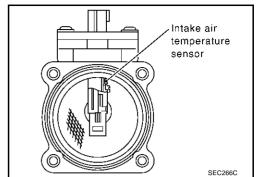
Α

EC

1. Check resistance between mass air flow sensor terminals 3 and 5 under the following conditions.

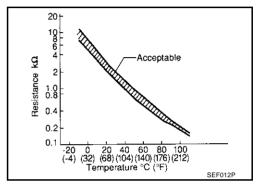
Intake air temperature °C (°F)	Resistance kΩ
25 (77)	1.9 - 2.1

2. If NG, replace mass air flow sensor (with intake air temperature sensor).



Removal and Installation MASS AIR FLOW SENSOR

ABS0005W



Refer to EM-16, "AIR CLEANER AND AIR DUCT".

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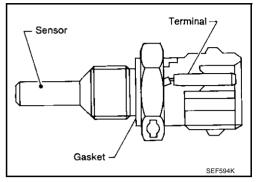
DTC P0117, P0118 ECT SENSOR

PFP:22630

Component Description

ABS0005X

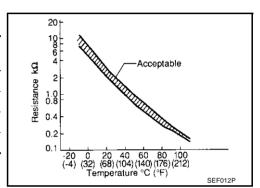
The engine coolant temperature sensor is used to detect the engine coolant temperature. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the engine coolant temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.



<Reference data>

Engine coolant temperature °C (°F)	Voltage* V	Resistance k Ω
-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

^{*:} These data are reference values and are measured between ECM terminal 93 (Engine coolant temperature sensor) and ground.



CAUTION:

Do not 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.

On Board Diagnosis Logic

ABS0005Y

These self-diagnoses have the one trip detection logic.

DTC No.	Trouble Diagnosis Name	DTC Detecting Condition	Possible Cause	
P0117 0117	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 0118	Engine coolant tem- perature sensor cir- cuit high input	An excessively high voltage from the sensor is sent to ECM.	, , ,	

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters in fail-safe mode and the MIL lights up.

Detected items	Engine operating condition in fail-safe mode		
	Engine coolant temperature will be determined by ECM based on the time after turning ignition switch "ON" or "START". CONSULT-II displays the engine coolant temperature decided by ECM.		
	Condition	Engine coolant temperature decided (CONSULT-II display)	
Engine coolant temper-	Just as ignition switch is turned ON or Start	40°C (104°F)	
ature sensor circuit	More than approx. 4 minutes after ignition ON or Start	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 tempera while engine is running.	ature sensor is activated, the cooling fan operates	

DTC P0117, P0118 ECT SENSOR

[TYPE 1]

DTC Confirmation Procedure

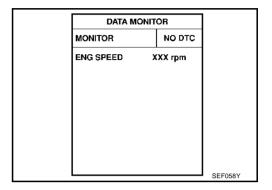
BS0005Z

NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

(P) WITH CONSULT-II

- 1. Turn ignition switch "ON".
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- 3. Wait at least 5 seconds.
- 4. If DTC is detected, go to EC-193, "Diagnostic Procedure".



WITH GST

Follow the procedure "WITH CONSULT-II" above.

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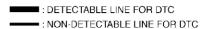
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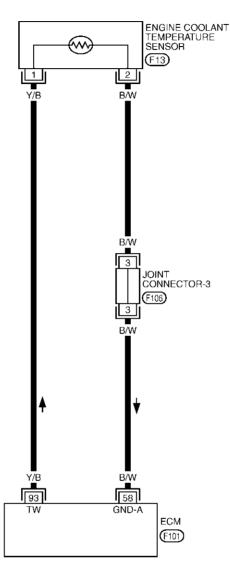
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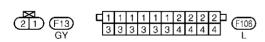
Wiring Diagram

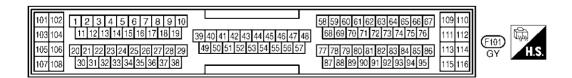
PSOOOEO

EC-ECTS-01









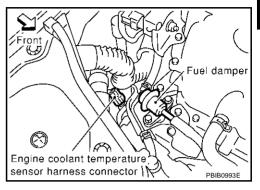
TBWT0140E

[TYPE 1]

Diagnostic Procedure

1. CHECK ECT SENSOR POWER SUPPLY CIRCUIT

- 1. Turn ignition switch "OFF".
- 2. Disconnect engine coolant temperature (ECT) sensor harness connector.
- 3. Turn ignition switch "ON".



4. Check voltage between ECT sensor terminal 1 and ground with CONSULT-II or tester.

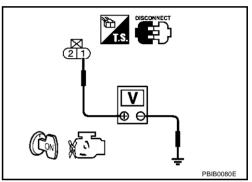
Voltage: Approximately 5V

OK or NG

OK >> GO TO 2.

NG >> Repair op

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



2. CHECK ECT SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch "OFF".

Check harness continuity between ECT sensor terminal 2 and engine ground. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 4.

NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-3
- Harness for open and short between ECT sensor and ECM
 - >> Repair open circuit or short to power in harness or connectors.

4. CHECK ENGINE COOLANT TEMPERATURE SENSOR

Refer to EC-194, "Component Inspection".

OK or NG

OK >> GO TO 5.

NG >> Replace engine coolant temperature sensor.

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5. CHECK INTERMITTENT INCIDENT

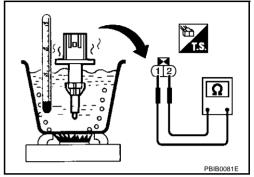
Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

Component Inspection ENGINE COOLANT TEMPERATURE SENSOR

ABS00062

1. Check resistance between engine coolant temperature sensor terminals 1 and 2 as shown in the figure.



<Reference data>

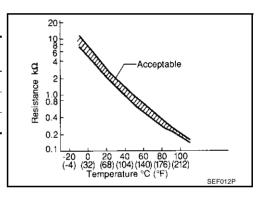
Engine coolant temperature °C (°F)	Voltage* V	Resistance k Ω
20 (68)	3.5	2.1 - 2.9
50 (122)	2.2	0.68 - 1.00
90 (194)	0.9	0.236 - 0.260

^{*:} These data are reference values and are measured between ECM terminal 93 (Engine coolant temperature sensor) and ground.

2. If NG, replace engine coolant temperature sensor.

Removal and Installation ENGINE COOLANT TEMPERATURE SENSOR





ABS00063

DTC P0121 TP SENSOR

PFP:16119

Component Description

ABS000JW

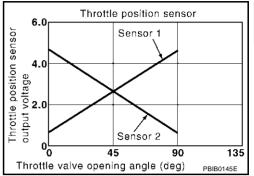
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Electric Throttle Control Actuator consists of throttle control motor, throttle position sensor, etc. The throttle position sensor responds to the throttle valve movement.

The throttle position sensor has the 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.



CONSULT-II Reference Value in Data Monitor Mode

ABS000NR

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
THRTL SEN1 THRTL SEN2*	• Ignition switch: ON	Accelerator pedal: Fully released	More than 0.36V
	(Engine stopped) ■ Shift lever: D	Accelerator pedal: Fully depressed	Less than 4.75V

^{*:} Throttle position sensor 2 signal is converted by ECM internally. Thus, it differs from ECM terminal voltage signal.

On Board Diagnosis Logic

ABS000NI

This self-diagnosis has the one trip detection logic.

DTC No.	Trouble diagnosis name		DTC detecting condition	Check Items (Possible Cause)
		A)	A high voltage from the sensor is sent to ECM under light load driving condition.	Harness or connectors (The TP sensor 1 and 2 circuit is open or shorted.)
				Electric throttle control actuator (TP sensor 1 and 2)
	Throttle position sen-			Fuel injector
P0121	sor circuit range/perfor-			Camshaft position sensor (PHASE)
0121	mance problem			Mass air flow sensor
		B)	A low voltage from the sensor is sent to ECM under heavy load driving condition.	Harness or connectors (The TP sensor circuit is open or shorted.)
				Electric throttle control actuator (TP sensor 1 and 2)
				Intake air leaks

DTC Confirmation Procedure

ABS000OK

If DTC P0121 is detected, perform "PROCEDURE FOR MALFUNCTION A" first. If there is no problem on "PROCEDURE FOR MALFUNCTION A", perform "PROCEDURE FOR MALFUNCTION B".

NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

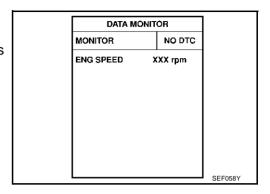
PROCEDURE FOR MALFUNCTION A

(P) With CONSULT-II

- 1. Turn ignition switch "ON".
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- 3. Start engine and let it idle for at least 10 seconds. If idle speed is over 1,000 rpm, maintain the following conditions for at least 10 seconds to keep engine speed below 1,000 rpm.

Selector lever	Suitable position except "P" or "N" position	
Brake pedal	Depressed	
Vehicle speed	0 km/h (0 MPH)	

4. If DTC is detected, go to EC-198, "Diagnostic Procedure".



With GST

Follow the procedure "With CONSULT-II" above.

PROCEDURE FOR MALFUNCTION B

CAUTION:

Always drive vehicle at a safe speed.

(P) With CONSULT-II

- 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. Select "AUTO TRIG" in "DATA MONITOR" mode with CONSULT-II.
- 5. Maintain the following conditions for at least 10 consecutive seconds.

ENG SPEED	More than 2,000 rpm
MAS A/F SE-B1	More than 3V
COOLAN TEMP/S	More than 70°C (158°F)
Selector lever	Suitable position
Driving location	Driving vehicle uphill (Increased engine load) will help maintain the driving conditions required for this test.

DATA MONITOR

MONITOR

NO DTC

ENG SPEED XXX rpm
MAS A/F SE-B1 XXX V

COOLAN TEMP/S XXX C

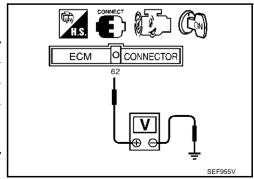
6. If DTC is detected, go to EC-198, "Diagnostic Procedure".

With GST

1. Maintain the following conditions for at least 10 consecutive seconds.

Gear position	Suitable position
	· ·
Engine speed	More than 2,000 rpm
Engine coolant temperature	More than 70°C (158°F)
Voltage between ECM terminal 62 (Mass air flow sensor signal) and ground	More than 3V

If DTC is detected, go to <u>EC-198, "Diagnostic Procedure"</u>.



Wiring Diagram

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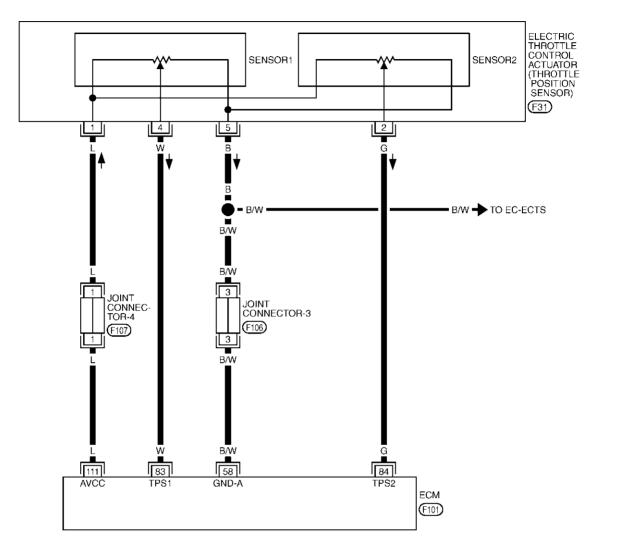
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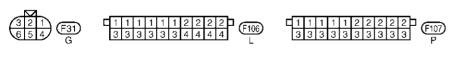
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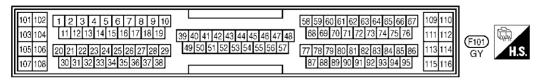
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EC-TPS3-01

■ : DETECTABLE LINE FOR DTC : NON-DETECTABLE LINE FOR DTC







TBWT0148E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
			[Engine is running]	
58	B/W	Sensors' ground	Warm-up condition	Approximately 0V
			Idle speed	
			[Ignition switch "ON"]	
			Engine stopped	More than 0.36V
			Gear position: "D"	Wore than 0.36V
00	147	Throttle position sensor 1	Accelerator pedal fully released	
83	W		[Ignition switch "ON"]	
			Engine stopped	
			Gear position: "D"	Less than 4.75V
			Accelerator pedal fully depressed	
			[Ignition switch "ON"]	
			Engine stopped	
			Gear position: "D"	Less than 4.75V
84 G	Throttle position sensor 2	Accelerator pedal fully released		
		[Ignition switch "ON"]		
		Engine stopped	M (1 0 00)/	
		Gear position: "D"	More than 0.36V	
			Accelerator pedal fully depressed	
111	L	Sensors' power supply	[Ignition switch "ON"]	Approximately 5V

Diagnostic Procedure

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1. INSPECTION START

Which malfunction (A or B) is duplicated?

Malfunction A or B

Malfunction A>>GO TO 4.

Malfunction B>>GO TO 2.

2. PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Perform EC-51, "Throttle Valve Closed Position Learning".

>> GO TO 3.

3. CHECK INTAKE SYSTEM

Check the following connections.

- Air duct
- Vacuum hoses
- Intake air passage between air duct to intake manifold collector

OK or NG

OK >> GO TO 4.

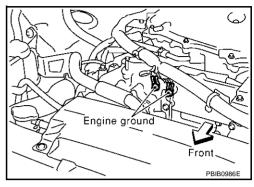
NG >> Reconnect the parts.

Revision; 2004 April EC-198 2003 G35 Sedan

4. RETIGHTEN GROUND SCREWS

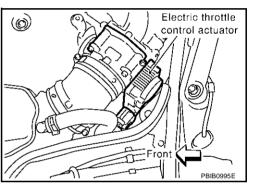
- 1. Turn ignition switch "OFF".
- 2. Loosen and retighten engine ground screws.

>> GO TO 5.



5. CHECK THROTTLE POSITION SENSOR POWER SUPPLY CIRCUIT

- Disconnect electric throttle control actuator harness connector.
- 2. Turn ignition switch "ON".

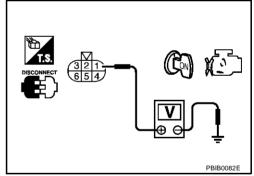


3. Check voltage between electric throttle control actuator terminal 1 and ground with CONSULT-II or tester.

Voltage: Approximately 5V

OK or NG

OK >> GO TO 7. NG >> GO TO 6.



6. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-4
- Harness for open or short between electric throttle control actuator and ECM
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

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7. CHECK THROTTLE POSITION SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch "OFF".
- 2. Check harness continuity between electric throttle control actuator terminal 5 and engine ground. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 9. NG >> GO TO 8.

8. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-3
- Harness for open or short between electric throttle control actuator and ECM
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

9. CHECK THROTTLE POSITION SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Disconnect ECM harness connector.
- Check harness continuity between ECM terminal 83 and electric throttle control actuator terminal 4, ECM terminal 84 and electric throttle control actuator terminal 2.
 Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 10.

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

10. CHECK THROTTLE POSITION SENSOR

Refer to EC-295, "Component Inspection".

OK or NG

OK (Malfunction A in step1)>>GO TO 12.

OK (Malfunction B in step1)>>GO TO 15.

NG >> GO TO 11.

11. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

- 1. Replace the electric throttle control actuator.
- 2. Perform EC-51, "Throttle Valve Closed Position Learning".
- 3. Perform EC-51, "Idle Air Volume Learning".

>> INSPECTION END

12. CHECK MASS AIR FLOW SENSOR

Refer to EC-176, "Component Inspection".

OK or NG

OK >> GO TO 13.

NG >> Replace mass air flow sensor.

DTC P0121 TP SENSOR

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	[TYPE 1]
13. CHECK CAMSHAFT POSITION SENSOR (PHASE)	
Refer to EC-341, "Component Inspection" . OK or NG OK >> GO TO 14. NG >> Replace camshaft position sensor (PHASE).	
14. CHECK FUEL INJECTOR	
Refer to EC-606, "Component Inspection" . OK or NG OK >> GO TO 15. NG >> Replace fuel injector.	
15. CHECK INTERMITTENT INCIDENT	
Perform EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".	
>> INSPECTION END	

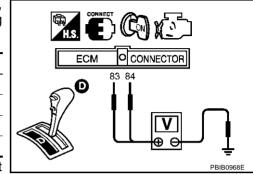
Revision; 2004 April EC-201 2003 G35 Sedan

Component Inspection THROTTLE POSITION SENSOR

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- Reconnect all harness connectors disconnected.
- 2. Perform EC-51, "Throttle Valve Closed Position Learning".
- 3. Turn ignition switch "ON".
- 4. Set selector lever to "D" position.
- Check voltage between ECM terminals 83 (TP sensor 1 signal), 84 (TP sensor 2 signal) and engine ground under the following conditions.

Terminal	Accelerator pedal	Voltage
83	Fully released	More than 0.36V
(Throttle position sensor 1)	Fully depressed	Less than 4.75V
84	Fully released	Less than 4.75V
(Throttle position sensor 2)	Fully depressed	More than 0.36V



- 6. If NG, replace electric throttle control actuator and go to the next step.
- 7. Perform EC-51, "Throttle Valve Closed Position Learning".
- 8. Perform EC-51, "Idle Air Volume Learning".

Removal and Installation ELECTRIC THROTTLE CONTROL ACTUATOR

Refer to EM-18, "INTAKE MANIFOLD COLLECTOR".

ABS000K3

DTC P0122, P0123 TP SENSOR

[TYPE 1]

DTC P0122, P0123 TP SENSOR

PFP:16119

Description

ABS000NG

DTC P0122 or P0123 is displayed with other DTC. First perform the trouble diagnosis for displayed other DTC.

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DTC P0125 ECT SENSOR

PFP:22630

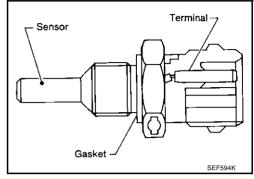
Component Description

ABS00064

NOTE:

If DTC P0125 is displayed with P0117 or P0118, first perform the trouble diagnosis for DTC P0117 or P0118. Refer to EC-190.

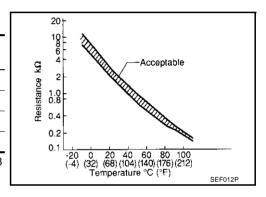
The engine coolant temperature sensor is used to detect the engine coolant temperature. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the engine coolant temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The 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	2.1 - 2.9
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 terminal 93 (Engine coolant temperature sensor) and ground.



CAUTION:

Do not 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.

On Board Diagnosis Logic

ABS00065

This self-diagnosis has the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0125 0125	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 P0125 ECT SENSOR

[TYPE 1]

DTC Confirmation Procedure

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CAUTION:

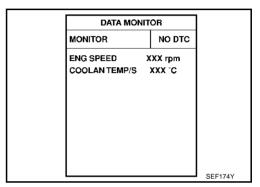
Be careful not to overheat engine.

NOTE

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

WITH CONSULT-II

- 1. Turn ignition switch "ON".
- Select "DATA MONITOR" mode with CONSULT-II.
- 3. Check that "COOLAN TEMP/S" is above 10°C (50°F). If it is above 10°C (50°F), the test result will be OK. If it is below 10°C (50°F), go to following step.
- 4. 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.
- 5. If 1st trip DTC is detected, go to EC-205, "Diagnostic Procedure"



WITH GST

Follow the procedure "WITH CONSULT-II" above.

Diagnostic Procedure

AB\$00068

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1. CHECK ENGINE COOLANT TEMPERATURE SENSOR

Refer to EC-206, "Component Inspection".

OK or NG

OK >> GO TO 2.

NG >> Replace engine coolant temperature sensor.

2. CHECK THERMOSTAT OPERATION

When the engine is cold [lower than 70°C (158°F)] condition, grasp lower radiator hose and confirm the engine coolant does not flow.

OK or NG

OK >> GO TO 3.

NG >> Repair or replace thermostat. Refer to CO-30, "THERMOSTAT AND THERMOSTAT HOUSING".

3. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

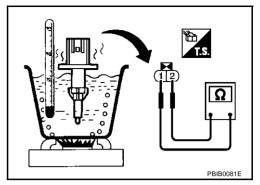
>> INSPECTION END

Revision; 2004 April

Component Inspection ENGINE COOLANT TEMPERATURE SENSOR

AB\$00069

1. Check resistance between engine coolant temperature sensor terminals 1 and 2 as shown in the figure.



<Reference data>

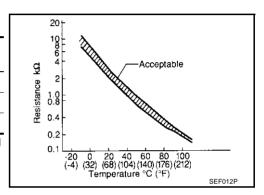
Engine coolant temperature °C (°F)	Voltage* V	Resistance k Ω
20 (68)	3.5	2.1 - 2.9
50 (122)	2.2	0.68 - 1.00
90 (194)	0.9	0.236 - 0.260

^{*:} These data are reference values and are measured between ECM terminal 93 (Engine coolant temperature sensor) and ground.

2. If NG, replace engine coolant temperature sensor.

Removal and Installation ENGINE COOLANT TEMPERATURE SENSOR

Refer to CO-30, "THERMOSTAT AND THERMOSTAT HOUSING".



ABS0006A

[TYPE 1]

DTC P0127 IAT SENSOR

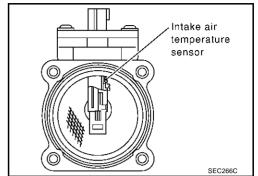
PFP:22630

Component Description

ABS0006B

The intake air temperature sensor is built into mass air flow sensor. The sensor detects intake air temperature and transmits a signal to the ECM.

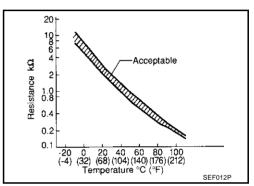
The temperature sensing unit uses a thermistor which is sensitive to the change in temperature. Electrical resistance of the thermistor decreases in response to the temperature rise.



<Reference data>

Intake air temperature °C (°F)	Voltage* V	Resistance kΩ
-10 (14)	4.43	7.9 - 9.3
25 (77)	3.32	1.9 - 2.1
80 (176)	1.23	0.31 - 0.37

^{*:} These data are reference values and are measured between ECM terminal 66 (Intake air temperature sensor) and ground.



CAUTION:

Do not 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.

On Board Diagnosis Logic

ABS0006C

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0127 0127	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

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Revision; 2004 April EC-207 2003 G35 Sedan

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DTC Confirmation Procedure

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NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

CAUTION:

Always drive vehicle at a safe speed.

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.

(P) WITH CONSULT-II

- 1. Wait until engine coolant temperature is less than 90°C (194°F)
- a. Turn ignition switch "ON".
- b. Select "DATA MONITOR" mode with CONSULT-II.
- c. Check the engine coolant temperature.
- d. If the engine coolant temperature is not less than 90°C (194°F), turn ignition switch "OFF" and cool down engine.
 - 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-II.
- 4. Start engine.
- Hold vehicle speed at more than 70 km/h (43 MPH) for 100 consecutive seconds.
- 6. If 1st trip DTC is detected, go to EC-208, "Diagnostic Procedure".

WITH GST

Follow the procedure "WITH CONSULT-II" above.

Diagnostic Procedure

ABS0006F

SEF189Y

1. CHECK INTAKE AIR TEMPERATURE SENSOR

Refer to EC-208, "Component Inspection".

OK or NG

OK >> GO TO 2.

NG >> Replace mass air flow sensor (with intake air temperature sensor).

2. CHECK INTERMITTENT INCIDENT

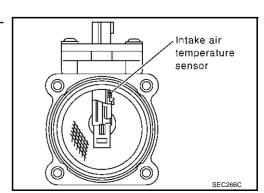
Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

Refer to EC-187, "Wiring Diagram".

>> INSPECTION END

Component Inspection INTAKE AIR TEMPERATURE SENSOR

 Check resistance between intake air temperature sensor terminals 3 and 5 under the following conditions. ABS0006G



DATA MONITOR

COOLAN TEMP/S XXX °C VHCL SPEED SE XXX km/h

B/FUEL SCHDI XXX msec

NO DTC

XXX rpm

MONITOR

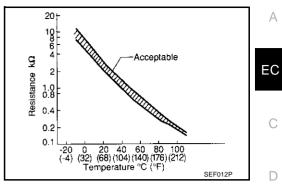
ENG SPEED

DTC P0127 IAT SENSOR

[TYPE 1]

Intake air temperature °C (°F)	Resistance kΩ	
25 (77)	1.9 - 2.1	

2. If NG, replace mass air flow sensor (with intake air temperature sensor).



ABS0006H

Removal and Installation MASS AIR FLOW SENSOR

Refer to EM-16, "AIR CLEANER AND AIR DUCT" .

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[TYPE 1]

DTC P0128 THERMOSTAT FUNCTION

PFP:21200

On Board Diagnosis Logic

ABS00061

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 stuck open.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0128 0128	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

ABS0006J

NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

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 60°C (140°F).

(A) WITH CONSULT-II

- Replace thermostat with new one. Refer to <u>CO-30</u>. Use only a genuine NISSAN thermostat as a replacement. If an incorrect thermostat is used, the MIL may come on.
- 2. Turn ignition switch "ON".
- 3. Select "COOLAN TEMP/S" in "DATA MONITOR" mode with CONSULT-II.
- Check that the "COOLAN TEMP/S" is above 60°C (140°F).
 If it is below 60°C (140°F), go to following step.
 If it is above 60°C (140°F), cool down the engine to less than 60°C (140°F), then retry from step 1.
- 5. Drive vehicle for 10 consecutive minutes under the following conditions.

VHCL SPEED SE	80 - 120 km/h (50 - 75 MPH)

If 1st trip DTC is detected, go to EC-210, "Diagnostic Procedure".

WITH GST

1. Follow the procedure "WITH CONSULT-II" above.

Diagnostic Procedure

ABS0006K

1. CHECK ENGINE COOLANT TEMPERATURE SENSOR

Refer to EC-211, "Component Inspection".

OK or NG

OK >> INSPECTION END

NG >> Replace engine coolant temperature sensor.

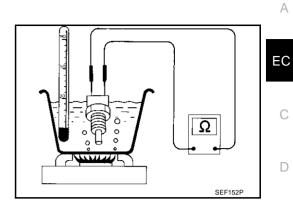
DTC P0128 THERMOSTAT FUNCTION

[TYPE 1]

Component Inspection ENGINE COOLANT TEMPERATURE SENSOR

ABS0006L

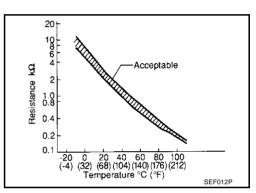
Check resistance as shown in the figure.



<Reference data>

Temperature °C (°F)	Resistance k Ω
20 (68)	2.1 - 2.9
50 (122)	0.68 - 1.0
90 (194)	0.236 - 0.260

If NG, replace engine coolant temperature sensor.



ABS0006M

Removal and Installation ENGINE COOLANT TEMPERATURE SENSOR

Refer to CO-30, "THERMOSTAT AND THERMOSTAT HOUSING".

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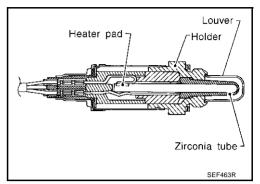
DTC P0132, P0152 HO2S1

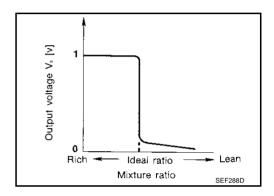
PFP:22690

Component Description

ABS0006N

The heated oxygen sensor 1 is placed into the exhaust manifold. It detects the amount of oxygen in the exhaust gas compared to the outside air. The heated oxygen sensor 1 has a closed-end tube made of ceramic zirconia. The zirconia generates voltage from approximately 1V in richer conditions to 0V in leaner conditions. The heated oxygen sensor 1 signal is sent to the ECM. The ECM adjusts the injection pulse duration to achieve the ideal air-fuel ratio. The ideal air-fuel ratio occurs near the radical change from 1 to 0V.





CONSULT-II Reference Value in Data Monitor Mode

ABS00001

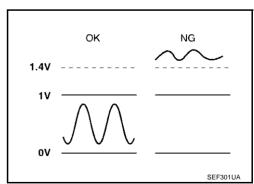
Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
HO2S1 (B1) HO2S1 (B2)	Engine: After warming up	Maintaining engine speed at 2,000 rpm	0 - 0.3V ←→ Approx. 0.6 - 1.0V
HO2S1 MNTR (B1) HO2S1 MNTR (B2)	Engine: After warming up	Maintaining engine speed at 2,000 rpm	LEAN ←→ RICH Changes more than 5 times during 10 seconds.

On Board Diagnosis Logic

ABS0006P

To judge the malfunction, the diagnosis checks that the heated oxygen sensor 1 output is not inordinately high.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0132 0132 (Bank 1) P0152 0152 (Bank 2)	Heated oxygen sensor 1 circuit high voltage	An excessively high voltage from the sensor is sent to ECM.	Harness or connectors (The sensor circuit is open or shorted) Heated oxygen sensor 1

DTC Confirmation Procedure

ABS0006Q

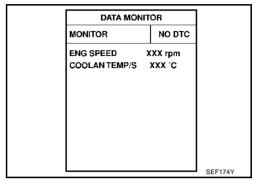
NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

(P) WITH CONSULT-II

- 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. Select "DATA MONITOR" mode with CONSULT-II.
- Restart engine and let it idle for 2 minutes.
- 6. If 1st trip DTC is detected, go to EC-217, "Diagnostic 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. Restart engine and let it idle for 2 minutes.
- 4. Turn ignition switch "OFF" and wait at least 10 seconds.
- 5. Restart engine and let it idle for 2 minutes.
- 6. Select "MODE 3" with GST.
- 7. If DTC is detected, go to EC-217, "Diagnostic Procedure".
- When using GST, "DTC Confirmation Procedure" should be performed twice as much as when using CONSULT-II because GST cannot display MODE 7 (1st trip DTC) concerning this diagnosis. Therefore, using CONSULT-II is recommended.

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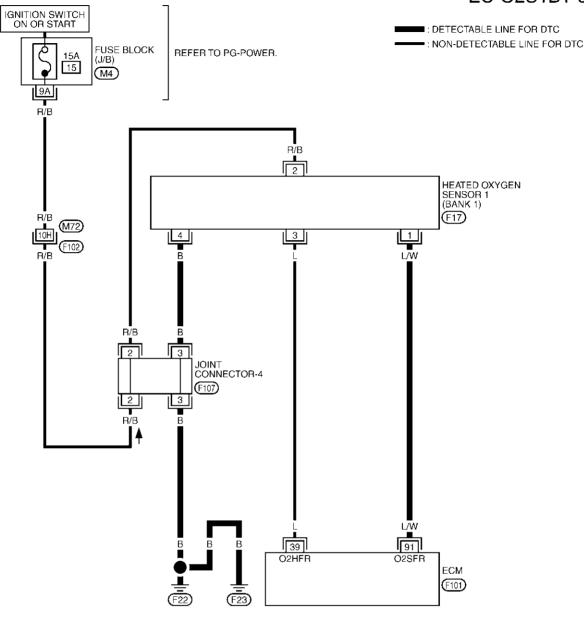
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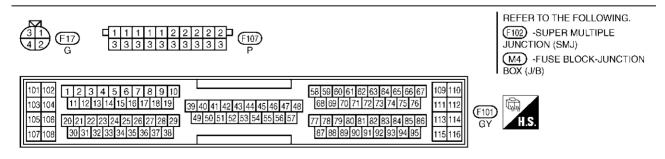
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Wiring Diagram BANK 1

ABS0006R

EC-O2S1B1-01





TBWT0317E

DTC P0132, P0152 HO2S1

[TYPE 1]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
91	L/W	Heated oxygen sensor 1 (bank 1)	[Engine is running]Warm-up conditionEngine speed is 2,000 rpm.	0 - Approximately 1.0V (Periodically change)

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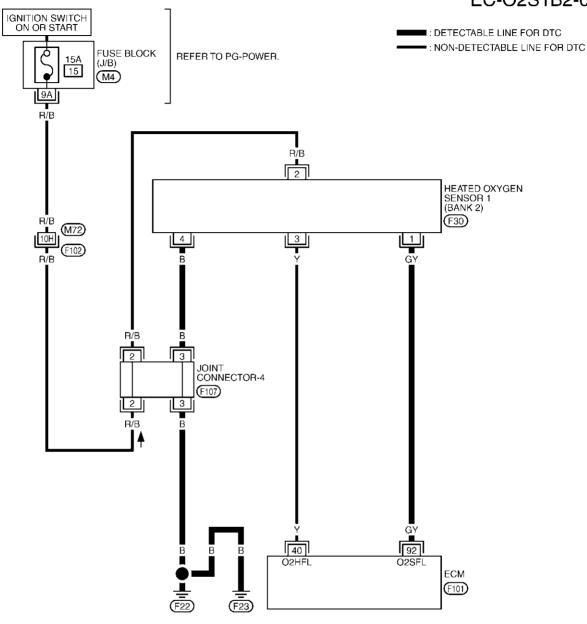
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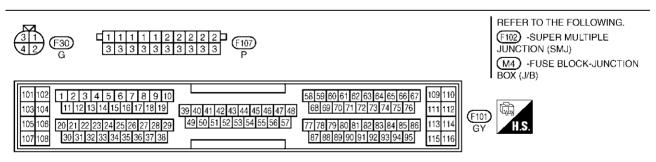
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BANK 2

EC-O2S1B2-01





TBWT0318E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

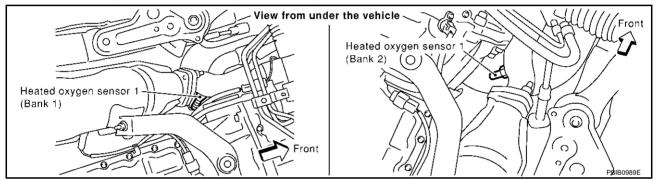
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
92	GY	Heated oxygen sensor 1 (bank 2)	[Engine is running]Warm-up conditionEngine speed is 2,000 rpm.	0 - Approximately 1.0V (Periodically change)

Diagnostic Procedure

1. RETIGHTEN HEATED OXYGEN SENSOR 1

- 1. Turn ignition switch "OFF".
- 2. Loosen and retighten corresponding heated oxygen sensor 1.

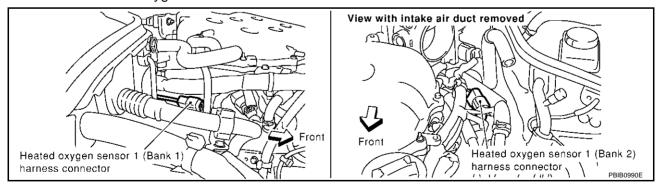


Tightening torque: 40 - 50 N·m (4.1 - 5.1 kg-m, 30 - 37 ft-lb)

>> GO TO 2.

2. CHECK HO2S1 GROUND CIRCUIT FOR OPEN AND SHORT

1. Disconnect heated oxygen sensor 1 harness connector.



2. Check harness continuity between HO2S1 terminal 4 and engine ground. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 4.

NG >> GO TO 3.

Revision; 2004 April EC-217 2003 G35 Sedan

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$\overline{3}$. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-4
- Harness for open or short to power in harness or connectors.
 - >> Repair open circuit or short to power in harness or connectors.

4. CHECK HO2S1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Disconnect ECM harness connector.
- Check harness continuity between ECM terminal and HO2S1 terminal as follows. Refer to Wiring Diagram.

DTC	Tern	Bank	
DIC	ECM	Sensor	Dank
P0132	91	1	1
P0152	92	1	2

Continuity should exist.

Check harness continuity between the following terminals and ground. Refer to Wiring Diagram.

DTC	Tern	Bank	
ыс	ECM	Sensor	Dank
P0132	91	1	1
P0152	92	1	2

Continuity should not exist.

4. Also check harness for short to power.

OK or NG

OK >> GO TO 5.

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

5. CHECK HO2S1 CONNECTOR FOR WATER

- 1. Turn ignition switch "OFF".
- Disconnect heated oxygen sensor 1 harness connector.
- 3. Check connectors for water.

Water should not exist.

OK or NG

OK >> GO TO 6.

NG >> Repair or replace harness or connectors.

6. CHECK HEATED OXYGEN SENSOR 1

Refer to EC-219, "Component Inspection".

OK or NG

OK >> GO TO 7.

NG >> Replace malfunctioning heated oxygen sensor 1.

7. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

Component Inspection HEATED OXYGEN SENSOR 1

- (P) With CONSULT-II
- 1. Start engine and warm it up to normal operating temperature.
- Select "MANU TRIG" and adjust "TRIGGER POINT" to 100% in "DATA MONITOR" mode with CONSULT-
- 3. Select "HO2S1 (B1)/(B2)" and "HO2S1 MNTR (B1)/(B2)".
- Hold engine speed at 2,000 rpm under no load during the following steps.
- Touch "RECORD" on CONSULT-II screen.

DATA MON	ITÓR
MONITOR	NO DTC
ENG SPEED	XXX rpm
MAS A/F SE-B1	xxx v
COOLAN TEMP/S	XXX .C
HO2S1 (B1)	XXX V
HO2S1 MNTR (B1)	LEAN

- 6. Check the following.
 - "HO2S1 MNTR (B1)/(B2)" in "DATA MONITOR" mode changes from "RICH" to "LEAN" to "RICH" 5 times in 10 seconds.
 - 5 times (cycles) are counted as shown at right.
 - "HO2S1 (B1)/(B2)" voltage goes above 0.6V at least once.
 - "HO2S1 (B1)/(B2)" voltage goes below 0.3V at least once.
 - "HO2S1 (B1)/(B2)" voltage never exceeds 1.0V.

Bank 1			
	cycle	1 2 3	4 5
HO2S1	MNTR (B1)	R-L-R-L-R-L-	R-L-R-L-R
Bank 2			
Dalik 2	cycle	1 2 3	4 5
HO2S1	•	R-L-R-L-R-L-	
R means	HO2S1		
MNTR (B1)/(B2) indica	tes RICH	
L means l	HO2S1		
MNTR (B1)/(B2) indica	ites LEAN	SEF647Y
R means MNTR (B1 L means I	HO2S1)/(B2) indica HO2S1	ites RICH	

Trigger	ENG SPEED	HO2S1 (B1)		128	,	Max	ximum 7	1	,	``\	,	`\	<i>!</i>	`	 Maximum voltage should be over 0.6V
	rpm	V]		/	ì	- 1	N.	- 1	À	- /	1	- 1	Ì	at least one time.
XXX	XXX	XXX]			•	-	-			•	•		-	at least one time.
XXX	XXX	XXX]				1	•			r	1	•		
XXX	XXX	XXX]												
XXX	XXX	XXX]	49-	٠.	- 1	:		•		•	•	•	•	N. 42 - 4 14
XXX	XXX	XXX]		i .	ı									 Minimum voltage should be below 0.30V
XXX	XXX	XXX]		N 1	į	- 1	1	- 1	Ļ	i	!	i	ļ.	
XXX	XXX	XXX]		} i	1	i	١,	į.	- 1	j	- 1	j.	1	at least one time.
XXX	XXX	XXX	1		N 1	i	!	i	- [i	- !	į.	-	į	
XXX	XXX	XXX]		1. /	١.	i	١.	i	١,	i	١,	i	,	
XXX	XXX	XXX]		W	'	J.	,	./	```		``	./	`	
XXX	XXX	XXX]								- Mini	mum			
XXX	XXX	XXX	J	0-											SEF648Y

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 tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.

EC-219 Revision; 2004 April 2003 G35 Sedan

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® Without CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- 2. Set voltmeter probes between ECM terminal 91 [HO2S1 (B1) signal] or 92 [HO2S1 (B2) signal] and engine ground.

ECM

91: Bank 1

92: Bank 2

CONNECTOR

- Check the following with engine speed held at 2,000 rpm constant under no load.
 - The voltage fluctuates between 0 to 0.3V and 0.6 to 1.0V more than 5 times within 10 seconds.
 - The maximum voltage is over 0.6V at least one time.
 - The minimum voltage is below 0.3V at least one time.
 - The voltage never exceeds 1.0V.

1 time: 0 - 0.3V \rightarrow 0.6 - 1.0V \rightarrow 0 - 0.3V

2 times: 0 - 0.3V \rightarrow 0.6 - 1.0V \rightarrow 0 - 0.3V \rightarrow 0.6 - 1.0V

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 tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.

Removal and Installation HEATED OXYGEN SENSOR 1

ABS0006U

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Refer to EM-24, "EXHAUST MANIFOLD AND THREE WAY CATALYST".

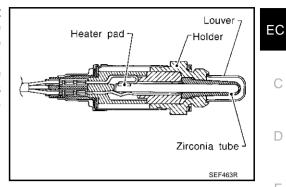
DTC P0133, P0153 HO2S1

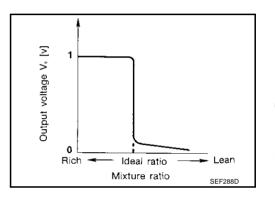
PFP:22690

Component Description

ABS0006V

The heated oxygen sensor 1 is placed into the exhaust manifold. It detects the amount of oxygen in the exhaust gas compared to the outside air. The heated oxygen sensor 1 has a closed-end tube made of ceramic zirconia. The zirconia generates voltage from approximately 1V in richer conditions to 0V in leaner conditions. The heated oxygen sensor 1 signal is sent to the ECM. The ECM adjusts the injection pulse duration to achieve the ideal air-fuel ratio. The ideal air-fuel ratio occurs near the radical change from 1 to 0V.





CONSULT-II Reference Value in Data Monitor Mode

ABS00008

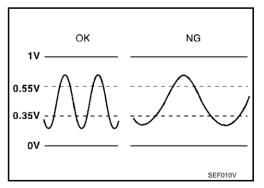
Specification data are reference values.

MONITOR ITEM	CON	SPECIFICATION	
HO2S1 (B1) HO2S1 (B2)	Engine: After warming up	Maintaining engine speed at 2,000 rpm	0 - 0.3V ←→ Approx. 0.6 - 1.0V
HO2S1 MNTR (B1) HO2S1 MNTR (B2)	Engine: After warming up	Maintaining engine speed at 2,000 rpm	LEAN ←→ RICH Changes more than 5 times during 10 seconds.

On Board Diagnosis Logic

ABS0006X

To judge the malfunction of heated oxygen sensor 1, this diagnosis measures response time of heated oxygen sensor 1 signal. The time is compensated by engine operating (speed and load), fuel feedback control constant, and heated oxygen sensor 1 temperature index. Judgment is based on whether the compensated time (heated oxygen sensor 1 cycling time index) is inordinately long or not.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0133 0133			Harness or connectors (The sensor circuit is open or shorted)
P0153 0153 (Bank 2)			Heated oxygen sensor 1
	Heated oxygen sensor	The response of the voltage signal from the sensor takes more than the specified time.	Fuel pressure
			• Injectors
	1 circuit slow response		Intake air leaks
			Exhaust gas leaks
			PCV valve
			Mass air flow sensor

DTC Confirmation Procedure

ABS0006Y

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

- Always perform at a temperature above –10°C (14°F).
- Before performing the following procedure, confirm that battery voltage is more than 11V at idle.

(P) WITH CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- 2. Stop engine and wait at least 10 seconds.
- 3. Turn ignition switch "ON" and select "HO2S1 (B1) P0133" or "HO2S1 (B2) P0153" of "HO2S1" in "DTC WORK SUPPORT" mode with CONSULT-II.
- 4. Touch "START".
- 5. Start engine and let it idle for at least 3 minutes.

NOTE:

Never raise engine speed above 3,600 rpm after this step. If the engine speed limit is exceeded, return to step 5.

44-4-17-11-1		
HO2S1 (B1) P0		
OUT OF CONDI		
MONITOR		
ENG SPEED		
B/FUEL SCHDL		
COOLAN TEMP/S		
VHCL SPEED SEN	0550007	
		SEF338Z

6. When the following conditions are met, "TESTING" will be displayed on the CONSULT-II screen. Maintain the conditions continuously until "TESTING" changes to "COMPLETED". (It will take approximately 20 to 50 seconds.)

ENG SPEED	1,200 - 3,100 rpm
Vehicle speed	More than 80 km/h (50 MPH)
B/FUEL SCHDL	2.5 - 12.0 msec
Selector lever	Suitable position

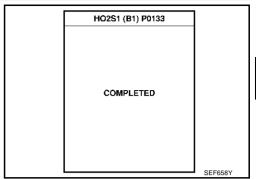
If "TESTING" is not displayed after 5 minutes, retry from | step 2.

HO2S1 (B1) P0		
TESTING		
MONITOR		
ENG SPEED		
B/FUEL SCHDL		
COOLAN TEMP/S		
VHCL SPEED SEN	XXX km/h	
		SEF339Z

DTC P0133, P0153 HO2S1

[TYPE 1]

 Make sure that "OK" is displayed after touching "SELF-DIAG RESULTS". If "NG" is displayed, refer to <u>EC-227</u>, "<u>Diagnostic</u> Procedure".



Overall Function Check

BS0006Z

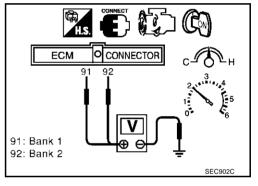
Use this procedure to check the overall function of the heated oxygen sensor 1 circuit. During this check, a DTC might not be confirmed.

WITH GST

- 1. Start engine and warm it up to normal operating temperature.
- 2. Set voltmeter probes between ECM terminal 91 [HO2S1(B1) signal] or 92 [HO2S1(B2) signal] and engine ground.
- 3. Check the following with engine speed held at 2,000 rpm constant under no load.
- The voltage fluctuates between 0 to 0.3V and 0.6 to 1.0V more than 5 times within 10 seconds.

1 time: $\begin{array}{ll} \text{0 - 0.3V} \rightarrow \text{0.6 - 1.0V} \rightarrow \text{0 - 0.3V} \\ \text{2} & \text{0 - 0.3V} \rightarrow \text{0.6 - 1.0V} \rightarrow \text{0 - 0.3V} \rightarrow \text{0.6 - 1.0V} \\ \text{times:} & \rightarrow \text{0 - 0.3V} \end{array}$

4. If NG, go to EC-227, "Diagnostic Procedure".



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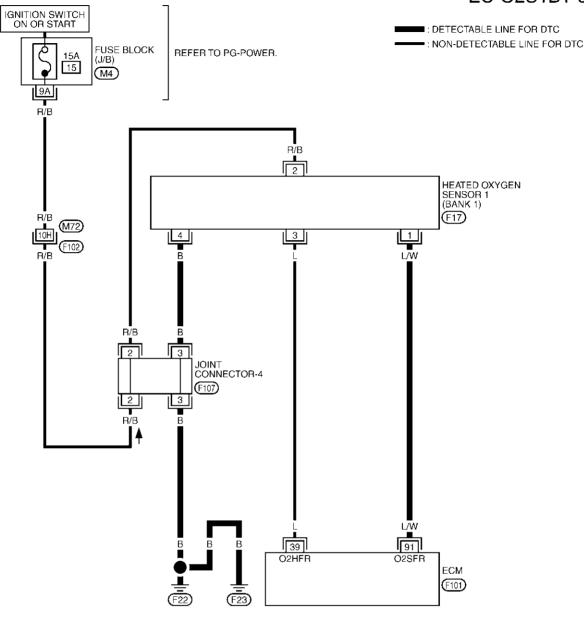
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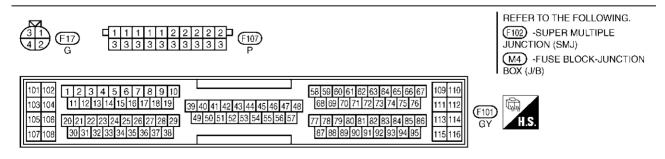
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Wiring Diagram BANK 1

ABS00070

EC-O2S1B1-01





TBWT0317E

DTC P0133, P0153 HO2S1

[TYPE 1]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
91	L/W	Heated oxygen sensor 1 (bank 1)	[Engine is running]Warm-up conditionEngine speed is 2,000 rpm.	0 - Approximately 1.0V (Periodically change)

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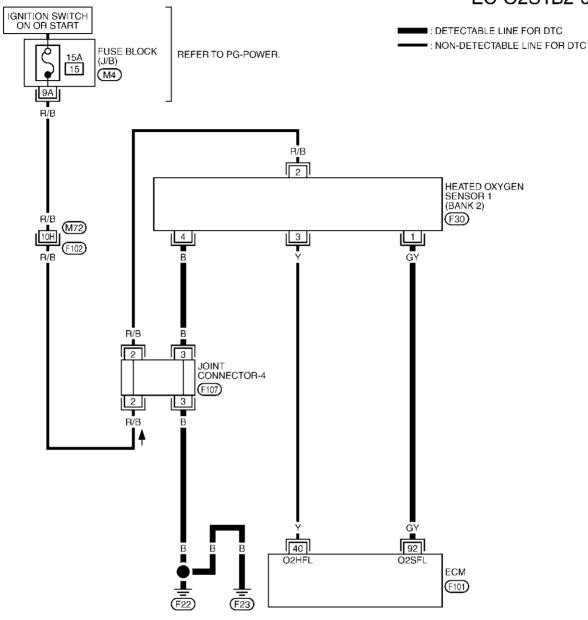
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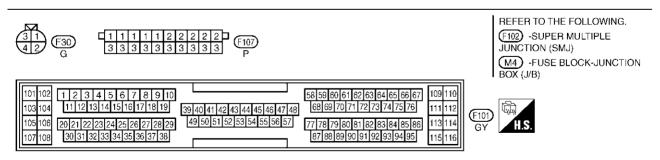
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BANK 2







TBWT0318E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

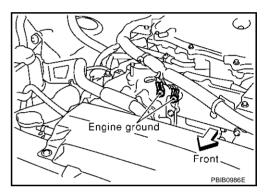
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
92	GY	Heated oxygen sensor 1 (bank 2)	[Engine is running]Warm-up conditionEngine speed is 2,000 rpm.	0 - Approximately 1.0V (Periodically change)

Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

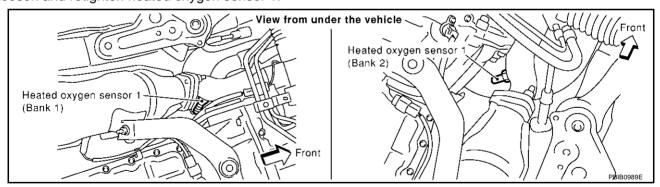
- 1. Turn ignition switch "OFF".
- 2. Loosen and retighten engine ground screws.

>> GO TO 2.



2. RETIGHTEN HEATED OXYGEN SENSOR 1

Loosen and retighten heated oxygen sensor 1.



Tightening torque: 40 - 50 N·m (4.1 - 5.1 kg-m, 30 - 37 ft-lb)

>> GO TO 3.

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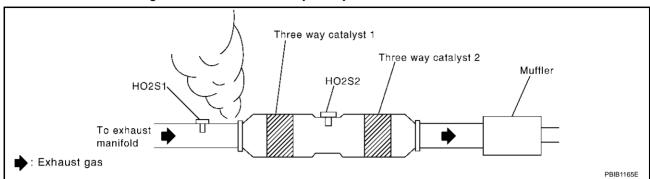
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3. CHECK FOR EXHAUST GAS LEAK

- 1. Start engine and run it at idle.
- 2. Listen for an exhaust gas leak before three way catalyst 1.



OK or NG

OK >> GO TO 4.

NG >> Repair or replace.

4. CHECK FOR INTAKE AIR LEAK

Listen for an intake air leak after the mass air flow sensor.

OK or NG

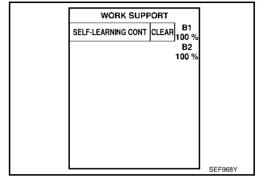
OK >> GO TO 5.

NG >> Repair or replace.

5. CLEAR THE SELF-LEARNING DATA

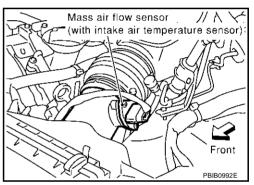
(II) With CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- Select "SELF-LEARNING CONT" in "WORK SUPPORT" mode with CONSULT-II.
- Clear the self-learning control coefficient by touching "CLEAR".
- 4. 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?



(X) Without CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- 2. Turn ignition switch "OFF".
- 3. Disconnect mass air flow sensor harness connector, and restart and run engine for at least 5 seconds at idle speed.
- Stop engine and reconnect mass air flow sensor harness connector.
- 5. Make sure DTC P0102 is displayed.
- 6. Erase the DTC memory. Refer to <u>EC-69</u>, "HOW TO ERASE <u>EMISSION-RELATED DIAGNOSTIC INFORMATION"</u>.
- 7. Make sure DTC P0000 is displayed.
- 8. 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 or No

Yes \Rightarrow Perform trouble diagnosis for DTC P0171, P0174 or DTC P0172, P0175 (Refer to EC-264 or EC-273).

No >> GO TO 6.

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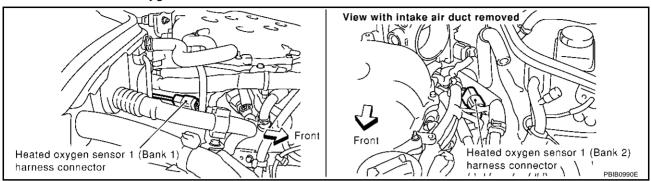
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6. CHECK HO2S1 GROUND CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch "OFF".
- 2. Disconnect heated oxygen sensor 1 harness connector.



3. Check harness continuity between HO2S1 terminal 4 and engine ground. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to power.

OK or NG

OK >> GO TO 8. NG >> GO TO 7.

7. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-4
- Harness for open or short to power in harness or connectors.
 - >> Repair open circuit or short to power in harness or connectors.

[TYPE 1]

8. CHECK HO2S1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Disconnect ECM harness connector.
- Check harness continuity between ECM terminal and HO2S1 terminal as follows. Refer to Wiring Diagram.

DTC	Term	Bank	
ыс	ECM	Sensor	Dank
P0133	91	1	1
P0153	92	1	2

Continuity should exist.

3. Check harness continuity between the following terminals and ground. Refer to Wiring Diagram.

DTC	Term	Bank	
ыс	ECM	Sensor	Dank
P0133	91	1	1
P0153	92	1	2

Continuity should not exist.

4. Also check harness for short to power.

OK or NG

OK >> GO TO 9.

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

9. CHECK MASS AIR FLOW SENSOR

Refer to EC-184, "Component Inspection".

OK or NG

OK >> GO TO 10.

NG >> Replace mass air flow sensor.

10. CHECK PCV VALVE

Refer to EC-648, "Component Inspection".

OK or NG

OK >> GO TO 11.

NG >> Replace PCV valve.

11. CHECK HEATED OXYGEN SENSOR 1

Refer to EC-232, "Component Inspection".

OK or NG

OK >> GO TO 12.

NG >> Replace malfunctioning heated oxygen sensor 1.

12. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

Revision; 2004 April EC-231 2003 G35 Sedan

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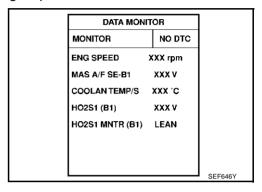
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Component Inspection HEATED OXYGEN SENSOR 1

ABS00072

(P) With CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- Select "MANU TRIG" and adjust "TRIGGER POINT" to 100% in "DATA MONITOR" mode with CONSULT-II.
- 3. Select "HO2S1 (B1)/(B2)" and "HO2S1 MNTR (B1)/(B2)".
- 4. Hold engine speed at 2,000 rpm under no load during the following steps.
- Touch "RECORD" on CONSULT-II screen.



- 6. Check the following.
 - "HO2S1 MNTR (B1)/(B2)" in "DATA MONITOR" mode changes from "RICH" to "LEAN" to "RICH" 5 times in 10 seconds.
 - 5 times (cycles) are counted as shown at right.
 - "HO2S1 (B1)/(B2)" voltage goes above 0.6V at least once.
 - "HO2S1 (B1)/(B2)" voltage goes below 0.3V at least once.
 - "HO2S1 (B1)/(B2)" voltage never exceeds 1.0V.

Bank 1
cycle 1 2 3 4 5
HO2S1 MNTR (B1) R-L-R-L-R-L-R-L-R
Bank 2
cycle 1 2 3 4 5
HO2S1 MNTR (B2) R-L-R-L-R-L-R-L-R
R means HO2S1
MNTR (B1)/(B2) indicates RICH
L means HO2S1
MNTR (B1)/(B2) indicates LEAN SEF647Y

Trigger	ENG SPEED	HO2S1 (B1)	128		Ma: ●.	ximum	1	,	·	ſ.	`.	\(\alpha\)		Maximum voltage should be over 0.6V
1 2/2/2	rpm	V		/	, ,	-I	Ì	- /	j	- 1	,	-1	!	at least one time.
XXX	XXX	XXX	l											
XXX	XXX	XXX	l			- 1	•	•		r	1	•		
XXX	XXX	XXX	l .											
XXX	XXX	XXX	5-	. ·	- 1	2	- 1	1	- 1	•	•			
XXX	XXX	XXX	1 "									_		 Minimum voltage
XXX	XXX	XXX	1	i (i	- !	i	- 1	i	- 1	1		Į.	should be below 0.30V
XXX	XXX	XXX	1	1 1	1	i	1	i	. !	i	1	i	1	at least one time.
XXX	XXX	XXX	1	V = I	1	1	1	!	١.		i i	1	i	
XXX	XXX	XXX	1	i /	ì	- [į	- 1	, i	- /	1	- /	Ņ	
XXX	XXX	XXX	1	W	,	Ú.	1		٠,	e i	'	, i	`_	
XXX	XXX	XXX	1							[™] Mini	mum	1		
XXX	XXX	XXX	1 _											
			0	•										SEF648Y

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 tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.

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⊗ Without CONSULT-II

- Start engine and warm it up to normal operating temperature.
- Set voltmeter probes between ECM terminal 91 [HO2S1 (B1) signal] or 92 [HO2S1 (B2) signal] and engine ground.
- Check the following with engine speed held at 2,000 rpm constant under no load.
 - The voltage fluctuates between 0 to 0.3V and 0.6 to 1.0V more than 5 times within 10 seconds.
 - The maximum voltage is over 0.6V at least one time.
 - The minimum voltage is below 0.3V at least one time.
 - The voltage never exceeds 1.0V.

1 time: $0 - 0.3V \rightarrow 0.6 - 1.0V \rightarrow 0 - 0.3V$

2 times: $0 - 0.3V \rightarrow 0.6 - 1.0V \rightarrow 0 - 0.3V \rightarrow 0.6 - 1.0V$

ECM CONNECTOR 91: Bank 1 92: Bank 2 SEC902C

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
- Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.

Removal and Installation **HEATED OXYGEN SENSOR 1**

Refer to EM-24, "EXHAUST MANIFOLD AND THREE WAY CATALYST".

ABS00073

EC-233 Revision; 2004 April 2003 G35 Sedan

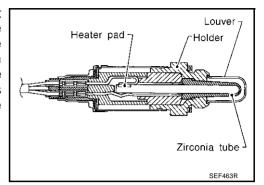
DTC P0134, P0154 HO2S1

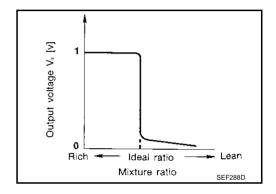
PFP:22690

Component Description

ABS00074

The heated oxygen sensor 1 is placed into the exhaust manifold. It detects the amount of oxygen in the exhaust gas compared to the outside air. The heated oxygen sensor 1 has a closed-end tube made of ceramic zirconia. The zirconia generates voltage from approximately 1V in richer conditions to 0V in leaner conditions. The heated oxygen sensor 1 signal is sent to the ECM. The ECM adjusts the injection pulse duration to achieve the ideal air-fuel ratio. The ideal air-fuel ratio occurs near the radical change from 1 to 0V.





CONSULT-II Reference Value in Data Monitor Mode

ABS00007

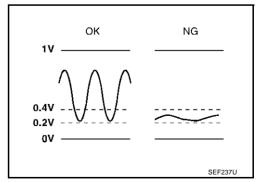
Specification data are reference values.

MONITOR ITEM	CON	SPECIFICATION	
HO2S1 (B1) HO2S1 (B2)	Engine: After warming up	Maintaining engine speed at 2,000 rpm	0 - 0.3V ←→ Approx. 0.6 - 1.0V
HO2S1 MNTR (B1) HO2S1 MNTR (B2)	Engine: After warming up	Maintaining engine speed at 2,000 rpm	LEAN ←→ RICH Changes more than 5 times during 10 seconds.

On Board Diagnosis Logic

ABS00076

Under the condition in which the heated oxygen sensor 1 signal is not input, the ECM circuits will read a continuous approximately 0.3V. Therefore, for this diagnosis, the time that output voltage is within 200 to 400 mV range is monitored, and the diagnosis checks that this time is not inordinately long.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0134 0134 (Bank 1) P0154 0154 (Bank 2)	Heated oxygen sensor 1 circuit no activity detected	The voltage from the sensor is constantly approx. 0.3V.	 Harness or connectors (The sensor circuit is open or shorted) Heated oxygen sensor 1

DTC Confirmation Procedure

ABS00077

CAUTION:

Always drive vehicle at a safe speed.

NOTE

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 11V at idle.

(P) WITH CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- Select "HO2S1 (B1) P0134" or "HO2S1 (B2) P0154" of "HO2S1" in "DTC WORK SUPPORT" mode with CONSULT-II.
- 3. Touch "START".
- 4. Let it idle for at least 3 minutes.

NOTE:

Never raise engine speed above 3,600 rpm after this step. If the engine speed limit is exceeded, return to step 4.

HO2S1 (B1) PC	1134	
OUT OF CONDI		
MONITOR		
ENG SPEED	XXX rpm	
B/FUEL SCHDL	XXX msec	
COOLAN TEMP/S		
VHCL SPEED SEN	XXX km/h	PBIB0544E

When the following conditions are met, "TESTING" will be displayed on the CONSULT-II screen. Maintain the conditions continuously until "TESTING" changes to "COMPLETED". (It will take approximately 10 to 60 seconds.)

ENG SPEED	1,400 - 2,600 rpm
Vehicle speed	More than 64 km/h (40 MPH)
B/FUEL SCHDL	2.0 - 12.0 msec
Selector lever	Suitable position

If "TESTING" is not displayed after 5 minutes, retry from step 2.

6. Make sure that "OK" is displayed after touching "SELF-DIAG RESULTS". If "NG" is displayed, refer to EC-240, "Diagnostic Procedure".

HO2S1 (B1) P0	134	
TESTING		
MONITOR		
ENG SPEED	XXX rpm	
B/FUEL SCHOL	XXX msec	
COOLAN TEMP/S	xxx.c	
VHCL SPEED SEN	XXX km/h	PBIB0545E

HO2S1 (B1) P0134

COMPLETED

SEC750C

Overall Function Check

ABS00078

Use this procedure to check the overall function of the heated oxygen sensor 1 circuit. During this check, a DTC might not be confirmed.

Revision; 2004 April EC-235 2003 G35 Sedan

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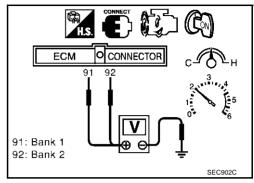
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- 1. Start engine and warm it up to normal operating temperature.
- 2. Set voltmeter probes between ECM terminal 91 [HO2S1 (B1) signal] or 92 [HO2S1 (B2) signal] and engine ground.
- 3. Check the following with engine speed held at 2,000 rpm constant under no load.
- The voltage does not remain in the range of 0.2 to 0.4V.
- 4. If NG, go to EC-240, "Diagnostic Procedure".



Wiring Diagram BANK 1

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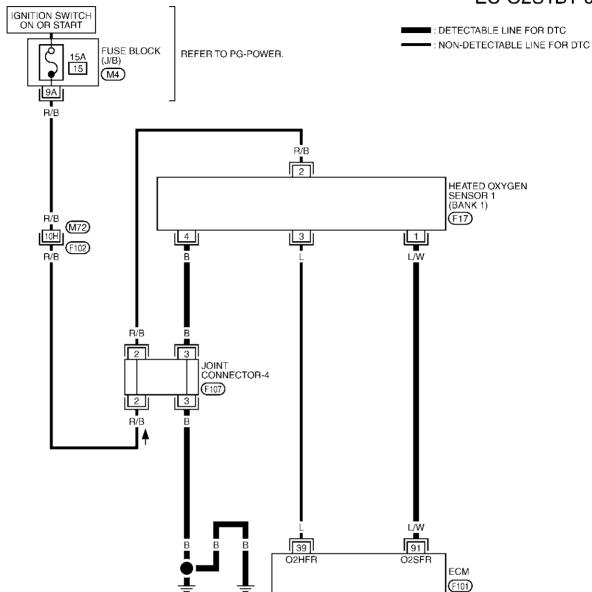
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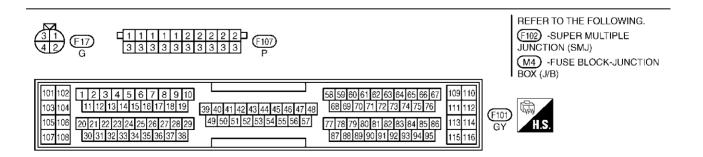
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TBWT0317E

DTC P0134, P0154 HO2S1

[TYPE 1]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
91	L/W	Heated oxygen sensor 1 (bank 1)	[Engine is running]Warm-up conditionEngine speed is 2,000 rpm.	0 - Approximately 1.0V (Periodically change)

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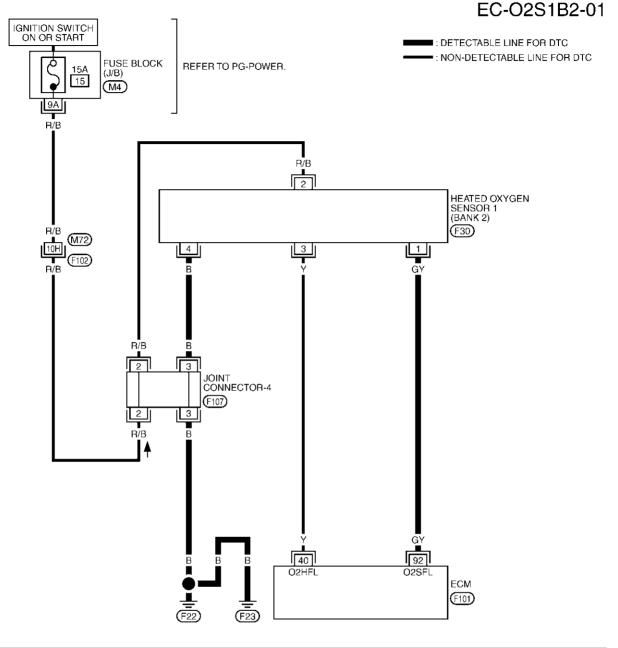
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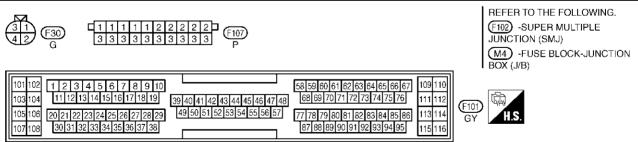
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TBWT0318E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
92	GY	Heated oxygen sensor 1 (bank 2)	[Engine is running]Warm-up conditionEngine speed is 2,000 rpm.	0 - Approximately 1.0V (Periodically change)

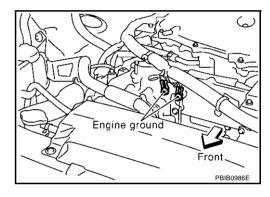
Diagnostic Procedure

ABS0007A

1. INSPECTION START

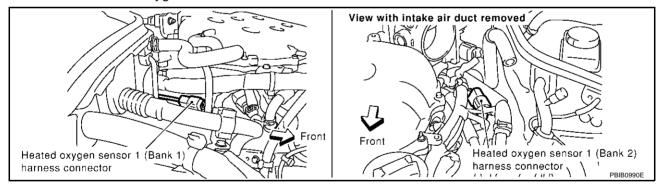
- 1. Turn ignition switch "OFF".
- 2. Loosen and retighten engine ground screws.

>> GO TO 2.



$2. \ \mathsf{CHECK} \ \mathsf{HO2S1} \ \mathsf{GROUND} \ \mathsf{CIRCUIT} \ \mathsf{FOR} \ \mathsf{OPEN} \ \mathsf{AND} \ \mathsf{SHORT}$

1. Disconnect heated oxygen sensor 1 harness connector.



Check harness continuity between HO2S1 terminal 4 and engine ground. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 4. NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-4
- Harness for open or short to power in harness or connectors.

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

DTC P0134, P0154 HO2S1

[TYPE 1]

4. CHECK HO2S1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Disconnect ECM harness connector.
- 2. Check harness continuity between ECM terminal and HO2S1 terminal as follows. Refer to Wiring Diagram.

DTC	Term	ninals	Bank
ыс	ECM	Sensor	Dank
P0134	91	1	1
P0154	92	1	2

Continuity should exist.

3. Check harness continuity between the following terminals and ground. Refer to Wiring Diagram.

DTC	Term	ninals	Bank
ыс	ECM	Sensor	Dank
P0134	91	1	1
P0154	92	1	2

Continuity should not exist.

4. Also check harness for short to power.

OK or NG

OK >> GO TO 5.

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

5. CHECK HEATED OXYGEN SENSOR 1

Refer to EC-241, "Component Inspection".

OK or NG

OK >> GO TO 6.

NG >> Replace malfunctioning heated oxygen sensor 1.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

Component Inspection HEATED OXYGEN SENSOR 1

(P) With CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- Select "MANU TRIG" and adjust "TRIGGER POINT" to 100% in "DATA MONITOR" mode with CONSULT-II.
- 3. Select "HO2S1 (B1)/(B2)" and "HO2S1 MNTR (B1)/(B2)".
- 4. Hold engine speed at 2,000 rpm under no load during the following steps.

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5. Touch "RECORD" on CONSULT-II screen.

DATA MON	ITOR
MONITOR	NO DTC
ENG SPEED	XXX rpm
MAS A/F SE-B1	xxx v
COOLAN TEMP/S	XXX .C
HO2S1 (B1)	XXX V
HO2S1 MNTR (B1)	LEAN

- Check the following.
 - "HO2S1 MNTR (B1)/(B2)" in "DATA MONITOR" mode changes from "RICH" to "LEAN" to "RICH" 5 times in 10 seconds.
 - 5 times (cycles) are counted as shown at right.
 - "HO2S1 (B1)/(B2)" voltage goes above 0.6V at least once.
 - "HO2S1 (B1)/(B2)" voltage goes below 0.3V at least once.
 - "HO2S1 (B1)/(B2)" voltage never exceeds 1.0V.

Bank 1 cycle 1 2 3	4 5
HO2S1 MNTR (B1) R-L-R-L-R-L-	
Bank 2	
cycle 1 2 3	4 5
HO2S1 MNTR (B2) R-L-R-L-R-L-	
R means HO2S1 MNTR (B1)/(B2) indicates RICH	
L means HO2S1 MNTR (B1)/(B2) indicates LEAN	SEF647Y

Trigger	ENG SPEED	HO2S1 (B1)		128	,	Maxir ●.			\sim		/~		,	``	 Maximum voltage should be over 0.6V
	rpm	V	1		- 1	,	-I	/	1		/	`	- /	1	at least one time.
XXX	XXX	XXX													
XXX	XXX	XXX	J		•		1	1	•		r	•	•		
XXX	XXX	XXX]												
XXX	XXX	XXX	1	64		1	:		1	1	•	•			
XXX	XXX	XXX	1	-											 Minimum voltage
XXX	XXX	XXX]		Γ .	ĺ	1	į	-	į.	1	!	H	ţ	should be below 0.30V
XXX	XXX	XXX	1		1 i	•	i	1	í	!	i	- 1	i	1	at least one time.
XXX	XXX	XXX	1		N I	1	!	i	ļ	1	!	i	1	i	
XXX	XXX	XXX	1		i /	ì	1	Ĺ	!	Ų.	/	,	1	į	
XXX	XXX	XXX	1		W	\ \	<i>i</i>	\.\		` `	ř.	`.	į.	``	
XXX	XXX	XXX]							_	Minin	num			
XXX	XXX	XXX	1												

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 tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.

- 1. Start engine and warm it up to normal operating temperature.
- 2. Set voltmeter probes between ECM terminal 91 [HO2S1 (B1) signal] or 92 [HO2S1 (B2) signal] and engine ground.
- Check the following with engine speed held at 2,000 rpm constant under no load.
 - The voltage fluctuates between 0 to 0.3V and 0.6 to 1.0V more than 5 times within 10 seconds.
 - The maximum voltage is over 0.6V at least one time.
 - The minimum voltage is below 0.3V at least one time.
 - The voltage never exceeds 1.0V.

1 time: $0 - 0.3V \rightarrow 0.6 - 1.0V \rightarrow 0 - 0.3V$

2 times: $0 - 0.3V \rightarrow 0.6 - 1.0V \rightarrow 0 - 0.3V \rightarrow 0.6 - 1.0V$

ECM OCONNECTOR 91 92 91: Bank 1 92: Bank 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.

DTC P0134, P0154 HO2S1

[TYPE 1]

 Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.

Removal and Installation HEATED OXYGEN SENSOR 1

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Refer to EM-24, "EXHAUST MANIFOLD AND THREE WAY CATALYST".

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DTC P0138, P0158 HO2S2

PFP:226A0

Component Description

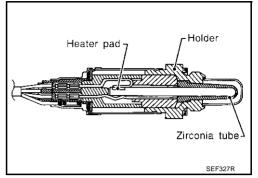
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The heated oxygen sensor 2, after three way catalyst 1, monitors the oxygen level in the exhaust gas on each bank.

Even if switching characteristics of the heated oxygen 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 1V in richer conditions to 0V in leaner conditions.

Under normal conditions the heated oxygen sensor 2 is not used for engine control operation.



CONSULT-II Reference Value in Data Monitor Mode

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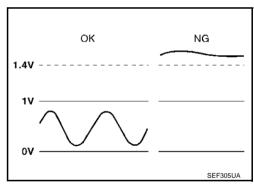
Specification data are reference values.

MONITOR ITEM	CON	NDITION	SPECIFICATION
HO2S2 (B1) HO2S2 (B2)	Warm-up conditionAfter keeping engine speed	Revving engine from idle to 3,000 rpm	0 - 0.3V ←→ Approx. 0.6 - 1.0V
HO2S2 MNTR (B1) HO2S2 MNTR (B2)	between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	quickly.	$LEAN \longleftrightarrow RICH$

On Board Diagnosis Logic

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The heated oxygen sensor 2 has a much longer switching time between rich and lean than the heated oxygen sensor 1. The oxygen storage capacity before the three way catalyst causes the longer switching time. To judge the malfunctions of heated oxygen sensor 2, ECM monitors whether the voltage is unusually high during the various driving condition such as fuel-cut.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0138 0138 (Bank 1)	Heated oxygen sensor	An excessively high voltage from the sensor is	Harness or connectors (The sensor circuit is open or shorted)
P0158 0158 (Bank 2)	2 circuit high voltage	sent to ECM.	Heated oxygen sensor 2

[TYPE 1]

DTC Confirmation Procedure

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CAUTION:

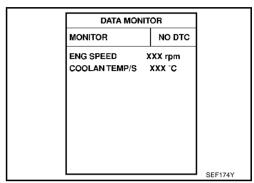
Always drive vehicle at a safe speed.

NOTE

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

(P) WITH CONSULT-II

- 1. Turn ignition switch "ON" and select "DATA MONITOR" mode with CONSULT-II.
- 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.
- 5. Let engine idle for 2 minutes.
- If 1st trip DTC is detected, go to <u>EC-249, "Diagnostic Procedure"</u>



® 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.
- 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 2 minutes.
- 5. Turn ignition switch "OFF" and wait at least 10 seconds.
- 6. 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 2 minutes.
- 8. Select "Mode 3" with GST.
- 9. If DTC is detected, go to EC-249, "Diagnostic Procedure".

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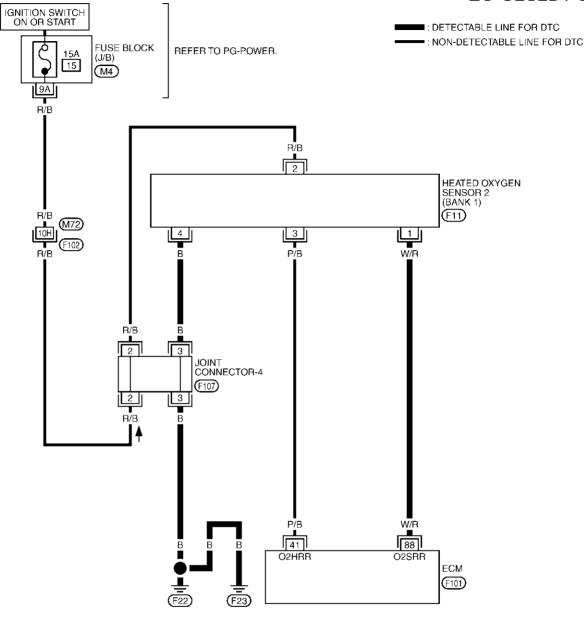
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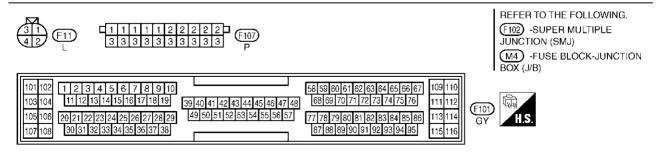
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Wiring Diagram
BANK 1

EC-02S2B1-01





TBWT0319E

DTC P0138, P0158 HO2S2

[TYPE 1]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

			<u> </u>	
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
			[Engine is running] ● Warm-up condition	
88	W/R	Heated oxygen sensor 2 (bank 1)	 Revving engine from idle to 3,000 rpm quickly after the following conditions are met. 	0 - Approximately 1.0V
			 After keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load. 	

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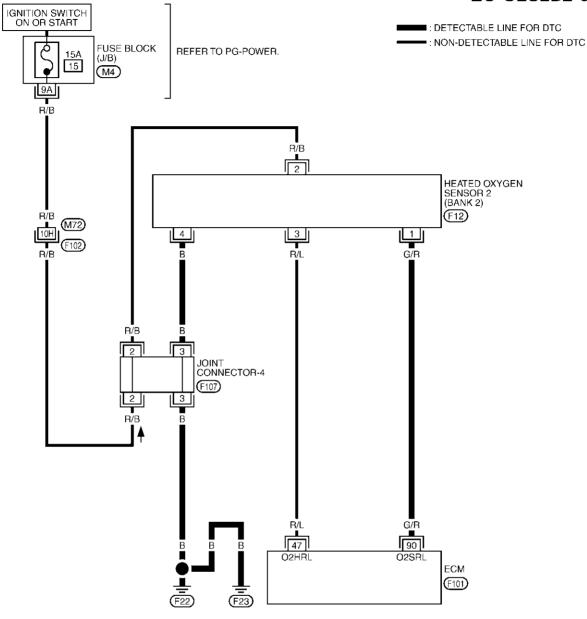
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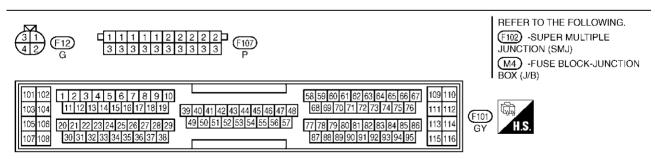
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BANK 2

EC-O2S2B2-01





TBWT0320E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

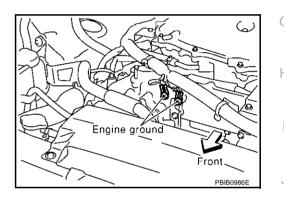
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)	-
			[Engine is running] • Warm-up condition		_
90	G/R	Heated oxygen sensor 2 (bank 2)	 Revving engine from idle to 3,000 rpm quickly after the following conditions are met. 	0 - Approximately 1.0V	
			 After keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load. 		

Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

- 1. Turn ignition switch "OFF".
- Loosen and retighten engine ground screws.

>> GO TO 2.



2. CHECK HO2S2 GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch "OFF".
- Disconnect heated oxygen sensor 2 harness connector.
- Check harness continuity between HO2S2 terminal 4 and engine ground. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to power.

OK or NG

OK >> GO TO 4. NG >> GO TO 3.

Heated oxygen | Heated oxygen | sensor 2 (Bank 1) | Heated oxygen | Heated oxy

View from under the vehicle

3. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-4
- Harness open or short between HO2S2 and engine ground
 - >> Repair open circuit or short to power in harness or connectors.

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Revision; 2004 April EC-249 2003 G35 Sedan

4. CHECK HO2S2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Disconnect ECM harness connector.
- 2. Check harness continuity between ECM terminal and HO2S2 terminal as follows. Refer to Wiring Diagram.

DTC	Term	ninals	Bank
ы	ECM	Sensor	Dank
P0138	88	1	1
P0158	90	1	2

Continuity should exist.

Check harness continuity between the following terminals and ground. Refer to Wiring Diagram.

DTC	Tern	ninals	Bank
ыс	ECM	Sensor	Balik
P0138	88	1	1
P0158	90	1	2

Continuity should not exist.

4. Also check harness for short to power.

OK or NG

OK >> GO TO 5.

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

5. CHECK HO2S2 CONNECTOR FOR WATER

- 1. Turn ignition switch "OFF".
- 2. Disconnect heated oxygen sensor 2 harness connector.
- 3. Check connectors for water.

Water should not exist.

OK or NG

OK >> GO TO 6.

NG >> Repair or replace harness or connectors.

6. CHECK HEATED OXYGEN SENSOR 2

Refer to EC-251, "Component Inspection".

OK or NG

OK >> GO TO 6.

NG >> Replace malfunctioning heated oxygen sensor 2.

7. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

[TYPE 1]

Component Inspection HEATED OXYGEN SENSOR 2

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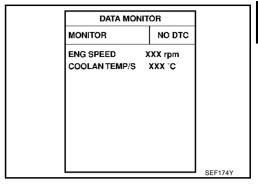
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(P) With CONSULT-II

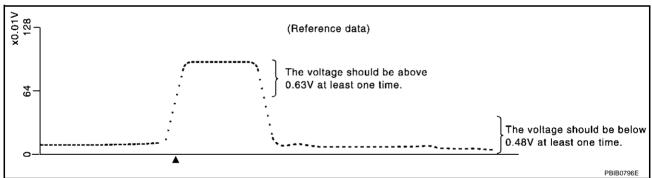
- 1. Turn ignition switch "ON" and select "DATA MONITOR" mode with CONSULT-II.
- Start engine and warm it up to the normal operating temperature.
- 3. Turn ignition switch "OFF" and wait at least 10 seconds.
- 4. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- 5. Let engine idle for 1 minutes.



6. Select "FUEL INJECTION" in "ACTIVE TEST" mode, and select "HO2S2 (B1)/(B2)" as the monitor item with CONSULT-II.

ACTIVE TES		
FUEL INJECTION	25 %	
MONITOR	l	
ENG SPEED	XXX rpm	
HO2S1 (B1)	xxx v	
HO2S2 (B1)	xxx v	
HO2S1 MNTR (B1)	RICH	
HO2S2 MNTR (B1)	RICH	
	_	SEF662Y

7. Check "HO2S2 (B1)/(B2)" at idle speed when adjusting "FUEL INJECTION" to ±25%.



"HO2S2 (B1)/(B2)" should be above 0.63V at least once when the "FUEL INJECTION" is +25%. "HO2S2 (B1)/(B2)" should be below 0.48V at least once when the "FUEL INJECTION" is -25%.

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 tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.

⋈ Without CONSULT-II

- 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.
- Let engine idle for 1 minutes.
- 5. Set voltmeter probes between ECM terminal 88 [HO2S2 (B1) signal] or 90 [HO2S2 (B2) signal] and engine ground.

6. Check the voltage when revving up to 4,000 rpm under no load at least 10 times.

(Depress and release accelerator pedal as soon as possible.) The voltage should be above 0.63V at least once during this procedure.

If the voltage is above 0.63V at step 6, step 7 is not necessary.

 Keep vehicle at idling for 10 minutes, then check voltage. Or check the voltage when coasting from 80 km/h (50 MPH) in "D" position.

The voltage should be below 0.48V at least once during this procedure.

8. If NG, replace heated oxygen sensor 2.

ECM OCONNECTOR C H 88 90 2 3 4 4 5 6 6 6 8 8 8 8 Bank 1 90: Bank 2 SEC903C

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 tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.

Removal and Installation HEATED OXYGEN SENSOR 2

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Refer to EM-24, "EXHAUST MANIFOLD AND THREE WAY CATALYST".

DTC P0139, P0159 HO2S2

PFP:226A0

Component Description

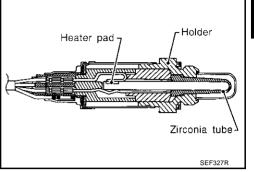
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The heated oxygen sensor 2, after three way catalyst 1, monitors the oxygen level in the exhaust gas on each bank.

Even if switching characteristics of the heated oxygen 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 1V in richer conditions to 0V in leaner conditions.

Under normal conditions the heated oxygen sensor 2 is not used for engine control operation.



CONSULT-II Reference Value in Data Monitor Mode

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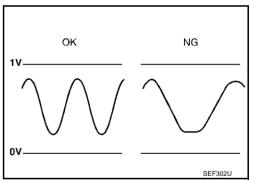
Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
HO2S2 (B1) HO2S2 (B2)	Warm-up condition After keeping engine speed	Revving engine from idle to 3,000 rpm	0 - 0.3V ←→ Approx. 0.6 - 1.0V
HO2S2 MNTR (B1) HO2S2 MNTR (B2)	between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	quickly.	$LEAN \longleftrightarrow RICH$

On Board Diagnosis Logic

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The heated oxygen sensor 2 has a much longer switching time between rich and lean than the heated oxygen sensor 1. The oxygen storage capacity before the three way catalyst 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 the various driving condition such as fuel-cut.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0139 0139 (Bank 1)	- Heated oxygen sensor	It takes more time for the sensor to respond	 Harness or connectors (The sensor circuit is open or shorted) Heated oxygen sensor 2
P0159 0159 (Bank 2)	2 circuit slow response	between rich and lean than the specified time.	Fuel pressureInjectorsIntake air leaks

Revision; 2004 April EC-253 2003 G35 Sedan

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DTC Confirmation Procedure

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NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

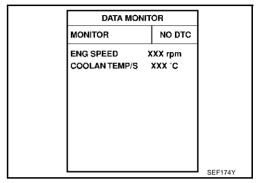
(WITH CONSULT-II

TESTING CONDITION:

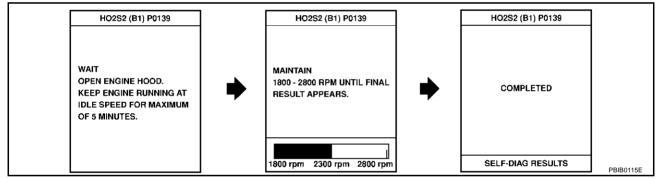
For better results, perform "DTC WORK SUPPORT" at a temperature of 0 to 30 °C (32 to 86 °F).

- Turn ignition switch "ON" and select "DATA MONITOR" mode with CONSULT-II.
- 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 minutes.
- 6. 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).



- Select "HO2S2 (B1) P0139" or "HO2S2 (B2) P0159" of "HO2S2" in "DTC WORK SUPPORT" mode with CONSULT-II.
- 8. Start engine and following the instruction of CONSULT-II.



- 9. Make sure that "OK" is displayed after touching "SELF-DIAG RESULTS".
 - If "NG" is displayed, refer to EC-259, "Diagnostic Procedure".
 - If "CAN NOT BE DIAGNOSED" is displayed, perform the following.
- Turn ignition switch "OFF" and leave the vehicle in a cool place (soak the vehicle).
- b. Return to step 1.

Overall Function Check

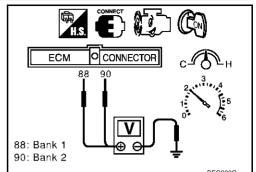
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Use this procedure to check the overall function of the heated oxygen sensor 2 circuit. During this check, a DTC might not be confirmed.

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 minutes.
- 5. Set voltmeter probes between ECM terminal 88 [HO2S2 (B1) signal] or 90 [HO2S2 (B2) signal] and engine ground.

- 6. Check the voltage when revving up to 4,000 rpm under no load at least 10 times.
 - (Depress and release accelerator pedal as soon as possible.) A change of voltage should be more than 0.06V for 1 second during this procedure.
 - If the voltage can be confirmed in step 6, step 7 is not necessary.
- 7. Keep vehicle at idling for 10 minutes, then check the voltage. Or check the voltage when coasting from 80 km/h (50 MPH) in "D" position.
 - A change of voltage should be more than 0.06V for 1 second during this procedure.
- 8. If NG, go to EC-259, "Diagnostic Procedure".



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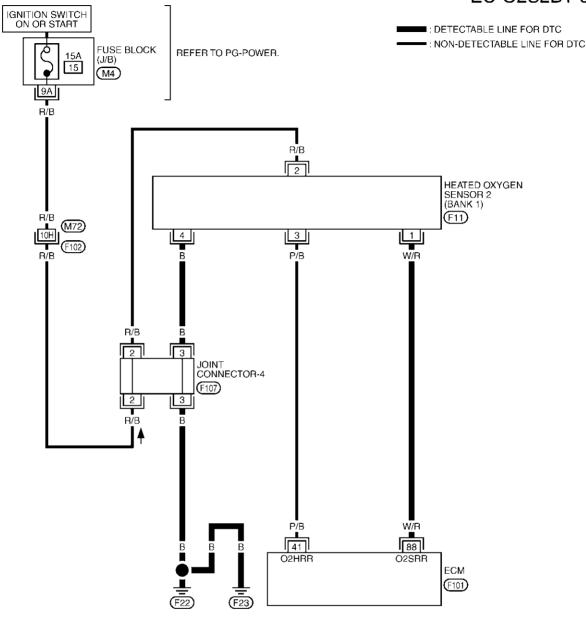
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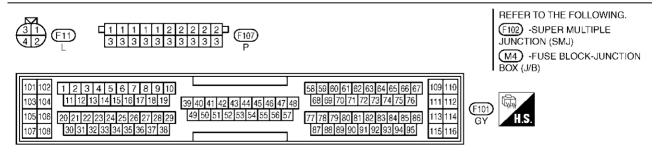
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Wiring Diagram
BANK 1

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EC-O2S2B1-01





TBWT0319E

DTC P0139, P0159 HO2S2

[TYPE 1]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

			· · · · · · · · · · · · · · · · · · ·	
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
			[Engine is running] • Warm-up condition	
88	W/R	Heated oxygen sensor 2 (bank 1)	 Revving engine from idle to 3,000 rpm quickly after the following conditions are met. 	0 - Approximately 1.0V
			 After keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load. 	

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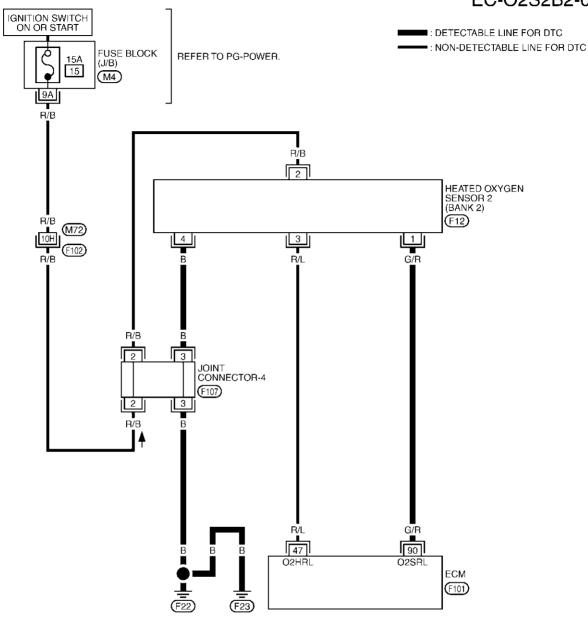
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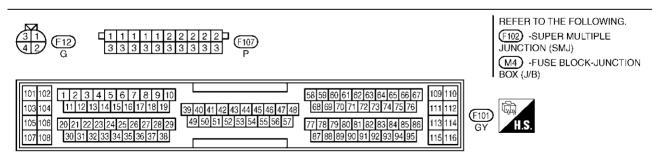
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BANK 2

EC-O2S2B2-01





TBWT0320E

DTC P0139, P0159 HO2S2

[TYPE 1]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

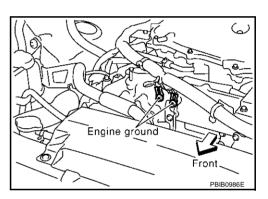
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
90	G/R	Heated oxygen sensor 2 (bank 2)	 [Engine is running] Warm-up condition Revving engine from idle to 3,000 rpm quickly after the following conditions are 	0 - Approximately 1.0V
		(Dalik Z)	 met. After keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load. 	

Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

- 1. Turn ignition switch "OFF".
- 2. Loosen and retighten engine ground screws.

>> GO TO 2.



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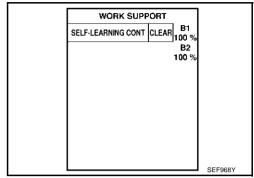
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2. CLEAR THE SELF-LEARNING DATA

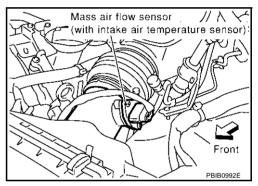
(II) With CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- 2. Select "SELF-LEARNING CONT" in "WORK SUPPORT" mode with CONSULT-II.
- 3. Clear the self-learning control coefficient by touching "CLEAR".
- 4. 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?



(R) Without CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- 2. Turn ignition switch "OFF".
- 3. Disconnect mass air flow sensor harness connector, and restart and run engine for at least 5 seconds at idle speed.
- Stop engine and reconnect mass air flow sensor harness connector.
- 5. Make sure DTC P0102 is displayed.
- 6. Erase the DTC memory. Refer to <u>EC-69</u>, "<u>HOW TO ERASE</u> EMISS<u>ION-RELATED DIAGNOSTIC INFORMATION</u>".
- 7. Make sure DTC P0000 is displayed.
- 8. 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 or No

Yes \Rightarrow Perform trouble diagnosis for DTC P0171, P0174 or P0172, P0175. Refer to <u>EC-264</u> or <u>EC-273</u>. No \Rightarrow GO TO 3.

3. CHECK HO2S2 GROUND CIRCUIT FOR OPEN AND SHORT

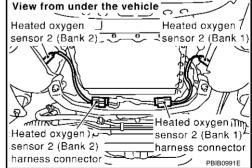
- 1. Turn ignition switch "OFF".
- 2. Disconnect heated oxygen sensor 2 harness connector.
- Check harness continuity between HO2S2 terminal 4 and engine ground. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to power.

OK or NG

OK >> GO TO 5. NG >> GO TO 4.



4. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-4
- Harness for open or short between HO2S2 and engine ground

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

5. CHECK HO2S2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Disconnect ECM harness connector.
- Check harness continuity between ECM terminal and HO2S2 terminal as follows. Refer to Wiring Diagram.

DTC	Term	Bank		
ыс	ECM	Sensor	Dank	
P0138	88	1	1	
P0158	90	1	2	

Continuity should exist.

3. Check harness continuity between the following terminals and ground. Refer to Wiring Diagram.

DTC	Terminals		Bank
ыс	ECM	Sensor	Dank
P0138	88	1	1
P0158	90	1	2

Continuity should not exist.

4. Also check harness for short to power.

OK or NG

OK >> GO TO 7.

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

6. CHECK HEATED OXYGEN SENSOR 2

Refer to EC-261, "Component Inspection".

OK or NG

OK >> GO TO 8.

NG >> Replace malfunctioning heated oxygen sensor 2.

7. CHECK INTERMITTENT INCIDENT

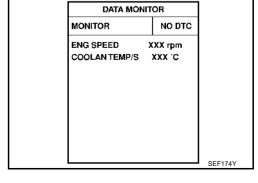
Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

Component Inspection HEATED OXYGEN SENSOR 2

(P) With CONSULT-II

- 1. Turn ignition switch "ON" and select "DATA MONITOR" mode with CONSULT-II.
- 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.
- 5. Let engine idle for 1 minutes.



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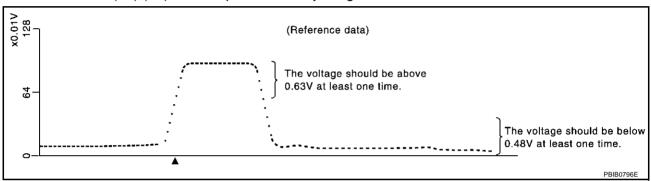
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6. Select "FUEL INJECTION" in "ACTIVE TEST" mode, and select "HO2S2 (B1)/(B2)" as the monitor item with CONSULT-II.

ACTIVE TES		
FUEL INJECTION	25 %	
MONITOR		
ENG SPEED	XXX rpm	
HO2S1 (B1)	xxx v	
HO2S2 (B1)	xxx v	
HO2S1 MNTR (B1)	RICH	
HO2S2 MNTR (B1)	RICH	
		SEF662Y

Check "HO2S2 (B1)/(B2)" at idle speed when adjusting "FUEL INJECTION" to ±25%.



"HO2S2 (B1)/(B2)" should be above 0.63V at least once when the "FUEL INJECTION" is +25%. "HO2S2 (B1)/(B2)" should be below 0.48V at least once when the "FUEL INJECTION" is -25%.

CAUTION:

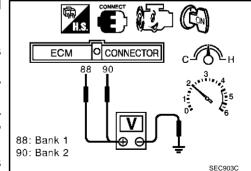
- Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved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

⋈ Without CONSULT-II

- 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 minutes.
- 5. Set voltmeter probes between ECM terminal 88 [HO2S2 (B1) signal] or 90 [HO2S2 (B2) signal] and engine ground.
- Check the voltage when revving up to 4,000 rpm under no load at least 10 times.
 - (Depress and release accelerator pedal as soon as possible.)

 The voltage should be above 0.63V at least once during this

 procedure.
 - If the voltage is above 0.63V at step 6, step 7 is not necessary.
- Keep vehicle at idling for 10 minutes, then check voltage. Or check the voltage when coasting from 80 km/h (50 MPH) in "D" position.
 - The voltage should be below 0.48V at least once during this procedure.
- 8. If NG, replace 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 tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.

DTC P0139, P0159 HO2S2

[TYPE 1]

Removal and Installation HEATED OXYGEN SENSOR 2

ABS0007U

Refer to EM-24, "EXHAUST MANIFOLD AND THREE WAY CATALYST".

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[TYPE 1]

DTC P0171, P0174 FUEL INJECTION SYSTEM FUNCTION

PFP:16600

On Board Diagnosis Logic

ABS0007V

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 the heated oxygen sensors 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 lights up the MIL (2 trip detection logic).

Sensor	Input signal to ECM	ECM function	Actuator
Heated oxygen sensors 1	Density of oxygen in exhaust gas (Mixture ratio feedback signal)	Fuel injection control	Fuel injectors

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0171 0171 (Bank 1)			Intake air leaksHeated oxygen sensor 1
P0174 0174 (Bank 2)	Fuel injection system too lean	 Fuel injection system does not operate properly. The amount of mixture ratio compensation is too large. (The mixture ratio is too lean.) 	 Injectors Exhaust gas leaks Incorrect fuel pressure Lack of fuel Mass air flow sensor Incorrect PCV hose connection

DTC Confirmation Procedure

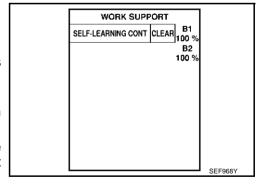
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NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

(P) WITH CONSULT-II

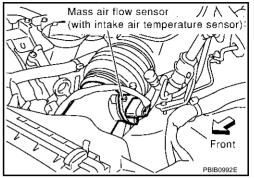
- 1. Start engine and warm it up to normal operating temperature.
- 2. Turn ignition switch "OFF" and wait at least 10 seconds.
- 3. Turn ignition switch "ON" and select "SELF-LEARNING CONT" in "WORK SUPPORT" mode with CON-SULT-II.
- 4. Clear the self-learning control coefficient by touching "CLEAR".
- Select "DATA MONITOR" mode with CONSULT-II.
- Start engine again and let it idle for at least 10 minutes.
 The 1st trip DTC P0171 or P0174 should be detected at this stage, if a malfunction exists. If so, go to "Diagnostic Procedure", EC-268.
- 7. If it is difficult to start engine at step 6, the fuel injection system has a malfunction, too.
- Crank engine while depressing accelerator pedal. If engine starts, go to "Diagnostic Procedure", <u>EC-268</u>. If engine does not start, check exhaust and intake air leak visually.



[TYPE 1]

® 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. Disconnect mass air flow sensor harness connector. Then restart and run engine for at least 5 seconds at idle speed.
- 4. Stop engine and reconnect mass air flow sensor harness connector.
- 5. Select "MODE 3" with GST. Make sure DTC P0102 is detected.
- Select "MODE 4" with GST and erase the DTC P0102.
- 7. Start engine again and let it idle for at least 10 minutes.
- 8. Select "MODE 7" with GST. The 1st trip DTC P0171 or P0174 should be detected at this stage, if a malfunction exists. If so, go to "Diagnostic Procedure", <u>EC-268</u>.
- 9. If it is difficult to start engine at step 7, the fuel injection system has a malfunction.
- 10. Crank engine while depressing accelerator pedal. If engine starts, go to "Diagnostic Procedure", <u>EC-268</u>. If engine does not start, check exhaust and intake air leak visually.



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Wiring Diagram BANK 1 ABS0007X EC-FUELB1-01 IGNITION SWITCH ON OR START FUSE BLOCK REFER TO PG-POWER. (J/B) 15A 15 1 $\overline{M4}$ 9A R/B : DETECTABLE LINE FOR DTC : NON-DETECTABLE LINE FOR DTC $\overline{M72}$ 10H R/B (F102 2 JOINT CONNECTOR-4 (F107) 2 B/B 4 2 HEATED **INJECTOR INJECTOR INJECTOR** 9 OXYGEN SENSOR 1 (BANK 1) 9 NO.1 NO.3 NO.5 (F224) (F222) (F223) (F17) L/W (F33) W L/W 91 1 3 12 39 ECM (F101) (F22) (F23) REFER TO THE FOLLOWING. (F102) -SUPER MULTIPLE JUNCTION (SMJ) (M4) -FUSE BLOCK-JUNCTION F222 , F223 , F224 GY GY GY 1 2 3 4 5 6 7 8 9 10 58 59 60 61 62 63 64 65 66 67 109 110 11 12 13 14 15 16 17 18 19 68 69 70 71 72 73 74 75 76 111 112 103 104 39 40 41 42 43 44 45 46 47 48 (F101) 49 50 51 52 53 54 55 56 57 105 106 113 114 20 21 22 23 24 25 26 27 28 29 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 30 31 32 33 34 35 36 37 38

TBWT0321E

BANK 2 Α EC-FUELB2-01 IGNITION SWITCH ON OR START FUSE BLOCK EC REFER TO PG-POWER. (J/B) 1 15 (M4)9A C R/B ■ : DETECTABLE LINE FOR DTC : NON-DETECTABLE LINE FOR DTC D M72 10H R/B Е (F33) 2 5 JOINT CONNECTOR-4 (F221) F (F107) 3 2 R/B G Н R/B 2 4 HEATED OXYGEN SENSOR 1 INJECTOR NO.2 **INJECTOR** INJECTOR 8 K00 NO.4 NO.6 (F225) (F226) (F227) (BANK 2) 2 (F30) 3 ш PU/R GΥ F221 13 (F33) K R/W R/L 92 13 40 2 11 ЕСМ (F101) (F22) (F23) M REFER TO THE FOLLOWING. 1 1 1 1 1 2 2 2 2 2 7 F107 P (F102) -SUPER MULTIPLE (F33) JUNCTION (SMJ) M4 -FUSE BLOCK-JUNCTION BOX (J/B) 2 1 (F225), (F226), (F227) GY GY GY 1 2 3 4 5 6 7 8 9 10 58 59 60 61 62 63 64 65 66 67 109 110 103 11 12 13 14 15 16 17 18 19 68 69 70 71 72 73 74 75 76 104 111 112 39 40 41 42 43 44 45 46 47 48 (F101)

TBWT0322E

77 78 79 80 81 82 83 84 85 86

87 88 89 90 91 92 93 94 95

113 114

GY

49 50 51 52 53 54 55 56 57

105 106

20 21 22 23 24 25 26 27 28 29

30 31 32 33 34 35 36 37 38

[TYPE 1]

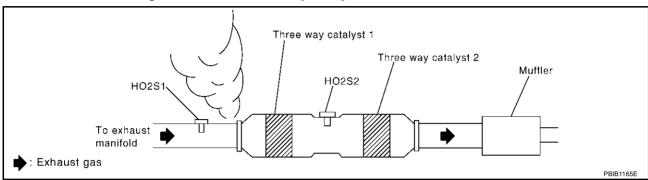
ABS0007Y

Diagnostic Procedure

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.



OK or NG

OK >> GO TO 2.

NG >> Repair or replace.

2. CHECK FOR INTAKE AIR LEAK

1. Listen for an intake air leak after the mass air flow sensor.

2. Check PCV hose connection.

OK or NG

OK >> GO TO 3.

NG >> Repair or replace.

[TYPE 1]

3. CHECK HEATED OXYGEN SENSOR 1 CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch "OFF".
- 2. Disconnect corresponding heated oxygen sensor 1 (HO2S1) harness connector.
- Disconnect ECM harness connector.
- 4. Check harness continuity between ECM terminal and HO2S1 terminal as follows. Refer to Wiring Diagram.

DTC	Tern	Bank	
ыс	ECM	Sensor	Dalik
P0171	91	1	1
P0174	92	1	2

Continuity should exist.

5. Check harness continuity between the following terminals and ground. Refer to Wiring Diagram.

DTC	Terminals		Bank	
ыс	ECM	Sensor	Dalik	
P0171	91	1	1	
P0174	92	1	2	

Continuity should not exist.

6. Check harness continuity between HO2S1 terminal 4 and engine ground.

Continuity should exist.

7. Also check harness for short to power.

OK or NG

OK >> GO TO 5. NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-4
- Harness for open or short between ECM and HO2S1
- Harness for open or short between HO2S1 and engine ground

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

5. CHECK FUEL PRESSURE

- Release fuel pressure to zero. Refer to <u>EC-53, "FUEL PRESSURE RELEASE"</u>.
- 2. Install fuel pressure gauge and check fuel pressure. Refer to EC-55, "FUEL PRESSURE CHECK".

At idling: 350 kPa (3.57 kg/cm², 51 psi)

OK or NG

OK >> GO TO 7. NG >> GO TO 6. EC

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2003 G35 Sedan

[TYPE 1]

6. DETECT MALFUNCTIONING PART

Check the following.

- Fuel pump and circuit (Refer to EC-611 .)
- Fuel pressure regulator (Refer to EC-55.)
- Fuel lines
- Fuel filter for clogging
 - >> Repair or replace.

7. CHECK MASS AIR FLOW SENSOR

(P) With CONSULT-II

- 1. Install all removed parts.
- 2. Check "MASS AIR FLOW" in "DATA MONITOR" mode with CONSULT-II.

2.0 - 6.0 g·m/sec: at idling 7.0 - 20.0 g·m/sec: at 2,500 rpm

With GST

- 1. Install all removed parts.
- 2. Check mass air flow sensor signal in MODE 1 with GST.

2.0 - 6.0 g·m/sec: at idling 7.0 - 20.0 g·m/sec: at 2,500 rpm

OK or NG

OK >> GO TO 8.

NG >> Check connectors for rusted terminals or loose connections in the mass air flow sensor circuit or engine grounds. Refer to EC-170, "DTC P0101 MAF SENSOR".

[TYPE 1]

8. CHECK FUNCTION OF INJECTORS

(P) With CONSULT-II

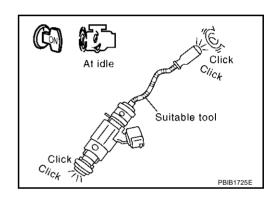
- Start engine.
- Perform "POWER BALANCE" in "ACTIVE TEST" mode with CONSULT-II.
- 3. Make sure that each circuit produces a momentary engine speed drop.

ACTIVE TES		
POWER BALANCE		
MONITOR		
ENG SPEED	XXX rpm	
MAS A/F SE-B1	xxx v	
		PBIB0133E

(R) Without CONSULT-II

- 1. Start engine.
- 2. Listen to each injector operating sound.

Clicking noise should be heard.



OK or NG

OK >> GO TO 9.

NG >> Perform trouble diagnosis for "INJECTORS", <u>EC-601</u>.

9. CHECK INJECTOR

- 1. Confirm that the engine is cooled down and there are no fire hazards near the vehicle.
- 2. Turn ignition switch "OFF".
- Disconnect all injector harness connectors.
- Remove injector gallery assembly. Refer to EM-37, "FUEL INJECTOR AND FUEL TUBE". Keep fuel hose and all injectors connected to injector gallery.
- For DTC P0171, reconnect injector harness connectors on bank 1. For DTC P0174, reconnect injector harness connectors on bank 2.
- Disconnect all ignition coil harness connectors.
- 7. Prepare pans or saucers under each injector.
- Crank engine for about 3 seconds. For DTC P0171, make sure that fuel sprays out from injectors

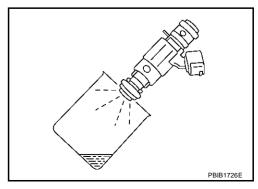
For DTC P0174, make sure that fuel sprays out from injectors on bank 4.

Fuel should be sprayed evenly for each injector.

OK or NG

OK >> GO TO 10.

>> Replace injectors from which fuel does not spray out. NG Always replace O-ring with new ones.



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[TYPE 1]

10. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

[TYPE 1]

DTC P0172, P0175 FUEL INJECTION SYSTEM FUNCTION

PFP:16600

On Board Diagnosis Logic

ABS00077

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 the heated oxygen sensors 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 lights up the MIL (2 trip detection logic).

Sensor	Input signal to ECM	ECM function	Actuator
Heated oxygen sensors 1	Density of oxygen in exhaust gas (Mixture ratio feedback signal)	Fuel injection control	Fuel injectors

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0172 0172 (Bank 1)	Fuel injection system	 Fuel injection system does not operate properly. The amount of mixture ratio compensation is too large. (The mixture ratio is too rich.) 	Heated oxygen sensor 1InjectorsExhaust gas leaks
P0175 0175 (Bank 2)	too rich		Incorrect fuel pressureMass air flow sensor

DTC Confirmation Procedure

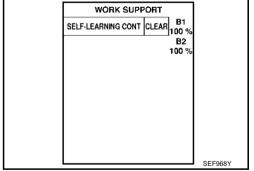
ABS00080

NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

WITH CONSULT-II

- 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" and select "SELF-LEARNING CONT" in "WORK SUPPORT" mode with CON-3. SULT-II.
- 4. Clear the self-learning control coefficient by touching "CLEAR".
- Select "DATA MONITOR" mode with CONSULT-II.
- Start engine again and let it idle for at least 10 minutes. The 1st trip DTC P0172, P0175 should be detected at this stage, if a malfunction exists. If so, go to "Diagnostic Procedure", EC-
- 7. If it is difficult to start engine at step 6, the fuel injection system has a malfunction, too.
- Crank engine while depressing accelerator pedal. If engine starts, go to "Diagnostic Procedure", EC-277. If engine does not start, remove ignition plugs and check for fouling, etc.



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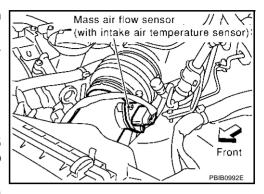
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[TYPE 1]

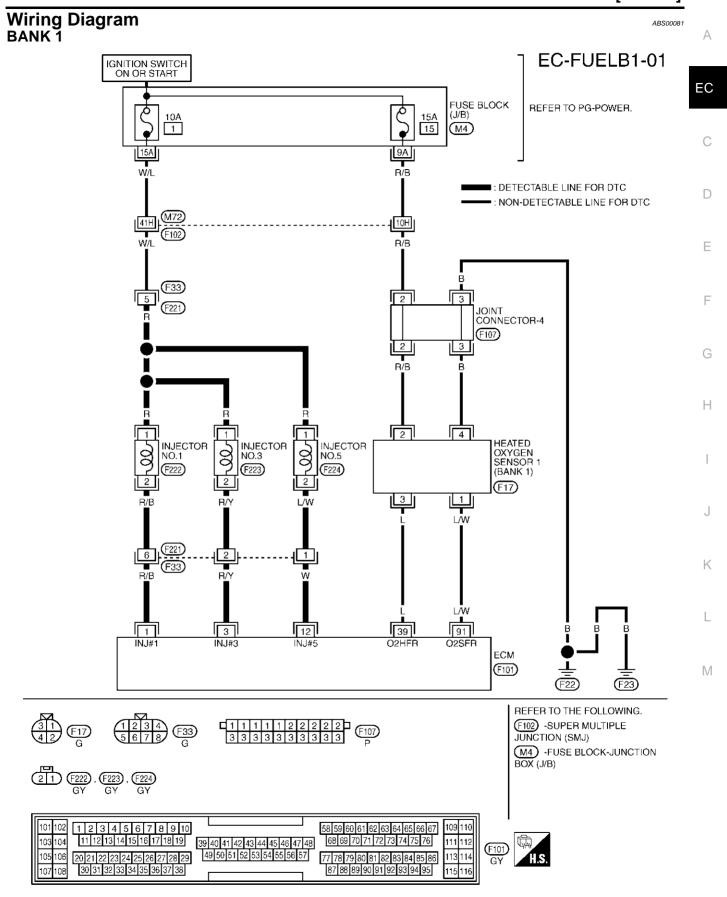
® WITH GST

- 1. Start engine and warm it up to normal operating temperature.
- 2. Turn ignition switch "OFF" and wait at least 10 seconds.
- 3. Disconnect mass air flow sensor harness connector. Then restart and run engine for at least 5 seconds at idle speed.
- 4. Stop engine and reconnect mass air flow sensor harness connector.
- 5. Select "MODE 3" with GST. Make sure DTC P0102 is detected.
- 6. Select "MODE 4" with GST and erase the DTC P0102.
- 7. Start engine again and let it idle for at least 10 minutes.
- 8. Select "MODE 7" with GST. The 1st trip DTC P0172 or P0175 should be detected at this stage, if a malfunction exists. If so, go to "Diagnostic Procedure", <u>EC-277</u>.
- 9. If it is difficult to start engine at step 7, the fuel injection system has a malfunction.



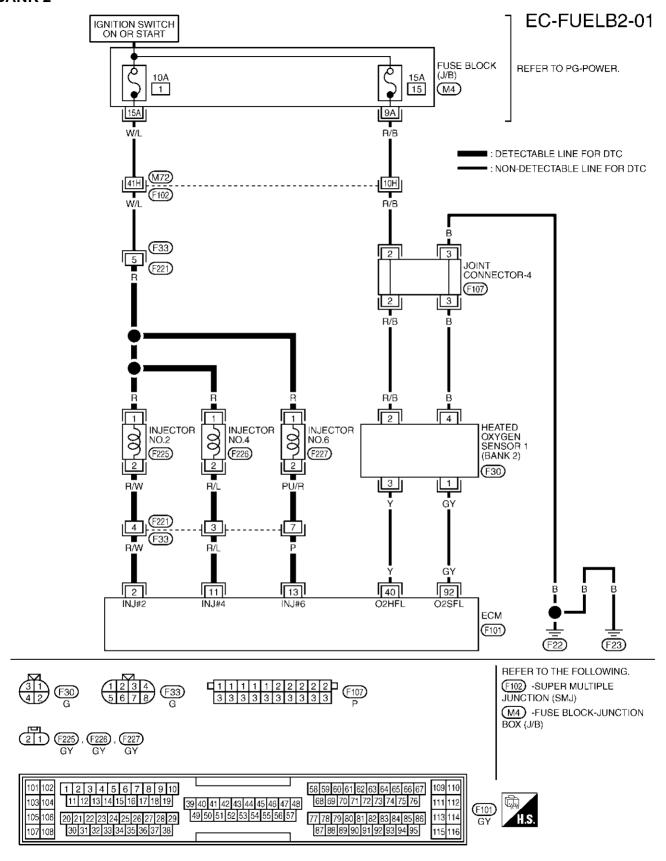
Crank engine while depressing accelerator pedal.
 If engine starts, go to "Diagnostic Procedure", <u>EC-277</u>. If engine does not start, remove ignition plugs and check for fouling, etc.

[TYPE 1]



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BANK 2



TBWT0322E

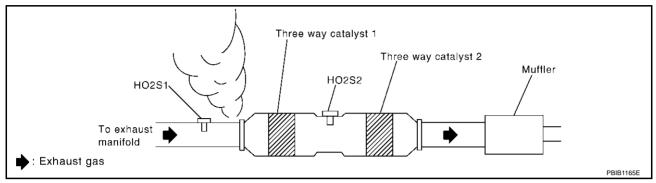
[TYPE 1]

ABS00082

Diagnostic Procedure

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.



OK or NG

OK >> GO TO 2.

NG >> Repair or replace.

2. CHECK FOR INTAKE AIR LEAK

Listen for an intake air leak after the mass air flow sensor.

OK or NG

OK >> GO TO 3.

NG >> Repair or replace.

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3. CHECK HEATED OXYGEN SENSOR 1 CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch "OFF".
- 2. Disconnect corresponding heated oxygen sensor 1 (HO2S1) harness connector.
- 3. Disconnect ECM harness connector.
- 4. Check harness continuity between ECM terminal and HO2S1 terminal as follows. Refer to Wiring Diagram.

DTC	Terminals		Bank	
DIC	ECM	Sensor	Dalik	
P0172	91	1	1	
P0175	92	1	2	

Continuity should exist.

Check harness continuity between the following terminals and ground. Refer to Wiring Diagram.

DTC	Tern	Bank		
ыс	ECM	Sensor	Dalik	
P0172	91	1	1	
P0175	92	1	2	

Continuity should not exist.

6. Check harness continuity between HO2S1 terminal 4 and engine ground.

Continuity should exist.

7. Also check harness for short to power.

OK or NG

OK >> GO TO 5. NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-4
- Harness for open or short between ECM and HO2S1
- Harness for open or short between HO2S1 and engine ground
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK FUEL PRESSURE

- Release fuel pressure to zero. Refer to EC-53, "FUEL PRESSURE RELEASE".
- 2. Install fuel pressure gauge and check fuel pressure. Refer to EC-55, "FUEL PRESSURE CHECK".

At idling: 350 kPa (3.57 kg/cm², 51 psi)

OK or NG

OK >> GO TO 7. NG >> GO TO 6.

[TYPE 1]

6. DETECT MALFUNCTIONING PART

Check the following.

- Fuel pump and circuit (Refer to, <u>EC-611</u>.)
- Fuel pressure regulator (Refer to EC-55.)

>> Repair or replace.

7. CHECK MASS AIR FLOW SENSOR

(P) With CONSULT-II

- 1. Install all removed parts.
- 2. Check "MASS AIR FLOW" in "DATA MONITOR" mode with CONSULT-II.

2.0 - 6.0 g·m/sec: at idling 7.0 - 20.0 g·m/sec: at 2,500 rpm

(a) With GST

- 1. Install all removed parts.
- 2. Check mass air flow sensor signal in MODE 1 with GST.

2.0 - 6.0 g·m/sec: at idling 7.0 - 20.0 g·m/sec: at 2,500 rpm

OK or NG

OK >> GO TO 8.

NG >> Check connectors for rusted terminals or loose connections in the mass air flow sensor circuit or engine grounds. Refer to EC-170, "DTC P0101 MAF SENSOR".

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8. CHECK FUNCTION OF INJECTORS

(P) With CONSULT-II

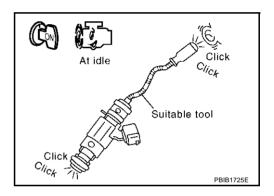
- Start engine.
- 2. Perform "POWER BALANCE" in "ACTIVE TEST" mode with CONSULT-II.
- 3. Make sure that each circuit produces a momentary engine speed drop.

ACTIVE TES	T	
POWER BALANCE		
MONITOR		
ENG SPEED	XXX rpm	
MAS A/F SE-B1	xxx v	
	+	
		PBIB013

(R) Without CONSULT-II

- 1. Start engine.
- 2. Listen to each injector operating sound.

Clicking noise should be heard.



OK or NG

OK >> GO TO 9.

NG >> Perform trouble diagnosis for "INJECTORS", <u>EC-601</u>.

9. CHECK INJECTOR

- Remove injector assembly. Refer to <u>EM-37</u>, "<u>FUEL INJECTOR AND FUEL TUBE</u>". Keep fuel hose and all injectors connected to injector gallery.
- 2. Confirm that the engine is cooled down and there are no fire hazards near the vehicle.
- 3. Disconnect all injector harness connectors.
- 4. Disconnect all ignition coil harness connectors.
- 5. Prepare pans or saucers under each injectors.
- Crank engine for about 3 seconds. Make sure fuel does not drip from injector.

OK or NG

OK (Does not drip.)>>GO TO 10.

NG (Drips.)>>Replace the injectors from which fuel is dripping. Always replace O-ring with new one.

10. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

DTC P0181 FTT SENSOR

PFP:22630

Component Description

ABS00083

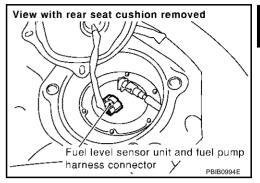
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The fuel tank temperature sensor is used to detect the fuel temperature inside the fuel tank. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the fuel temperature input. The sensor uses a thermistor which 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 $k\Omega$
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 terminal 75 (Fuel tank temperature sensor) and ground.

CAUTION:

Do not 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.

On Board Diagnosis Logic

ABS00084

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0181 0181	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

DTC Confirmation Procedure

ABS00085

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NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

(II) WITH CONSULT-II

- Turn ignition switch "ON".
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- Wait at least 10 seconds.
 If the result is NG, go to <u>EC-284, "Diagnostic Procedure"</u>.
 If the result is OK, go to following step.
- Check "COOLAN TEMP/S" value.
 If "COOLAN TEMP/S" is less than 60°C (140°F), the result will be OK.
 If "COOLAN TEMP/S" is above 60°C (140°F), go to the following step.
- 5. Cool engine down until "COOLAN TEMP/S" is less than 60°C (140°F).
- Wait at least 10 seconds.
- 7. If 1st trip DTC is detected, go to <u>EC-284, "Diagnostic Procedure".</u>

DATA MONITOR
MONITOR
NO DTC
ENG SPEED XXX rpm
COOLAN TEMP/S XXX *C

DTC P0181 FTT SENSOR

[TYPE 1]

WITH GST

Follow the procedure "WITH CONSULT-II" above.

Wiring Diagram

54321 B27 GY

101 102

103 104

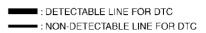
105 106

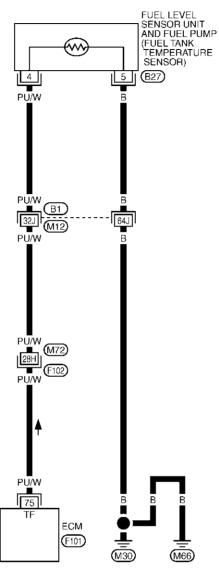
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19

20 21 22 23 24 25 26 27 28 29

30 31 32 33 34 35 36 37 38

EC-FTTS-01





REFER TO THE FOLLOWING. (F102), (B1) -SUPER MULTIPLE JUNCTION (SMJ)

109 110

111 112

(F101)

TBWT0147E

58 59 60 61 62 63 64 65 66 67

68 69 70 71 72 73 74 75 76

77 78 79 80 81 82 83 84 85 86

87 88 89 90 91 92 93 94 95

39 40 41 42 43 44 45 46 47 48

49 50 51 52 53 54 55 56 57

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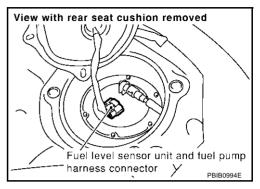
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Diagnostic Procedure

AB\$00087

1. CHECK FUEL TANK TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

- 1. Turn ignition switch "OFF".
- 2. Disconnect fuel level sensor unit and fuel pump harness connector.
- 3. Turn ignition switch "ON".

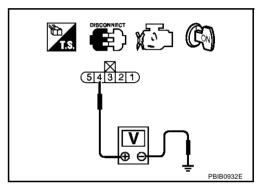


4. Check voltage between fuel level sensor unit and fuel pump terminal 4 and ground with CONSULT-II or tester.

Voltage: Approximately 5V

OK or NG

OK >> GO TO 3. NG >> GO TO 2.



2. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B1, M12
- Harness connectors M72, F102
- Harness for open or short between ECM and fuel level sensor unit and fuel pump
 - >> Repair harness or connector.

3. CHECK FUEL TANK TEMPERATURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch "OFF".
- 2. Check harness continuity between fuel level sensor unit and fuel pump terminal 5 and body ground. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 5. NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B1, M12
- Harness for open or short between fuel level sensor unit and fuel pump and body ground
 - >> Repair open circuit or short to power in harness or connector.

DTC P0181 FTT SENSOR

[TYPE 1]

5. CHECK FUEL TANK TEMPERATURE SENSOR

Refer to EC-285, "Component Inspection".

OK or NG

OK >> GO TO 6.

NG >> Replace fuel level sensor unit.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

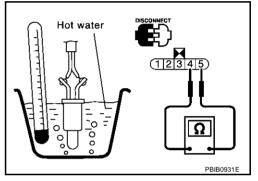
>> INSPECTION END

Component Inspection FUEL TANK TEMPERATURE SENSOR

Remove fuel level sensor unit.

Check resistance between fuel level sensor unit and fuel pump terminals 4 and 5 by heating with hot water or heat gun as shown in the figure.

Temperature °C (°F)	Resistance kΩ
20 (68)	2.3 - 2.7
50 (122)	0.79 - 0.90



Removal and Installation **FUEL TANK TEMPERATURE SENSOR**

Refer to FL-5, "FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY".

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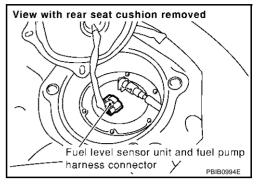
DTC P0182, P0183 FTT SENSOR

PFP:22630

Component Description

ABS0008A

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 terminal 75 (Fuel tank temperature sensor) and ground.

CAUTION:

Do not 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.

On Board Diagnosis Logic

ABS0008B

	DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
•	P0182 0182	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 0183	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

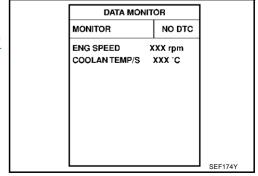
ABS0008C

NOTE

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

(P) WITH CONSULT-II

- 1. Turn ignition switch "ON".
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- Wait at least 5 seconds.
- If 1st trip DTC is detected, go to <u>EC-288</u>, "<u>Diagnostic Procedure</u>"



WITH GST

Follow the procedure "With CONSULT-II" above.

Wiring Diagram

54321 B27 GY

101 102

103 104

105 106

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19

20 21 22 23 24 25 26 27 28 29

30 31 32 33 34 35 36 37 38

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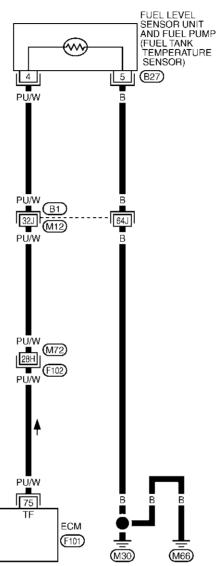
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EC-FTTS-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC



REFER TO THE FOLLOWING.

F102, B1 -SUPER MULTIPLE

JUNCTION (SMJ)

109 110

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(F101)

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58 59 60 61 62 63 64 65 66 67

68 69 70 71 72 73 74 75 76

77 78 79 80 81 82 83 84 85 86

87 88 89 90 91 92 93 94 95

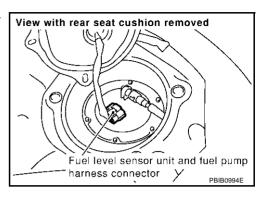
39 40 41 42 43 44 45 46 47 48

49 50 51 52 53 54 55 56 57

Diagnostic Procedure

1. CHECK FUEL TANK TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

- 1. Turn ignition switch "OFF".
- 2. Disconnect fuel level sensor unit and fuel pump harness connector.
- 3. Turn ignition switch "ON".

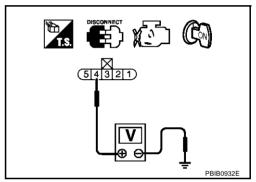


4. Check voltage between fuel level sensor unit and fuel pump terminal 4 and ground with CONSULT-II or tester.

Voltage: Approximately 5V

OK or NG

OK >> GO TO 3. NG >> GO TO 2.



2. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B1, M12
- Harness connectors M72, F102
- Harness for open or short between ECM and fuel level sensor unit and fuel pump
 - >> Repair harness or connector.

3. CHECK FUEL TANK TEMPERATURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch "OFF".
- 2. Check harness continuity between fuel level sensor unit and fuel pump terminal 5 and body ground. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 5. NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B2, M12
- Harness for open or short between fuel level sensor unit and fuel pump and body ground

>> Repair open circuit or short to power in harness or connector.

DTC P0182, P0183 FTT SENSOR

[TYPE 1]

5. CHECK FUEL TANK TEMPERATURE SENSOR

Refer to EC-289, "Component Inspection".

OK or NG

OK >> GO TO 6.

NG >> Replace fuel level sensor unit.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

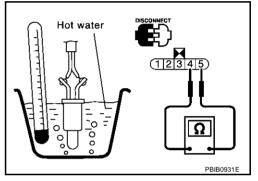
>> INSPECTION END

Component Inspection FUEL TANK TEMPERATURE SENSOR

Remove fuel level sensor unit.

2. Check resistance between fuel level sensor unit and fuel pump terminals 4 and 5 by heating with hot water or heat gun as shown in the figure.

Temperature °C (°F)	Resistance kΩ
20 (68)	2.3 - 2.7
50 (122)	0.79 - 0.90



Removal and Installation FUEL TANK TEMPERATURE SENSOR

Refer to FL-5, "FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY".

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DTC P0221 TP SENSOR

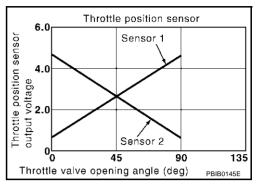
PFP:16119

Component Description

ABS0008H

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 the 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.



CONSULT-II Reference Value in Data Monitor Mode

ABS00081

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
THRTL SEN1	Ignition switch: ON	Accelerator pedal: Fully released	More than 0.36V
THRTL SEN2*	(Engine stopped) ● Shift lever: D	Accelerator pedal: Fully depressed	Less than 4.75V

^{*:} Throttle position sensor 2 signal is converted by ECM internally. Thus, it differs from ECM terminal voltage signal.

On Board Diagnosis Logic

ABS0008J

This self-diagnosis has the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0221 0221	Throttle position sensor circuit range/performance problem	Rationally incorrect voltage is sent to ECM compared with the signals from TP sensor 1 and TP sensor 2.	 Harness or connector (The TP sensor 1 and 2 circuit is open or shorted.) Electric throttle control actuator (TP sensor 1 and 2)

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode and the MIL lights up.

Engine operation condition in fail-safe mode

So, the acceleration will be poor.

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.

DTC P0221 TP SENSOR

[TYPE 1]

DTC Confirmation Procedure

ABS0008K

NOTE:

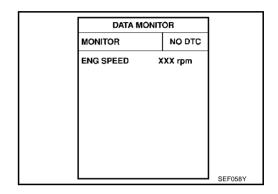
If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

(II) WITH CONSULT-II

- 1. Turn ignition switch "ON".
- Select "DATA MONITOR" mode with CONSULT-II.
- 3. Start engine and let it idle for 1 second.
- 4. If DTC is detected, go to EC-293, "Diagnostic Procedure" .



WITH GST

Follow the procedure "WITH CONSULT-II" above.

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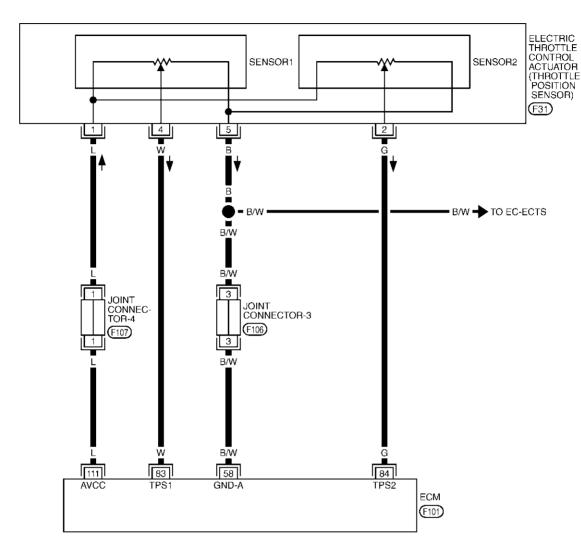
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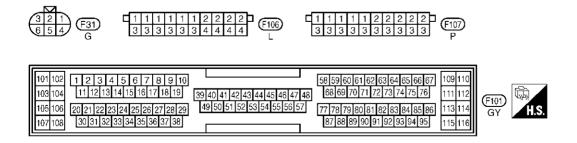
Wiring Diagram

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EC-TPS3-01







TBWT0148E

DTC P0221 TP SENSOR

[TYPE 1]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
			[Engine is running]	
58	B/W	Sensors' ground	Warm-up condition	Approximately 0V
			Idle speed	
			[Ignition switch "ON"]	
			Engine stopped	More than 0.36V
			Gear position: "D"	IVIOLE MAIL 0.30 V
83	w	Throttle position concer 1	Accelerator pedal fully released	
03	VV	Throttle position sensor 1	[Ignition switch "ON"]	
			Engine stopped	Less than 4.75V
			Gear position: "D"	Less than 4.75V
			Accelerator pedal fully depressed	
			[Ignition switch "ON"]	
			Engine stopped	Less than 4.75V
			Gear position: "D"	Less than 4.75V
84 G Throttle pos	T	Accelerator pedal fully released		
	Throttle position sensor 2	[Ignition switch "ON"]		
		Engine stopped	Mara than 0.26V	
		Gear position: "D"	More than 0.36V	
		Accelerator pedal fully depressed		
111	L	Sensors' power supply	[Ignition switch "ON"]	Approximately 5V

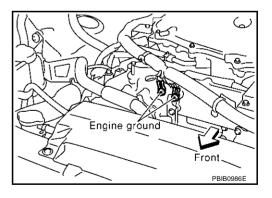
Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

1. Turn ignition switch "OFF".

2. Loosen and retighten engine ground screws.

>> GO TO 2.



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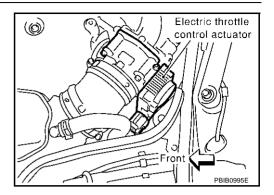
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$\overline{2}$. CHECK THROTTLE POSITION SENSOR POWER SUPPLY CIRCUIT

- 1. Disconnect electric throttle control actuator harness connector.
- 2. Turn ignition switch "ON".

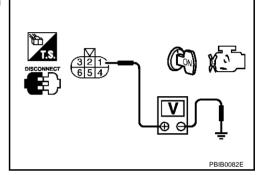


 Check voltage between electric throttle control actuator terminal 1 and ground with CONSULT-II or tester.

Voltage: Approximately 5V

OK or NG

OK >> GO TO 4. NG >> GO TO 3.



3. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-4
- Harness for open or short between electric throttle control actuator and ECM
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK THROTTLE POSITION SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch "OFF".
- Check harness continuity between electric throttle control actuator terminal 5 and engine ground. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 6. NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-3
- Harness for open or short between electric throttle control actuator and ECM
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK THROTTLE POSITION SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Disconnect ECM harness connector.
- Check harness continuity between ECM terminal 83 and electric throttle control actuator terminal 4, ECM terminal 84 and electric throttle control actuator terminal 2. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK

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

7. CHECK THROTTLE POSITION SENSOR

Refer to EC-295, "Component Inspection".

OK or NG

OK >> GO TO 9.

NG >> GO TO 8.

8. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

- 1. Replace the electric throttle control actuator.
- Perform EC-51, "Throttle Valve Closed Position Learning".
- 3. Perform EC-51, "Idle Air Volume Learning".

>> INSPECTION END

9. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

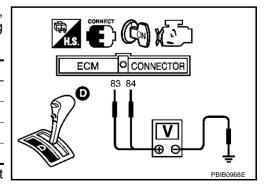
Component Inspection THROTTLE POSITION SENSOR

Reconnect all harness connectors disconnected.

- Perform EC-51, "Throttle Valve Closed Position Learning". 2.
- Turn ignition switch "ON".
- Set selector lever to "D" position.
- Check voltage between ECM terminals 83 (TP sensor 1 signal). 84 (TP sensor 2 signal) and engine ground under the following conditions.

Terminal	Accelerator pedal	Voltage
83	Fully released	More than 0.36V
(Throttle position sensor 1)	Fully depressed	Less than 4.75V
84	Fully released	Less than 4.75V
(Throttle position sensor 2)	Fully depressed	More than 0.36V

- If NG, replace electric throttle control actuator and go to the next step.
- 7. Perform EC-51, "Throttle Valve Closed Position Learning".
- Perform EC-51, "Idle Air Volume Learning".



EC-295 Revision; 2004 April 2003 G35 Sedan

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DTC P0221 TP SENSOR

[TYPE 1]

Removal and Installation ELECTRIC THROTTLE CONTROL ACTUATOR

Refer to EM-18, "INTAKE MANIFOLD COLLECTOR".

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DTC P0222, P0223 TP SENSOR

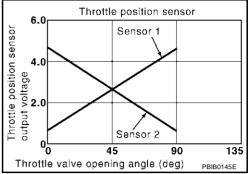
PFP:16119

Component Description

ABSOCORE

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 the 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.



CONSULT-II Reference Value in Data Monitor Mode

ABS0008Q

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
THRTL SEN1 THRTL SEN2*	Ignition switch: ON	Accelerator pedal: Fully released	More than 0.36V
	(Engine stopped)Shift lever: D	Accelerator pedal: Fully depressed	Less than 4.75V

^{*:} Throttle position sensor 2 signal is converted by ECM internally. Thus, it differs from ECM terminal voltage signal.

On Board Diagnosis Logic

ARSONORE

These self-diagnoses have the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	
P0222 0222	Throttle position sensor 1 circuit low input	An excessively low voltage from the TP sensor 1 is sent to ECM.	Harness or connectors (The TP sensor 1 circuit is open or	
P0223 0223	Throttle position sensor 1 circuit high input	An excessively high voltage from the TP sensor 1 is sent to ECM.	shorted.) • Electric throttle control actuator (TP sensor 1)	

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode an the MIL lights up.

Engine operation condition in fail-safe mode

The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10

The ECM regulates the opening speed of the throttle valve to be slower than the normal condition.

So, the acceleration will be poor.

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DTC Confirmation Procedure

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NOTE:

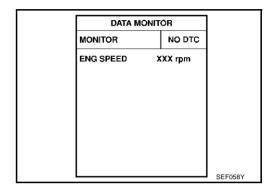
If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

(P) WITH CONSULT-II

- 1. Turn ignition switch "ON".
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- 3. Start engine and let it idle for 1 second.
- 4. If DTC is detected, go to EC-300, "Diagnostic Procedure".



WITH GST

Follow the procedure "WITH CONSULT-II" above.

Wiring Diagram

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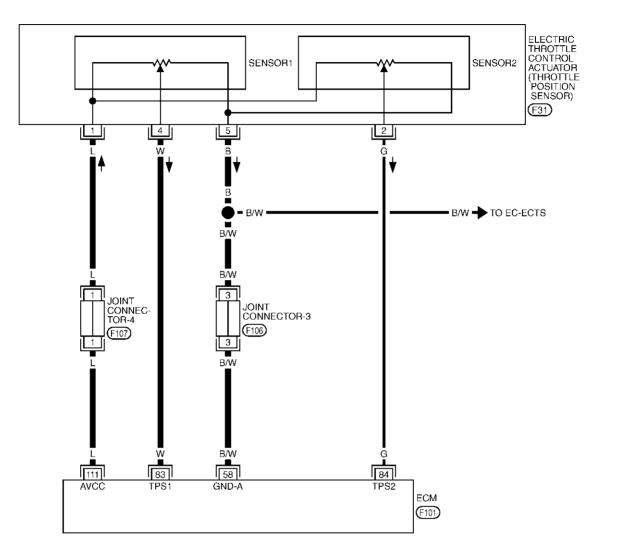
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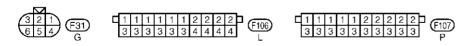
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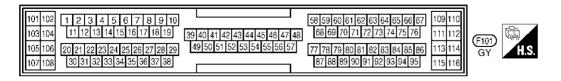
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EC-TPS1-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC







TBWT0149E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
			[Engine is running]	
58	B/W	Sensors' ground	Warm-up condition	Approximately 0V
			Idle speed	
			[Ignition switch "ON"]	
			Engine stopped	More than 0.36V
			Gear position: "D"	More than 0.56V
83	107	Throttle position concer 4	Accelerator pedal fully released	
83	W	Throttle position sensor 1	[Ignition switch "ON"]	
			Engine stopped	1 751
			Gear position: "D"	Less than 4.75V
			Accelerator pedal fully depressed	
			[Ignition switch "ON"]	
			Engine stopped	
			Gear position: "D"	Less than 4.75V
0.4			Accelerator pedal fully released	
84 G	Throttle position sensor 2	[Ignition switch "ON"]		
		Engine stopped	l	
		Gear position: "D"	More than 0.36V	
		Accelerator pedal fully depressed		
111	L	Sensors' power supply	[Ignition switch "ON"]	Approximately 5V

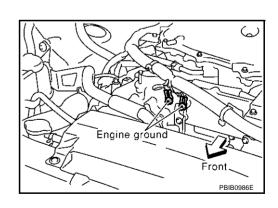
Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

1. Turn ignition switch "OFF".

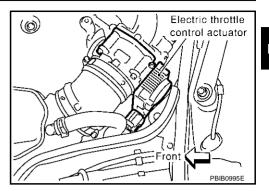
2. Loosen and retighten engine ground screws.

>> GO TO 2.



$\overline{2}$. CHECK THROTTLE POSITION SENSOR 1 POWER SUPPLY CIRCUIT

- 1. Disconnect electric throttle control actuator harness connector.
- 2. Turn ignition switch "ON".

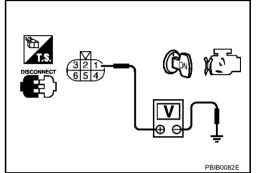


Check voltage between electric throttle control actuator terminal 1 and ground with CONSULT-II or tester.

Voltage: Approximately 5V

OK or NG

OK >> GO TO 4. NG >> GO TO 3.



3. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-4
- Harness for open or short between electric throttle control actuator and ECM
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK THROTTLE POSITION SENSOR 1 GROUND CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch "OFF".
- Check harness continuity between electric throttle control actuator terminal 5 and engine ground. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 6. NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-3
- Harness for open or short between electric throttle control actuator and ECM
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

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6. CHECK THROTTLE POSITION SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Disconnect ECM harness connector.
- 2. Check harness continuity between ECM terminal 83 and electric throttle control actuator terminal 4. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 7.

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

7. CHECK THROTTLE POSITION SENSOR

Refer to EC-302, "Component Inspection".

OK or NG

OK >> GO TO 9. NG >> GO TO 8.

8. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

- 1. Replace the electric throttle control actuator.
- 2. Perform EC-51, "Throttle Valve Closed Position Learning".
- 3. Perform EC-51, "Idle Air Volume Learning".

>> INSPECTION END

9. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

Component Inspection THROTTLE POSITION SENSOR

ABS0008V

- 1. Reconnect all harness connectors disconnected.
- 2. Perform EC-51, "Throttle Valve Closed Position Learning".
- 3. Turn ignition switch "ON".
- 4. Set selector lever to "D" position.
- Check voltage between ECM terminals 83 (TP sensor 1 signal), 84 (TP sensor 2 signal) and engine ground under the following conditions.

Terminal	Accelerator pedal	Voltage
83	Fully released	More than 0.36V
(Throttle position sensor 1)	Fully depressed	Less than 4.75V
84	Fully released	Less than 4.75V
(Throttle position sensor 2)	Fully depressed	More than 0.36V

- ECM OCONNECTOR

 83 84

 PRIBOSERE
- 6. If NG, replace electric throttle control actuator and go to the next step.
- 7. Perform EC-51, "Throttle Valve Closed Position Learning".
- 8. Perform <u>EC-51, "Idle Air Volume Learning"</u>.

DTC P0222, P0223 TP SENSOR

[TYPE 1]

Removal and Installation ELECTRIC THROTTLE CONTROL ACTUATOR

ABS0008W

Refer to EM-18, "INTAKE MANIFOLD COLLECTOR".

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DTC P0226 APP SENSOR

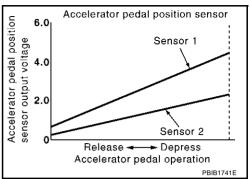
Component Description

PFP:18002

ARSONORX

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 potentiometers 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 feed 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 the engine operation such as fuel cut.

CONSULT-II Reference Value in Data Monitor Mode

ABS00003

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
ACCEL SEN1	Ignition switch: ON	Accelerator pedal: Fully released	0.41 - 0.72V
ACCEL SEIVI	(Engine stopped)	Accelerator pedal: Fully depressed	More than 3.2V
ACCEL SEN2*	Ignition switch: ON	Accelerator pedal: Fully released	0.15 - 0.98V
ACCEL SEN2	(Engine stopped)	Accelerator pedal: Fully depressed	More than 2.98V
CLSD THL POS	Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	ON
CLOD THE POS		Accelerator pedal: Slightly depressed	OFF

^{*:} Accelerator pedal position sensor 2 signal is converted by ECM internally. Thus, it differs from ECM terminal voltage signal.

On Board Diagnosis Logic

ABS0008Z

This self-diagnosis has the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0226 0226	Accelerator pedal position sensor circuit range/performance problem	Rationally incorrect voltage is sent to ECM compared with the signals from APP sensor 1 and APP sensor 2.	 Harness or connector (The APP sensor 1 and 2 circuit is open or shorted.) Accelerator pedal position sensor 1 and 2

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Engine operating condition in fail-safe mode

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.

So, the acceleration will be poor.

DTC P0226 APP SENSOR

[TYPE 1]

DTC Confirmation Procedure

ABS00090

NOTE:

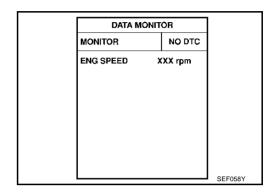
If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

(II) WITH CONSULT-II

- 1. Turn ignition switch "ON".
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- 3. Start engine and let it idle for 1 second.
- 4. If DTC is detected, go to EC-307, "Diagnostic Procedure".



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Follow the procedure "WITH CONSULT-II" above.

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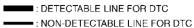
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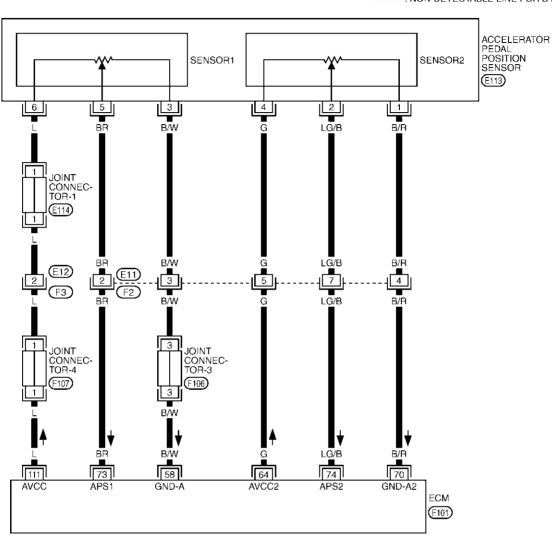
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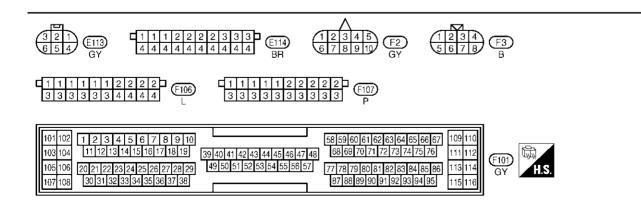
Wiring Diagram

ABS00091

EC-APPS3-01







TBWT0151E

DTC P0226 APP SENSOR

[TYPE 1]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

			· · · · · · · · · · · · · · · · · · ·	<u> </u>
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
58	B/W	Sensors' ground	[Engine is running]Warm-up conditionIdle speed	Approximately 0V
64	G	Accelerator pedal position sensor 2 power supply	[Ignition switch "ON"]	Approximately 2.5V
70	B/R	Accelerator pedal position sensor 2 ground	[Ignition switch "ON"]	Approximately 0V
73	BR	Accelerator pedal position sensor 1	 [Ignition switch "ON"] Engine stopped Accelerator pedal fully released [Ignition switch "ON"] Engine stopped 	0.41 - 0.72V More than 3.2V
	74 LG/B Accelerator pedal position sensor 2	Accelerator pedal position	 Accelerator pedal fully depressed [Ignition switch "ON"] Engine stopped Accelerator pedal fully released 	0.07 - 0.49V
74		[Ignition switch "ON"] • Engine stopped • Accelerator pedal fully depressed	More than 1.49V	
111	L	Sensors' power supply	[Ignition switch "ON"]	Approximately 5V

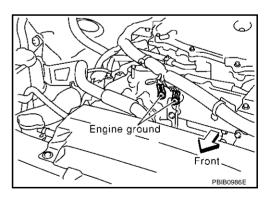
Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

Turn ignition switch "OFF".

Loosen and retighten engine ground screws.

>> GO TO 2.



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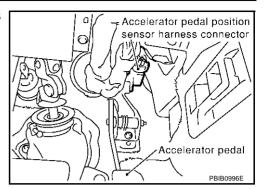
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EC-307 Revision; 2004 April 2003 G35 Sedan

2. CHECK APP SENSOR POWER SUPPLY CIRCUIT

- 1. Disconnect accelerator pedal position (APP) sensor harness connector.
- 2. Turn ignition switch "ON".

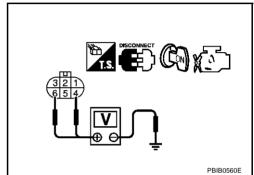


3. Check voltage between APP sensor terminals 4, 6 and ground with CONSULT-II or tester.

APP sensor terminal	Voltage (V)
4	Approximately 2.5
6	Approximately 5

OK or NG

OK >> GO TO 4. NG >> GO TO 3.



3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Harness connectors E11, F2
- Joint connector-4
- Joint connector-1
- Harness for open or short between ECM and accelerator pedal position sensor

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

4. CHECK APP SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch "OFF".
- 2. Check harness continuity between APP sensor terminals 3, 1 and engine ground. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 6.

NG >> GO TO 5.

DTC P0226 APP SENSOR

[TYPE 1]

5. DETECT MALFUNCTIONING PART	Δ
Check the following. • Harness connectors E11, F2 • Joint connector-3	EC
Harness for open or short between ECM and accelerator pedal position sensor	
>> Repair open circuit or short to ground or short to power in harness or connectors.	С
6. CHECK APP SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT	D
 Disconnect ECM harness connector. Check harness continuity between ECM terminal 73 and APP sensor terminal 5, ECM terminal 74 and APP sensor terminal 2. Refer to Wiring Diagram. 	E
Continuity should exist. 3. Also check harness for short to ground and short to power. OK or NG OUT 0.0 TO 0.	F
OK >> GO TO 8. NG >> GO TO 7.	G
7. DETECT MALFUNCTIONING PART	Н
 Check the following. Harness connectors E11, F2 Harness for open or short between ECM and accelerator pedal position sensor 	ı
>> Repair open circuit or short to ground or short to power in harness or connectors. 8. CHECK APP SENSOR	J
Refer to EC-310, "Component Inspection" . OK or NG OK >> GO TO 9. NG >> Replace accelerator pedal assembly.	K
9. CHECK INTERMITTENT INCIDENT	_
Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".	M

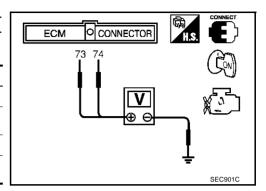
>> INSPECTION END

Component Inspection
ACCELERATOR PEDAL POSITION SENSOR

ABS00093

- 1. Reconnect all harness connectors disconnected.
- 2. Turn ignition switch "ON".
- 3. Check voltage between ECM terminals 73 (APP sensor 1 signal), 74 (APP sensor 2 signal) and engine ground under the following conditions.

Terminal	Accelerator pedal	Voltage
73	Fully released	0.41 - 0.72V
(Accelerator pedal position sensor 1)	Fully depressed	More than 3.2V
74	Fully released	0.07 - 0.49V
(Accelerator pedal position sensor 2)	Fully depressed	More than 1.49V



- 4. If NG, replace accelerator pedal assembly and go to next step.
- 5. Perform EC-51, "Accelerator Pedal Released Position Learning".
- 6. Perform EC-51, "Throttle Valve Closed Position Learning".
- 7. Perform EC-51, "Idle Air Volume Learning".

Removal and Installation ACCELERATOR PEDAL

ABS00094

Refer to ACC-4, "ACCELERATOR CONTROL SYSTEM".

DTC P0227, P0228 APP SENSOR

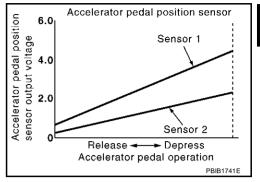
PFP:18002

Component Description

ABS00095

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 potentiometers 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 feed 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 the engine operation such as fuel cut.

CONSULT-II Reference Value in Data Monitor Mode

ABS00002

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
ACCEL SEN1	Ignition switch: ON	Accelerator pedal: Fully released	0.41 - 0.72V
ACCEL SEIVI	(Engine stopped)	Accelerator pedal: Fully depressed	More than 3.2V
ACCEL SEN2*	Ignition switch: ON	Accelerator pedal: Fully released	0.15 - 0.98V
ACCEL SLIVE	(Engine stopped)	Accelerator pedal: Fully depressed	More than 2.98V
CLSD THL POS • Ignition switch: ON	Ignition switch: ON	Accelerator pedal: Fully released	ON
(Engine stopped)		Accelerator pedal: Slightly depressed	OFF

^{*:} Accelerator pedal position sensor 2 signal is converted by ECM internally. Thus, it differs from ECM terminal voltage signal.

On Board Diagnosis Logic

ABS00097

These self-diagnoses have the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0227 0227	Accelerator pedal position sensor 1 circuit low input	An excessively low voltage from the APP sensor 1 is sent to ECM.	Harness or connectors (The APP sensor 1 circuit is open or shorted.)
P0228 0228	Accelerator pedal position sensor 1 circuit high input	An excessively high voltage from the APP sensor 1 is sent to ECM.	,

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Engine operating condition in fail-safe mode

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.

So, the acceleration will be poor.

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DTC Confirmation Procedure

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NOTE:

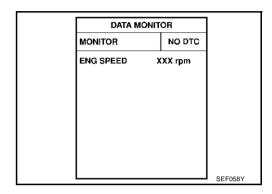
If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

(II) WITH CONSULT-II

- 1. Turn ignition switch "ON".
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- 3. Start engine and let it idle for 1 second.
- 4. If DTC is detected, go to EC-314, "Diagnostic Procedure".



WITH GST

Follow the procedure "WITH CONSULT-II" above.

Wiring Diagram

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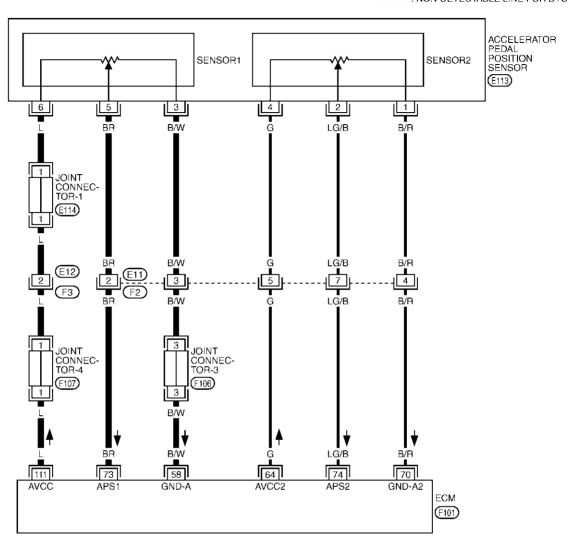
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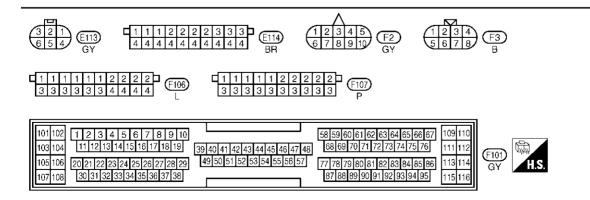
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EC-APPS1-01







TBWT0152E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
58	B/W	Sensors' ground	[Engine is running]Warm-up conditionIdle speed	Approximately 0V
64	G	Accelerator pedal position sensor 2 power supply	[Ignition switch "ON"]	Approximately 2.5V
70	B/R	Accelerator pedal position sensor 2 ground	[Ignition switch "ON"]	Approximately 0V
73	BR	Accelerator pedal position sensor 1	[Ignition switch "ON"] • Engine stopped • Accelerator pedal fully released [Ignition switch "ON"] • Engine stopped • Accelerator pedal fully depressed	0.41 - 0.72V More than 3.2V
74	LG/B	Accelerator pedal position sensor 2	[Ignition switch "ON"] • Engine stopped • Accelerator pedal fully released [Ignition switch "ON"] • Engine stopped • Accelerator pedal fully depressed	0.07 - 0.49V More than 1.49V
111	L	Sensors' power supply	[Ignition switch "ON"]	Approximately 5V

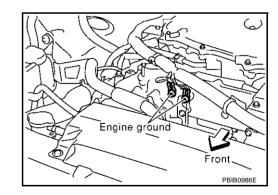
Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

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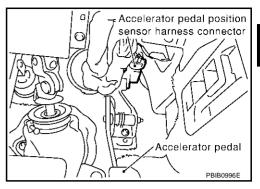
- 1. Turn ignition switch "OFF".
- 2. Loosen and retighten engine ground screws.

>> GO TO 2.



2. CHECK APP SENSOR 1 POWER SUPPLY CIRCUIT

- Disconnect accelerator pedal position (APP) sensor harness connector.
- Turn ignition switch "ON".

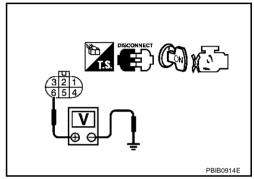


Check voltage between APP sensor terminal 6 and ground with CONSULT-II or tester.

Voltage: Approximately 5V

OK or NG

OK >> GO TO 4. NG >> GO TO 3.



3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Joint connector-4
- Joint connector-1
- Harness for open or short between ECM and accelerator pedal position sensor
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK APP SENSOR 1 GROUND CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch "OFF".
- Check harness continuity between APP sensor terminal 3 and engine ground. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

>> GO TO 6. OK >> GO TO 5. NG

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E11, F2
- Joint connector-3
- Harness for open or short between ECM and accelerator pedal position sensor

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

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6. CHECK APP SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Disconnect ECM harness connector.
- 2. Check harness continuity between ECM terminal 73 and APP sensor terminal 5. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 8. NG >> GO TO 7.

7. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E11, F2
- Harness for open or short between ECM and accelerator pedal position sensor
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

8. CHECK APP SENSOR

Refer to EC-316, "Component Inspection".

OK or NG

OK >> GO TO 9.

NG >> Replace accelerator pedal assembly.

9. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

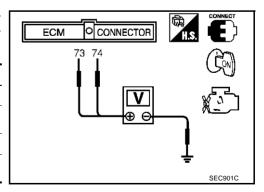
>> INSPECTION END

Component Inspection ACCELERATOR PEDAL POSITION SENSOR

ABS0009B

- 1. Reconnect all harness connectors disconnected.
- 2. Turn ignition switch "ON".
- Check voltage between ECM terminals 73 (APP sensor 1 signal), 74 (APP sensor 2 signal) and engine ground under the following conditions.

Terminal	Accelerator pedal	Voltage
73	Fully released	0.41 - 0.72V
(Accelerator pedal position sensor 1)	Fully depressed	More than 3.2V
74	Fully released	0.07 - 0.49V
(Accelerator pedal position sensor 2)	Fully depressed	More than 1.49V



- 4. If NG, replace accelerator pedal assembly.
- 5. Perform EC-51, "Accelerator Pedal Released Position Learning".
- 6. Perform EC-51, "Throttle Valve Closed Position Learning".
- Perform <u>EC-51</u>, "Idle Air Volume Learning".

Removal and Installation ACCELERATOR PEDAL

ABS0009C

Refer to ACC-4, "ACCELERATOR CONTROL SYSTEM".

DTC P0300 - P0306 MULTIPLE CYLINDER MISFIRE, NO. 1 - 6 CYLINDER MIS-

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DTC P0300 - P0306 MULTIPLE CYLINDER MISFIRE, NO. 1 - 6 CYLINDER MIS-**FIRF**

On Board Diagnosis Logic

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When a misfire occurs, engine speed will fluctuate. If the engine speed fluctuates enough to cause the crankshaft position (CKP) sensor (POS) signal to vary, ECM can determine that a misfire is occurring.

Sensor	Input Signal to ECM	ECM function
Crankshaft position sensor (POS)	Engine speed	On board diagnosis of misfire

The misfire detection logic consists of the following two conditions.

One Trip Detection Logic (Three Way Catalyst Damage)

On the first 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.

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 on any one cylinder or on multiple cylinders.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0300 0300	Multiple cylinder misfire detected	Multiple cylinder misfire.	Improper spark plug
P0301 0301	No.1 cylinder misfire detected	No. 1 cylinder misfires.	Insufficient compression Incorrect fuel pressure
P0302 0302	No. 2 cylinder misfire detected	No. 2 cylinder misfires.	The injector circuit is open or shorted Fuel injectors
P0303 0303	No. 3 cylinder misfire detected	No. 3 cylinder misfires.	Intake air leak The ignition signal circuit is open or
P0304 0304	No. 4 cylinder misfire detected	No. 4 cylinder misfires.	shorted • Lack of fuel
P0305 0305	No. 5 cylinder misfire detected	No. 5 cylinder misfires.	Signal plate Heated oxygen sensor 1
P0306 0306	No. 6 cylinder misfire detected	No. 6 cylinder misfires.	Incorrect PCV hose connection

DTC Confirmation Procedure

ABS0009E

CAUTION:

Always drive vehicle at a safe speed.

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

EC-317 Revision; 2004 April 2003 G35 Sedan

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DTC P0300 - P0306 MULTIPLE CYLINDER MISFIRE, NO. 1 - 6 CYLINDER MISFIRE

[TYPE 1]

PBIB0164E

DATA MONITOR

VHCL SPEED SE XXX km/h

B/FUEL SCHDL XXX msec

NO DTC

XXX rpm

XXX °C

MONITOR

ENG SPEED

COOLAN TEMP/S

(P) WITH CONSULT-II

- Turn ignition switch ON, and select "DATA MONITOR" mode with CONSULT-II.
- 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 about 15 minutes.
- 5. If 1st trip DTC is detected, go to EC-318, "Diagnostic Procedure"

NOTE:

If 1st trip DTC is not detected during above procedure, performing the following procedure is advised.

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Start engine and drive the vehicle under the 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.

The similar conditions to (1st trip) Freeze Frame Data means the vehicle operation that the following conditions should be satisfied at the same time.

Engine speed	Engine speed in the freeze frame data $\pm400~\text{rpm}$	
Vehicle speed in the freeze frame data \pm 10 km/h (5 MPH)		
Engine coolant temperature	When the freeze frame data shows lower than 70 °C (158 °F), T should be lower than 70 °C (158 °F).	
(T) 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).	

The time to driving 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

WITH GST

Follow the procedure "WITH CONSULT-II" above.

Diagnostic Procedure

1. CHECK FOR INTAKE AIR LEAK AND PCV HOSE

1. Start engine and run it at idle speed.

- 2. Listen for the sound of the intake air leak.
- 3. Check PCV hose connection.

OK or NG

OK >> GO TO 2.

NG >> Discover air leak location and repair.

2. CHECK FOR EXHAUST SYSTEM CLOGGING

Stop engine and visually check exhaust tube, three way catalyst and muffler for dents.

OK or NG

OK >> GO TO 3.

NG >> Repair or replace it.

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Revision; 2004 April EC-318 2003 G35 Sedan

DTC P0300 - P0306 MULTIPLE CYLINDER MISFIRE, NO. 1 - 6 CYLINDER MISFIRE

[TYPE 1]

3. PERFORM POWER BALANCE TEST

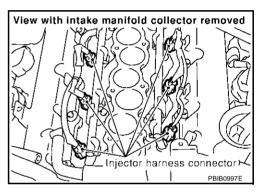
(II) With CONSULT-II

- 1. Perform "POWER BALANCE" in "ACTIVE TEST" mode.
- 2. Is there any cylinder which does not produce a momentary engine speed drop?

		1
ACTIVE TEST		
POWER BALANCE		
MONITOR		
ENG SPEED	XXX rpm	
MAS A/F SE-B1	XXX V	
		PBIB0133E

W Without CONSULT-II

When disconnecting each injector harness connector one at a time, is there any cylinder which does not produce a momentary engine speed drop?



Yes or No

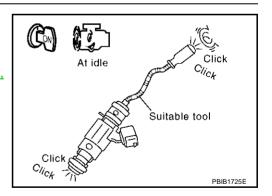
Yes >> GO TO 4. No >> GO TO 7.

4. CHECK INJECTOR

Does each injector make an operating sound at idle? Yes or No

Yes >> GO TO 5.

No >> Check injector(s) and circuit(s). Refer to <u>EC-601</u>, "INJECTOR CIRCUIT".



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5. CHECK IGNITION SPARK

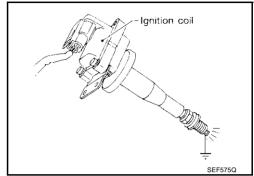
- 1. Remove ignition coil assembly from rocker cover.
- 2. Remove spark plug from ignition coil assembly
- 3. Connect a known good spark plug to the ignition coil.
- 4. Place end of spark plug against a suitable ground and crank engine.
- 5. Check for spark.

OK or NG

OK >> GO TO 6.

NG

>> Check ignition coil, power transistor and their circuits. Refer to EC-589, "IGNITION SIGNAL".



6. CHECK SPARK PLUGS

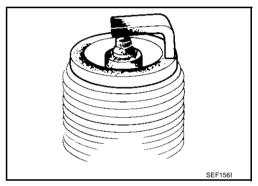
Remove the spark plugs and check for fouling, etc.

OK or NG

OK >> GO TO 7.

NG

>> Repair or replace spark plug(s) with standard type one(s). For spark plug type, refer to, MA-13, "ENGINE MAINTENANCE".



7. CHECK COMPRESSION PRESSURE

Check compression pressure. Refer to EM-87, "CHECKING COMPRESSION PRESSURE".

 Standard:
 1,275 kPa (13.0 kg/cm², 185 psi)/300 rpm

 Minimum:
 981 kPa (10.0 kg/cm², 142 psi)/300 rpm

 Difference between each
 98 kPa (1.0 kg/cm², 14 psi)/300 rpm

cylinder:

OK or NG

OK >> GO TO 8.

NG >> Check pistons, piston rings, valves, valve seats and cylinder head gaskets.

8. CHECK FUEL PRESSURE

- 1. Install all removed parts.
- 2. Release fuel pressure to zero. Refer to EC-53, "FUEL PRESSURE RELEASE".
- 3. Install fuel pressure gauge and check fuel pressure. Refer to EC-55, "FUEL PRESSURE CHECK".

At idle: Approx. 350 kPa (3.57 kg/cm², 51 psi)

OK or NG

OK >> GO TO 10. NG >> GO TO 9.

DTC P0300 - P0306 MULTIPLE CYLINDER MISFIRE, NO. 1 - 6 CYLINDER MIS-

[TYPE 1]

9. DETECT MALFUNCTIONING PART

Check the following.

- Fuel pump and circuit (Refer to EC-611, "FUEL PUMP CIRCUIT".)
- Fuel pressure regulator (Refer to EC-55, "FUEL PRESSURE CHECK".)
- **Fuel lines**
- Fuel filter for clogging

>> Repair or replace.

10. CHECK IGNITION TIMING

Check the following items. Refer to EC-86, "Basic Inspection".

Items	Specifications
Target idle speed	650 ± 50 rpm (in "P" or "N" position)
Ignition timing	15 ± 5° BTDC (in "P" or "N" position)

OK or NG

OK >> GO TO 11.

NG >> Follow the EC-86, "Basic Inspection".

11. CHECK HEATED OXYGEN SENSOR 1 (BANK 1)/(BANK 2)

Refer to EC-219, "Component Inspection".

OK or NG

OK >> GO TO 13. NG >> GO TO 12.

12. CHECK MASS AIR FLOW SENSOR

(P) With CONSULT-II

Check mass air flow sensor signal in "DATA MONITOR" mode with CONSULT-II.

2.0 - 6.0 g·m/sec: at idling 7.0 - 20.0 g·m/sec: at 2,500 rpm

6 With GST

Check mass air flow sensor signal in MODE 1 with GST.

2.0 - 6.0 g·m/sec: at idling 7.0 - 20.0 q·m/sec: at 2,500 rpm

OK or NG

OK >> GO TO 13.

NG >> Check connectors for rusted terminals or loose connections in the mass air flow sensor circuit or engine grounds. Refer to EC-170, "DTC P0101 MAF SENSOR".

13. CHECK SYMPTOM MATRIX CHART

Check items on the rough idle symptom in EC-91, "Symptom Matrix Chart".

OK or NG

OK >> GO TO 14.

NG >> Repair or replace.

EC-321 Revision; 2004 April 2003 G35 Sedan

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DTC P0300 - P0306 MULTIPLE CYLINDER MISFIRE, NO. 1 - 6 CYLINDER MISFIRE

[TYPE 1]

14. 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 <u>EC-69</u>, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION".

>> GO TO 15.

15. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

DTC P0327, P0328 KS

PFP:22060

Component Description

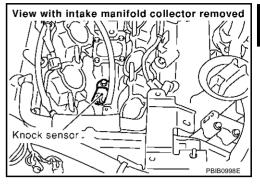
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The knock sensor is attached to the cylinder block. It senses engine knocking using a piezoelectric element. A knocking vibration from the cylinder block is sensed as vibrational pressure. This pressure is converted into a voltage signal and sent to the ECM.



On Board Diagnosis Logic

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The MIL will not light up for these diagnoses.

DTC No.	Trouble diagnosis name	DTC detected condition	Possible cause
P0327 0327	Knock 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.)
P0328 0328	Knock sensor circuit high input	An excessively high voltage from the sensor is sent to ECM.	Knock sensor

DTC Confirmation Procedure

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NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

(A) WITH CONSULT-II

- 1. Turn ignition switch "ON" and select "DATA MONITOR" mode with CONSULT-II.
- 2. Start engine and run it for at least 5 seconds at idle speed.
- 3. If 1st trip DTC is detected, go to EC-325, "Diagnostic Procedure"

DATA M	DATA MONITOR	
MONITOR	NO DTC	
ENG SPEED	XXX rpm	

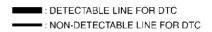
WITH GST

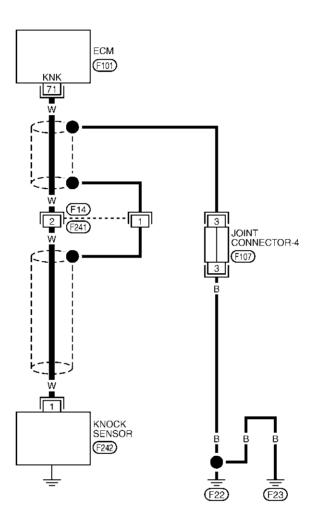
Follow the procedure "WITH CONSULT-II" above.

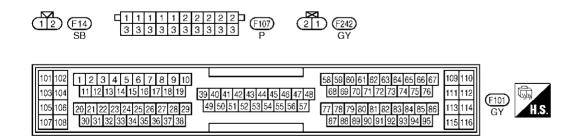
Wiring Diagram

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EC-KS-01







TBWT0323E

[TYPE 1]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
71	W	Knock sensor	[Engine is running] ● Idle speed	Approximately 2.5V

Diagnostic Procedure

ABS0009K

${f 1}$. CHECK KNOCK SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT-I

- Turn ignition switch "OFF". 1.
- Disconnect ECM harness connector.
- 3 Check resistance between ECM terminal 71 and engine ground. Refer to Wiring Diagram.

It is necessary to use an ohmmeter which can measure more than 10 M Ω .

Resistance: Approximately 530 - 590 k Ω [at 20°C (68°F)]

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

OK or NG

OK >> GO TO 4. NG >> GO TO 2.

$2\cdot$ CHECK KNOCK SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT-II

- Disconnect knock sensor harness connector.
- Check harness continuity between ECM terminal 71 and knock sensor terminal 1. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 4. NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F14, F241
- Harness for open or short between ECM and knock sensor
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK KNOCK SENSOR

Refer to EC-326, "Component Inspection".

OK or NG

OK >> GO TO 5.

NG >> Replace knock sensor. View with intake manifold collector removed Knock sensor

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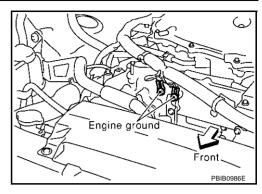
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5. RETIGHTEN GROUND SCREWS

Loosen and retighten engine ground screws.

>> GO TO 6.



6. CHECK KNOCK SENSOR SHIELD CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch "OFF".
- 2. Disconnect harness connectors F14, F241.
- Check harness continuity between harness connector F14 terminal 1 and engine ground. Refer to Wiring Diagram.

OK or NG

OK >> GO TO 8. >> GO TO 7. NG

7. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-4
- Harness for open or short between harness connector F14 terminal 1 and engine ground
 - >> Repair open circuit or short power in harness or connectors.

8. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

Component Inspection KNOCK SENSOR

Check resistance between knock sensor terminal 1 and ground.

It is necessary to use an ohmmeter which can measure more than 10 M Ω .

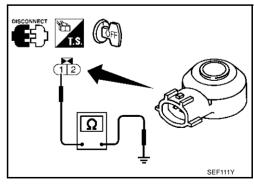
Resistance: Approximately 530 - 590 k Ω [at 20°C (68°F)]

CAUTION:

Do not use any knock sensors that have been dropped or physically damaged. Use only new ones.

Removal and Installation **KNOCK SENSOR**

Refer to EM-103, "CYLINDER BLOCK".



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EC-326 2003 G35 Sedan Revision; 2004 April

ABS0009M

[TYPE 1]

DTC P0335 CKP SENSOR (POS)

PFP:23731

Component Description

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The crankshaft position sensor (POS) is located on the oil pan facing the gear teeth (cogs) of the signal plate. It detects the fluctuation of the engine revolution.

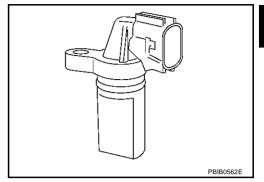
The sensor consists of a permanent magnet and Hall IC.

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.



CONSULT-II Reference Value in Data Monitor Mode

ABS00090

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
ENG SPEED-	 Tachometer: Connect Run engine and compare tachometer indication with the CONSULT-II value. 	Almost the same speed as the CONSULT-II value.

On Board Diagnosis Logic

ABS0009P

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0335 0335	Crankshaft position sensor (POS) circuit	 The crankshaft position sensor (POS) signal is not detected by the ECM during the first few seconds of engine cranking. The proper pulse signal from the crankshaft position sensor (POS) is not sent to ECM while the engine is running. The crankshaft position sensor (POS) signal is not in the normal pattern during engine running. 	 Harness or connectors (The sensor circuit is open or shorted) Crankshaft position sensor (POS) Signal plate

DTC Confirmation Procedure

ABS0009Q

NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10.5V with ignition switch "ON".

(P) WITH CONSULT-II

- 1. Turn ignition switch "ON" and select "DATA MONITOR" mode with CONSULT-II.
- Crank engine for at least 2 seconds and run it for at least 5 seconds at idle speed.
- If 1st trip DTC is detected, go to <u>EC-330</u>, "<u>Diagnostic Procedure</u>"

If 1st trip DTC is not detected, go to next step.

- Maintaining engine speed at more than 800 rpm for at least 5 seconds.
- 5. If 1st trip DTC is detected, go to EC-330, "Diagnostic Procedure"

DATA M	ONITOR	
MONITOR	NO DTC	
ENG SPEED	XXX rpm	
		J SEF058Y

Revision; 2004 April EC-327 2003 G35 Sedan

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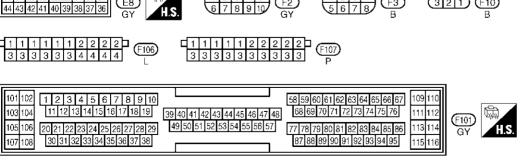
DTC P0335 CKP SENSOR (POS)

[TYPE 1]

WITH GST

Follow the procedure "WITH CONSULT-II" above.

[TYPE 1] **Wiring Diagram** Α EC-POS-01 BATTERY ■: DETECTABLE LINE FOR DTC : NON-DETECTABLE LINE FOR DTC EC IPDM E/R 82 (INTELLIGENT POWER DISTRIBUTION REFER TO PG-POWER. С MODULE ENGINE ROOM) ECM (E8) RELAY D 33 | Е CRANKSHAFT POSITION SENSOR (POS) (F2) (F3) G (F10) Н JOINT CONNECTOR-3 JOINT CONNECTOR-4 (F106) (F107) W/B BR 38 112 95 110 ECM (F101) M (F106)



TBWT0155E

Specification data are reference values and are measured between each terminal and ground. Pulse signal is measured by CONSULT-II.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
95	BR	Crankshaft position sensor	[Engine is running]Warm-up conditionIdle speed	Approximately 1.6V★ 20 5.0 V/Div 1 me/Div T PBIB1041E
90	БК	(POS)	[Engine is running] ● Engine speed is 2,000 rpm.	Approximately 1.5V★ → 5.0 V/Div 1 me/Div T PBIB1042E

^{★:} Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

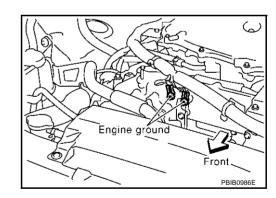
Diagnostic Procedure

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1. RETIGHTEN GROUND SCREWS

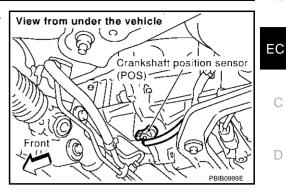
- 1. Turn ignition switch "OFF".
- 2. Loosen and retighten engine ground screws.

>> GO TO 2.



$2.\,$ check crankshaft position (ckp) sensor (pos) power supply circuit

- Disconnect crankshaft position (CKP) sensor (POS) harness connector.
- Turn ignition switch "ON".

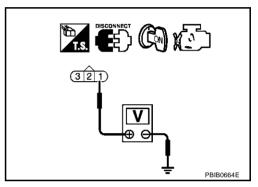


Check voltage between CKP sensor (POS) terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 4. NG >> GO TO 3.



3. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-3
- Harness connectors E12, F3
- Harness for open or short between crankshaft position sensor (POS) and ECM
- Harness for open or short between crankshaft position sensor (POS) and IPDM E/R

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

4. CHECK CKP SENSOR (POS) GROUND CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch "OFF".
- Check harness continuity between CKP sensor (POS) terminal 3 and engine ground. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 5.

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

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5. CHECK CKP SENSOR (POS) INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Disconnect ECM harness connector.
- 2. Check harness continuity between ECM terminal 95 and CKP sensor (POS) terminal 2. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 6.

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

6. CHECK CRANKSHAFT POSITION SENSOR (POS)

Refer to EC-332, "Component Inspection".

OK or NG

OK >> GO TO 7.

NG >> Replace crankshaft position sensor (POS).

7. CHECK GEAR TOOTH

Visually check for chipping signal plate gear tooth.

OK or NG

OK >> GO TO 8.

NG >> Replace the signal plate.

8. CHECK INTERMITTENT INCIDENT

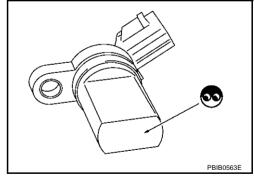
Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

Component Inspection CRANKSHAFT POSITION SENSOR (POS)

1. Loosen the fixing bolt of the sensor.

- 2. Disconnect crankshaft position sensor (POS) harness connector.
- 3. Remove the sensor.
- 4. Visually check the sensor for chipping.



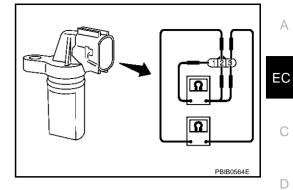
Revision; 2004 April EC-332 2003 G35 Sedan

DTC P0335 CKP SENSOR (POS)

[TYPE 1]

5. Check resistance as shown in the figure.

Terminal No. (Polarity)	Resistance Ω [at 25°C (77°F)]
1 (+) - 2 (-)	
1 (+) - 3 (-)	Except 0 or ∞
2 (+) - 3 (-)	



Removal and Installation CRANKSHAFT POSITION SENSOR (POS)

Refer to EM-28, "OIL PAN AND OIL STRAINER" .

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PFP:23731

DTC P0340, P0345 CMP SENSOR (PHASE)

Component Description

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The camshaft position sensor (PHASE) senses the retraction of intake valve camshaft to identify a particular cylinder. The camshaft position sensor (PHASE) senses the piston position.

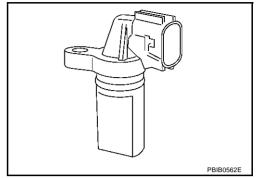
When the crankshaft position sensor (POS) system becomes inoperative, the camshaft position sensor (PHASE) provides various controls of engine parts instead, utilizing timing of cylinder identification signals.

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.



CONSULT-II Reference Value in Data Monitor Mode

ABS00951

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
ENG SPEED.	 Tachometer: Connect Run engine and compare tachometer indication with the CONSULT-II value. 	Almost the same speed as the CONSULT-II value.

On Board Diagnosis Logic

ABS00000

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0340 0340		The cylinder No. signal is not sent to ECM for the first few seconds during engine	Harness or connectors (The sensor circuit is open or shorted)
(Bank 1)		cranking.	 Camshaft position sensor (PHASE)
	Camshaft position sen- sor (PHASE) circuit	 The cylinder No. signal is not sent to ECM during engine running. The cylinder No. signal is not in the normal 	Camshaft (Intake)
P0345 0345	SOI (FHASE) CITCUIT		• Starter motor (Refer to SC-9.)
(Bank 2)			• Starting system circuit (Refer to SC-9.)
		pattern during engine running.	Dead (Weak) battery

DTC Confirmation Procedure

ABS0009X

NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10.5V with ignition switch "ON".

(P) WITH CONSULT-II

- 1. Turn ignition switch "ON".
- Select "DATA MONITOR" mode with CONSULT-II.
- Crank engine for at least 2 seconds and run it for at least 5 seconds at idle speed.
- 4. If 1st trip DTC is detected, go to <u>EC-339</u>, "Diagnostic Procedure"

If 1st trip DTC is not detected, go to next step.

- Maintaining engine speed at more than 800 rpm for at least 5 seconds.
- If 1st trip DTC is detected, go to <u>EC-339</u>, "<u>Diagnostic Procedure</u>"

DATA M	ONITOR
MONITOR	NO DTC
ENG SPEED	XXX rpm

Revision; 2004 April EC-334 2003 G35 Sedan

DTC P0340, P0345 CMP SENSOR (PHASE)

[TYPE 1]

WITH GST

Follow the procedure "WITH CONSULT-II" above.

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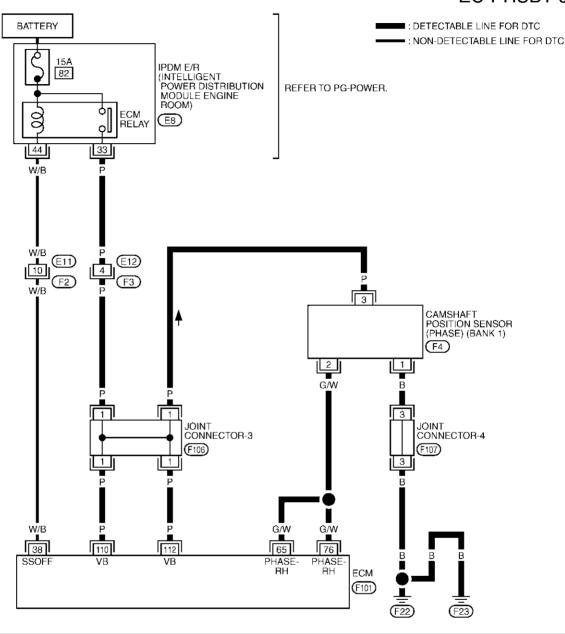
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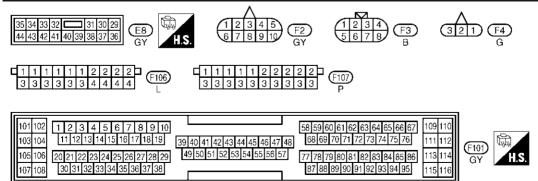
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Wiring Diagram BANK 1

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EC-PHSB1-01





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DTC P0340, P0345 CMP SENSOR (PHASE)

[TYPE 1]

Specification data are reference values and are measured between each terminal and ground. Pulse signal is measured by CONSULT-II.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
65	G/W	Camshaft position sensor (PHASE) (bank 1)	[Engine is running]Warm-up conditionIdle speed	1.0 - 4.0V★
76	G/W		[Engine is running] ● Engine speed is 2,000 rpm.	1.0 - 4.0V★ 3.0 V/Div 20 ms/Div PBIB1040E

^{★:} Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

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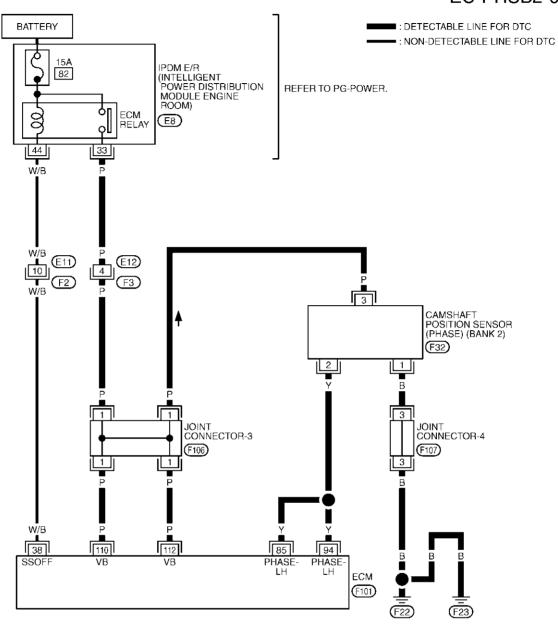
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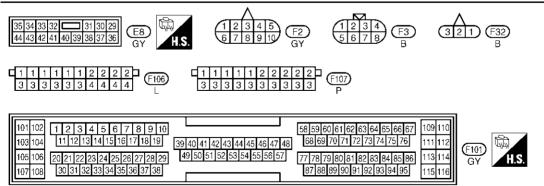
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BANK 2

EC-PHSB2-01





TBWT0157E

DTC P0340, P0345 CMP SENSOR (PHASE)

[TYPE 1]

Specification data are reference values and are measured between each terminal and ground. Pulse signal is measured by CONSULT-II.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
85	Y	Camshaft position sensor (PHASE) (bank 2)	[Engine is running]Warm-up conditionIdle speed	1.0 - 4.0V★ >> 5.0 V/Div 20 ma/Div T PBIB1039E
94	Y		[Engine is running] ● Engine speed is 2,000 rpm.	1.0 - 4.0V★ >> 5.0V/Div 20 ms/Div PBIB1040E

^{★:} Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

1. CHECK STARTING SYSTEM

Turn ignition switch to "START" position.

Does the engine turn over?

Does the starter motor operate?

Yes or No

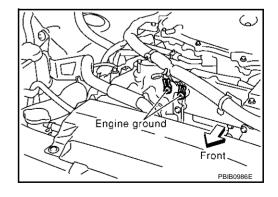
Yes >> GO TO 2.

No >> Check starting system. (Refer to <u>SC-9, "STARTING SYSTEM"</u>.)

2. RETIGHTEN GROUND SCREWS

- 1. Turn ignition switch "OFF".
- 2. Loosen and retighten engine ground screws.

>> GO TO 3.



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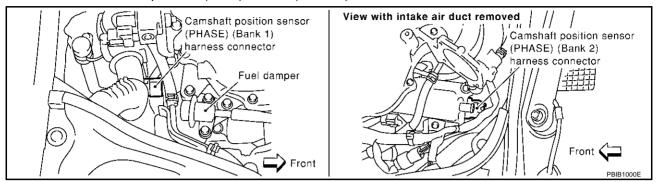
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3. CHECK CAMSHAFT POSITION (CMP) SENSOR (PHASE) POWER SUPPLY CIRCUIT

1. Disconnect camshaft position (CMP) sensor (PHASE) harness connector.

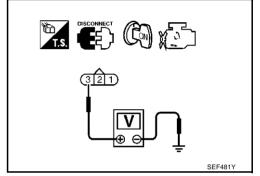


- 2. Turn ignition switch "ON".
- 3. Check voltage between CMP sensor (PHASE) terminal 3 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 5. NG >> GO TO 4.



4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Harness for open or short between camshaft position sensor (PHASE) and ECM
- Harness for open or short between camshaft position sensor (PHASE) and IPDM E/R
- Joint connector-3
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK CMP SENSOR (PHASE) GROUND CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch "OFF".
- 2. Check harness continuity between CMP sensor (PHASE) terminal 1 and engine ground.

Continuity should exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 7. NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-4
- Harness for open or short between CMP sensor (PHASE) and engine ground
 - >> Repair open circuit or short to power in harness or connectors.

[TYPE 1]

$7.\,$ CHECK CMP SENSOR (PHASE) INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Disconnect ECM harness connector.
- Check harness continuity between ECM terminals 65, 76 or 85,94 and CMP sensor (PHASE) terminal 2. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to ground or short to power.

OK or NG

OK >> GO TO 8.

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

8. CHECK CAMSHAFT POSITION SENSOR (PHASE)

Refer to EC-341, "Component Inspection".

OK or NG

OK >> GO TO 9.

NG >> Replace camshaft position sensor (PHASE).

9. CHECK CAMSHAFT (INTAKE)

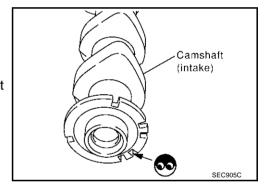
Check the following.

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

OK or NG

OK >> GO TO 10.

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



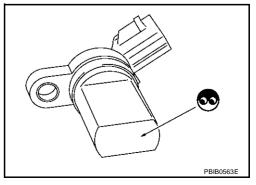
10. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

Component Inspection **CAMSHAFT POSITION SENSOR (PHASE)**

- 1. Loosen the fixing bolt of the sensor.
- 2. Disconnect camshaft position sensor (PHASE) harness connector.
- 3. Remove the sensor.
- Visually check the sensor for chipping.



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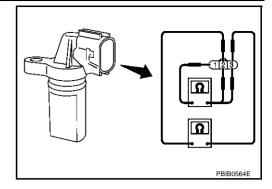
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DTC P0340, P0345 CMP SENSOR (PHASE)

[TYPE 1]

5. Check resistance as shown in the figure.

Terminal No. (Polarity)	Resistance Ω [at 25°C (77°F)]
1 (+) - 2 (-)	
1 (+) - 3 (-)	Except 0 or ∞
2 (+) - 3 (-)	



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Removal and Installation CAMSHAFT POSITION SENSOR (PHASE)

Refer to EM-71, "CAMSHAFT".

DTC P0420, P0430 THREE WAY CATALYST FUNCTION

[TYPE 1]

DTC P0420, P0430 THREE WAY CATALYST FUNCTION

PFP:20905

On Board Diagnosis Logic

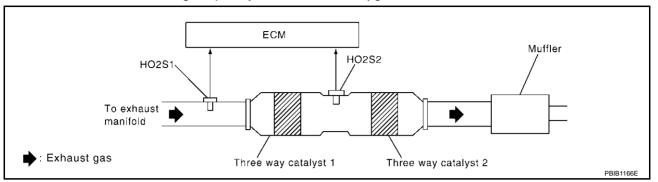
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The ECM monitors the switching frequency ratio of heated oxygen sensors 1 and 2.



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

When the frequency ratio of heated oxygen sensors 1 and 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			Three way catalyst 1	Ы
0420 (Dank 4)			Exhaust tube	11
(Bank 1)		Three way catalyst 1 does not operate prop-	Intake air leaks	
D0 400	Catalyst system effi- ciency below threshold	erly.	Fuel injectors	1
P0430 0430	ciency below timeshold	 Three way catalyst 1 does not have enough oxygen storage capacity. 	Fuel injector leaks	
(Bank 2)		oxygen clorage capacity.	Spark plug	
			• Improper ignition timing	J

DTC Confirmation Procedure

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NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

(P) WITH CONSULT-II

TESTING CONDITION:

Do not hold engine speed for more than the specified minutes below.

- Turn ignition switch "ON" and select "DATA MONITOR" mode with CONSULT-II.
- 2. Start engine and warm it up to the normal operating tempera-
- 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 minutes.
- Make sure that "COOLAN TEMP/S" indicates more than 70°C

If not, warm up engine and go to next step when "COOLAN" TEMP/S" indication reaches to 70°C (158°F).

7. Open engine hood.

DATA MOI	NITOF	3	
MONITOR		NO DTC	
ENG SPEED	XX	K rpm	
COOLAN TEMP/S		x.c	
VHCL SPEED SE			
B/FUEL SCHDL	XXX	msec	
			SEF189Y

DTC P0420. P0430 THREE WAY CATALYST FUNCTION

[TYPE 1]

- Select "DTC & SRT CONFIRMATION" then "SRT WORK SUP-PORT" mode with CONSULT-II.
- 9. Rev engine up to 2,000 to 3,000 rpm and hold it for 3 consecutive minutes then release the accelerator pedal completely. If "INCMP" of "CATALYST" changed to "CMPLT", go to step 12.
- 10. Wait 5 seconds at idle.

SRT WORK SL	IPPORT	
CATALYST	INCMP	
EVAP SYSTEM	INCMP	
HO2S HTR	CMPLT	
HO2S	INCMP	
MONITO	R	-
ENG SPEED	XXX rpm	1
MAS A/F SE-B1	XXX V	
B/FUEL SCHDL	XXX msec	
A/F ALPHA-B1	XXX V	
COOLAN TEMP/S	XX °C	
HO2S1 (B1)	XXX V	

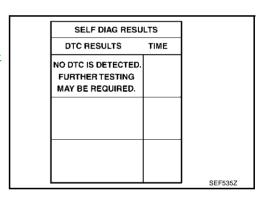
11. Rev engine up to 2,000 to 3,000 rpm and maintain it until "INCMP" of "CATALYST" changes to "CMPLT" (It will take approximately 5 minutes).

If not "CMPLT", stop engine and cool it down to less than 70°C (158°F) and then retest from step 1.

ADT WORK OF	IDDODT
SRT WORK SU	PPORI
CATALYST	CMPLT
EVAP SYSTEM	INCMP
HO2S HTR	CMPLT
HO2S	INCMP
MONITO	R
ENG SPEED	XXX rpm
MAS A/F SE-B1	XXX V
B/FUEL SCHDL	XXX msec
A/F ALPHA-B1	XXX V
COOLAN TEMP/S	XX °C
HO2S1 (B1)	XXX V

- 12. Select "SELF-DIAG RESULTS" mode with CONSULT-II.
- 13. Confirm that the 1st trip DTC is not detected.

 If the 1st trip DTC is detected, go to EC-345, "Diagnostic Procedure".



Overall Function Check

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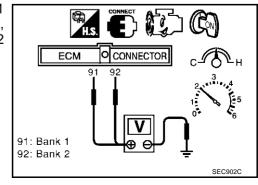
Use this procedure to check the overall function of the three way catalyst 1. During this check, a DTC might not be confirmed.

CAUTION:

Always drive vehicle at a safe speed.

WITH GST

- 1. Turn ignition switch "OFF" and wait at least 10 seconds.
- 2. 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 minutes.
- 4. Open engine hood.
- 5. Set voltmeters probes between ECM terminals 91 [HO2S1 (bank 1) signal], 92 [HO2S1 (bank 2) signal] and engine ground, and ECM terminals 88 [HO2S2 (bank 1) signal], 90 [HO2S2 (bank 2) signal] and engine ground.
- 6. Keep engine speed at 2,000 rpm constant under no load.



DTC P0420, P0430 THREE WAY CATALYST FUNCTION

[TYPE 1]

 Make sure that the voltage switching frequency (high & low) between ECM terminals 88 and engine ground, or 90 and engine ground is very less than that of ECM terminals 91 and engine ground, or 92 and engine ground.

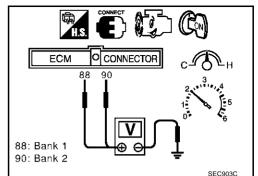
Switching frequency ratio = A/B

A: Heated oxygen sensor 2 voltage switching frequency

B: Heated oxygen sensor 1 voltage switching frequency

This ratio should be less than 0.75.

If the ratio is greater than above, it means three way catalyst does not operate properly. Go to $\underline{\text{EC-345}}$, "Diagnostic Procedure".



NOTE:

If the voltage at terminal 91 or 92 does not switch periodically more than 5 times within 10 seconds at step 7, perform trouble diagnosis for "DTC P0133, P0153" first. (See EC-221.)

Diagnostic Procedure

1. CHECK EXHAUST SYSTEM

Visually check exhaust tubes and muffler for dent.

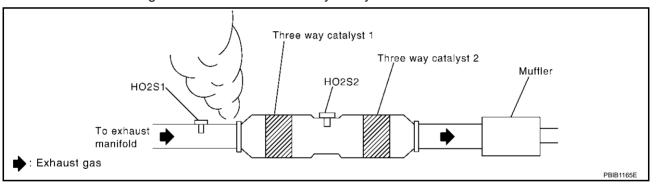
OK or NG

OK >> GO TO 2.

NG >> Repair or replace.

2. CHECK EXHAUST GAS LEAK

- 1. Start engine and run it at idle.
- 2. Listen for an exhaust gas leak before the three way catalyst 1.



OK or NG

OK >> GO TO 3.

NG >> Repair or replace.

3. CHECK INTAKE AIR LEAK

Listen for an intake air leak after the mass air flow sensor.

OK or NG

OK >> GO TO 4.

NG >> Repair or replace.

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4. CHECK IGNITION TIMING

Check the following items. Refer to EC-86, "Basic Inspection".

Items	Specifications
Ignition timing	15° ± 5° BTDC (in "P" or "N" position)
Target idle speed	650 ± 50 rpm (in "P" or "N" position)

OK or NG

OK >> GO TO 5.

NG >> Follow the EC-86, "Basic Inspection".

5. CHECK INJECTORS

- Stop engine and then turn ignition switch "ON". 1.
- Check voltage between ECM terminals 1, 2, 3, 11, 12, 13 and ground with CONSULT-II or tester.

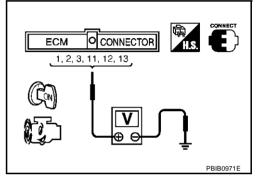
Battery voltage should exist.

3. Refer to Wiring Diagram for Injectors, EC-602.

OK or NG

OK >> GO TO 6.

NG >> Perform EC-603, "Diagnostic Procedure".



6. CHECK IGNITION SPARK

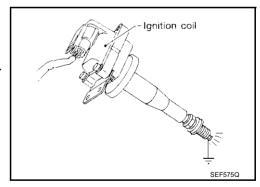
- 1. Turn ignition switch "OFF".
- 2. Disconnect ignition coil assembly from rocker cover.
- Connect a known good spark plug to the ignition coil assembly.
- Place end of spark plug against a suitable ground and crank engine.
- Check for spark.

OK or NG

OK >> GO TO 7.

NG

>> Check ignition coil with power transistor and their circuit. Refer to EC-589, "IGNITION SIGNAL"



7. CHECK INJECTOR

- Turn ignition switch "OFF". 1.
- Remove injector assembly.

Refer to EM-37, "FUEL INJECTOR AND FUEL TUBE".

Keep fuel hose and all injectors connected to injector gallery.

- 3. Disconnect all ignition coil harness connectors.
- Turn ignition switch "ON".

Make sure fuel does not drip from injector.

OK or NG

OK (Does not drip.)>>GO TO 8.

NG (Drips.)>>Replace the injector(s) from which fuel is dripping.

DTC P0420, P0430 THREE WAY CATALYST FUNCTION

[TYPE 1]

8. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

Trouble is fixed.>>INSPECTION END

Trouble is not fixed.>>Replace three way catalyst assembly.

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DTC P0441 EVAP CONTROL SYSTEM

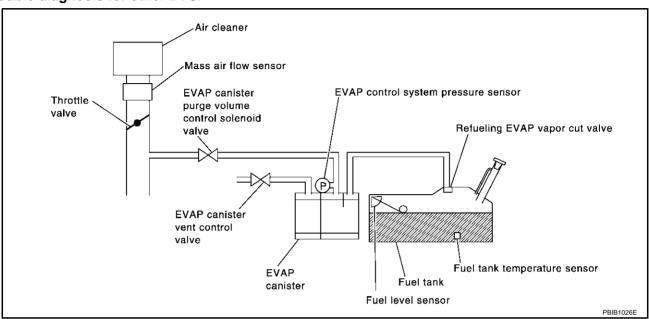
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System Description

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NOTE:

If DTC P0441 is displayed with other DTC such as P0226, P0227, P0228, P1227 or P1228, 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.

On Board Diagnosis Logic

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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
			EVAP canister purge volume control solenoid valve stuck closed
			EVAP control system pressure sensor and the circuit
		EVAP control system does not operate prop-	Loose, disconnected or improper con- nection of rubber tube
P0441	EVAP control system	erly, EVAP control system has a leak between	Blocked rubber tube
0441	incorrect purge flow	intake manifold and EVAP control system pressure sensor.	Cracked EVAP canister
		outo deficion.	EVAP canister purge volume control solenoid valve circuit
			Accelerator pedal position sensor
			Blocked purge port
			EVAP canister vent control valve

DTC Confirmation Procedure

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CAUTION:

Always drive vehicle at a safe speed.

NOTE

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Always perform test at a temperature of 5°C (41°F) or more.

[TYPE 1]

(A) WITH CONSULT-II

- Start engine and warm it up to normal operating temperature.
- 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 CONFIRMATION" mode with CON-SULT-II.
- 5. Touch "START". If "COMPLETED" is displayed, go to step 7.
- When the following conditions are met, "TESTING" will be displayed on the CONSULT-II screen. Maintain the conditions continuously until "TESTING" changes to "COMPLETED". (It will take at least 35 seconds.)

Selector lever	Suitable position
Vehicle speed	32 - 120 km/h (20 - 75 MPH)
ENG SPEED	500 - 3,000 rpm
B/FUEL SCHDL	1.3 - 9.0 msec
Engine coolant temperature	70 - 100°C (158 - 212°F)

PURG FLOW F	20441		PURG FLOW P	0441		PURG FLOW P0441	
OUT OF COND	ITION		TESTING				
MONITOR	ì	•	MONITOR		•	COMPLETED	
ENG SPEED	XXX rpm	•	ENG SPEED	XXX rpm	•		
B/FUEL SCHDL	XXX msec		B/FUEL \$CHDL	XXX msec			
COOLAN TEMP/S	xxx °C		COOLAN TEMP/S	XXX °C			
VHCL SPEED SE	XXX km/h		VHCL SPEED SE	XXX km/h			

If "TESTING" is not changed for a long time, retry from step 2.

7. Make sure that "OK" is displayed after touching "SELF-DIAG RESULTS". If "NG" is displayed, refer to EC-350, "Diagnostic Procedure".

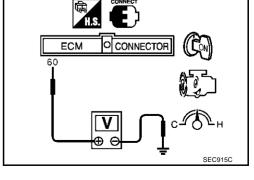
Overall Function Check

Use this procedure to check the overall monitoring function of the EVAP control system purge flow monitoring. During this check, a DTC might not be confirmed.

WITH GST

- 1. Lift up drive wheels.
- Start engine (VDC switch "OFF") and warm it up to normal operating temperature.
- Turn ignition switch "OFF", wait at least 10 seconds.
- Start engine and wait at least 70 seconds.
- Set voltmeter probes to ECM terminals 60 (EVAP control system pressure sensor signal) and ground.
- Check EVAP control system pressure sensor value at idle speed and note it.
- 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 0.1V less than the value at idle speed (measured at step 6) for at least 1 second.

EC-349 2003 G35 Sedan Revision; 2004 April

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9. If NG, go to EC-350, "Diagnostic Procedure".

Diagnostic Procedure

1. CHECK EVAP CANISTER

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- 1. Turn ignition switch "OFF".
- Check EVAP canister for cracks.

OK or NG

OK (With CONSULT-II)>>GO TO 2.

OK (Without CONSULT-II)>>GO TO 3.

NG >> Replace EVAP canister.

2. CHECK PURGE FLOW

(P) With CONSULT-II

- 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 <u>EC-636</u>, "EVAPORATIVE EMISSION LINE DRAWING".
- 2. Start engine and let it idle.
- 3. Select "PURG VOL CONT/V" in "ACTIVE TEST" mode with CONSULT-II.
- 4. Rev engine up to 2,000 rpm.
- 5. Touch "Qd" and "Qu" on CONSULT-II screen to adjust "PURG VOL CONT/V" opening and check vacuum existence.

PURG VOL CONT/V	Vacuum
100.0%	Should exist.
0.0%	Should not exist.

ACTIVE TE	 ST
PURG VOL CONT/V	0 %
MONITOR	l
ENG SPEED	XXX rpm
HO2S1 MNTR (B1)	LEAN
HO2S1 MNTR (B2)	LEAN
A/F ALPHA-B1	XXX %
A/F ALPHA-B2	XXX %

OK or NG

OK >> GO TO 7. NG >> GO TO 4.

3. CHECK PURGE FLOW

(P) Without CONSULT-II

- 1. 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 and install vacuum gauge. For the location of EVAP service port, refer to EC-636, "EVAPORATIVE EMISSION LINE DRAWING".
- 4. Start engine and let it idle for at least 80 seconds.
- 5. Check vacuum gauge indication when revving engine up to 2,000 rpm.

Vacuum should exist.

Release the accelerator pedal fully and let idle.

Vacuum should not exist.

OK or NG

OK >> GO TO 7.

NG >> GO TO 4.

4. CHECK EVAP PURGE LINE

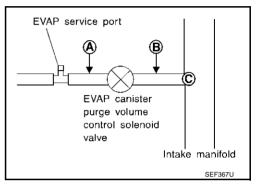
- 1. Turn ignition switch "OFF".
- 2. Check EVAP purge line for improper connection or disconnection. Refer to EC-636, "EVAPORATIVE EMISSION LINE DRAWING".

OK or NG

OK >> GO TO 5. NG >> Repair it.

5. CHECK EVAP PURGE HOSE AND PURGE PORT

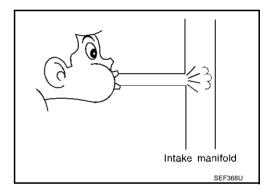
- 1. Disconnect purge hoses connected to EVAP service port **A** and EVAP canister purge volume control solenoid valve **B**.
- 2. Blow air into each hose and EVAP purge port C.



3. Check that air flows freely.

OK or NG

OK (With CONSULT-II)>>GO TO 6.
OK (Without CONSULT-II)>>GO TO 7.
NG >> Repair or clean hoses and/or purge port.



6. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

(P) With CONSULT-II

- Start engine.
- Perform "PURG VOL CONT/V" in "ACTIVE TEST" mode with CONSULT-II. Check that engine speed varies according to the valve opening.

OK or NG

OK >> GO TO 8. NG >> GO TO 7.

ACTIVE TES	Т
PURG VOL CONT/V	0 %
MONITOR	
ENG SPEED	XXX rpm
HO2S1 MNTR (B1)	LEAN
HO2S1 MNTR (B2)	LEAN
A/F ALPHA-B1	XXX %
A/F ALPHA-B2	XXX %

7. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-368, "Component Inspection".

OK or NG

OK >> GO TO 8.

NG >> Replace EVAP canister purge volume control solenoid valve.

Revision; 2004 April EC-351 2003 G35 Sedan

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8. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR CONNECTOR

- Disconnect EVAP control system pressure sensor harness connector.
- Check connectors for water.

Water should not exist.

OK or NG

OK >> GO TO 9.

NG >> Replace EVAP control system pressure sensor.

9. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR FUNCTION

Refer to "DTC Confirmation Procedure" for DTC P0452 EC-380, P0453 EC-386.

OK or NG

OK >> GO TO 10.

NG >> 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.

OK or NG

OK >> GO TO 11.

NG >> Clean the rubber tube using an air blower.

11. CHECK EVAP CANISTER VENT CONTROL VALVE

Refer to EC-374, "Component Inspection".

OK or NG

OK >> GO TO 12.

NG >> 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-636, "EVAPORATIVE EMISSION LINE DRAWING".

OK or NG

OK >> GO TO 13.

NG >> Replace it.

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 EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

[TYPE 1]

DTC P0442 EVAP CONTROL SYSTEM

PFP:14950

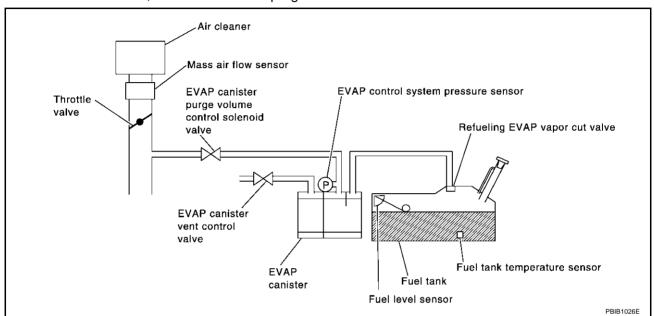
On Board Diagnosis Logic

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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.



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DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0442 0442	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 fails to 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
			Blocked or bent rubber tube to EVAP control system pressure sensor
			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
			Water separator
			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

CAUTION:

- Use only a genuine NISSAN fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the MIL may come on.
- If the fuel filler cap is not tightened properly, the MIL may come on.
- Use only a genuine NISSAN rubber tube as a replacement.

DTC Confirmation Procedure

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NOTE:

 If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

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).

(P) WITH CONSULT-II

- 1. Turn ignition switch "ON".
- 2. Turn ignition switch "OFF" and wait at least 10 seconds.
- Turn ignition switch "ON" and select "DATA MONITOR" mode with CONSULT-II.
- 4. Make sure 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 "EVAP SML LEAK P0442/P1442" of "EVAPORATIVE SYSTEM" in "DTC WORK SUPPORT" mode with CONSULT-II.

DTC P0442 EVAP CONTROL SYSTEM

[TYPE 1]

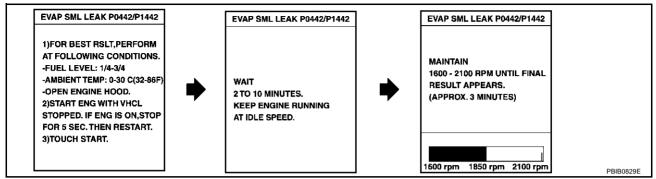
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Follow the instruction displayed.



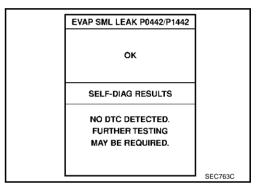
NOTE:

If the engine speed cannot be maintained within the range displayed on the CONSULT-II screen, go to EC-86, "Basic Inspection".

Make sure that "OK" is displayed. If "NG" is displayed, refer to EC-356, "Diagnostic Procedure".

NOTE:

Make sure that EVAP hoses are connected to EVAP canister purge volume control solenoid valve properly.



WITH GST

NOTE:

Be sure to read the explanation of "Driving Pattern" on EC-67 before driving vehicle.

- Start engine.
- Drive vehicle according to "Driving Pattern", EC-67.
- 3. Stop vehicle.
- 4. Select "MODE 1" with GST.
- If SRT of EVAP system is not set yet, go to the following step.
- If SRT of EVAP system is set, the result will be OK.
- Turn ignition switch "OFF" and wait at least 10 seconds. 5.
- Start engine.

It is not necessary to cool engine down before driving.

- Drive vehicle again according to the "Driving Pattern", EC-67.
- 8. Stop vehicle.
- Select "MODE 3" with GST.
- If P0442 is displayed on the screen, go to EC-356, "Diagnostic Procedure".
- If P0441 is displayed on the screen, go to "Diagnostic Procedure" for DTC P0441, EC-350.
- If P0441 and P0442 are not displayed on the screen, go to the following step.
- 10. Select "MODE 1" with GST.
- If SRT of EVAP system is set, the result will be OK.
- If SRT of EVAP system is not set, go to step 6.

Diagnostic Procedure

1. CHECK FUEL FILLER CAP DESIGN

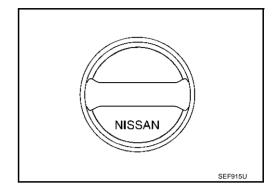
1. Turn ignition switch "OFF".

2. Check for genuine NISSAN fuel filler cap design.

OK or NG

OK >> GO TO 2.

NG >> 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.

OK or NG

OK >> GO TO 3.

NG >> 1. Open fuel filler cap, then clean cap and fuel filler neck threads using air blower.

2. Retighten until ratcheting sound is heard.

3. CHECK FUEL FILLER CAP FUNCTION

Check for air releasing sound while opening the fuel filler cap.

OK or NG

OK >> GO TO 5. NG >> GO TO 4.

4. CHECK FUEL TANK VACUUM RELIEF VALVE

Refer to EC-638, "FUEL TANK VACUUM RELIEF VALVE (BUILT INTO FUEL FULLER CAP)".

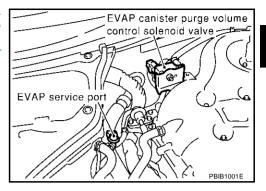
OK or NG

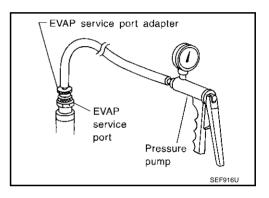
OK >> GO TO 5.

NG >> Replace fuel filler cap with a genuine one.

5. INSTALL THE PRESSURE PUMP

To locate the EVAP leak, install EVAP service port adapter and pressure pump to EVAP service port securely. For the location of EVAP service port, refer to EC-636, "EVAPORATIVE EMISSION LINE DRAWING".





NOTE:

Improper installation of the EVAP service port adapter to the EVAP service port may cause leaking.

Models with CONSULT-II>>GO TO 6. Models without CONSULT-II>>GO TO 7.

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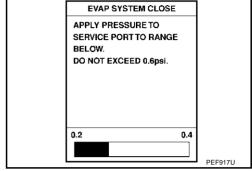
6. CHECK FOR EVAP LEAK

(II) With CONSULT-II

- 1. Turn ignition switch "ON".
- 2. Select "EVAP SYSTEM CLOSE" of "WORK SUPPORT" mode with CONSULT-II.
- 3. Touch "START" and apply pressure into the EVAP line until the pressure indicator reaches the middle of the bar graph.

NOTE:

- Never use compressed air or a high pressure pump.
- Do not exceed 4.12 kPa (0.042 kg/cm², 0.6 psi) of pressure in the system.



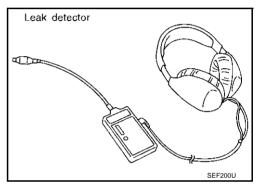
4. Using EVAP leak detector, locate the EVAP leak. For the leak detector, refer to the instruction manual for more details.

Refer to EC-636, "EVAPORATIVE EMISSION LINE DRAWING"

OK or NG

OK >> GO TO 8.

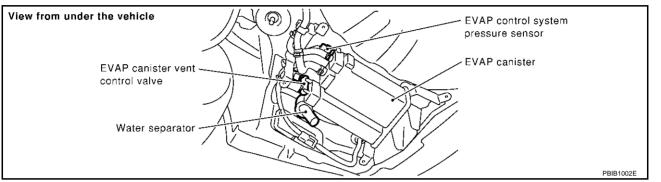
NG >> Repair or replace.



7. CHECK FOR EVAP LEAK

W Without CONSULT-II

- 1. Turn ignition switch "OFF".
- 2. Apply 12 volts DC to EVAP canister vent control valve. The valve will close. (Continue to apply 12 volts until the end of test.)



3. Pressurize the EVAP line using pressure pump with 1.3 to 2.7 kPa (10 to 20 mmHg, 0.39 to 0.79 inHg), then remove pump and EVAP service port adapter.

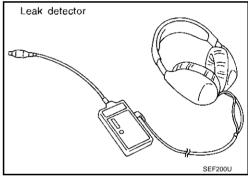
NOTE:

- Never use compressed air or a high pressure pump.
- Do not exceed 4.12 kPa (0.042 kg/cm², 0.6 psi) of pressure in the system.
- 4. Using EVAP leak detector, locate the EVAP leak. For the leak detector, refer to the instruction manual for more details. Refer to EC-636, "EVAPORATIVE EMISSION LINE DRAWING".

OK or NG

OK >> GO TO 8.

NG >> Repair or replace.



8. CHECK WATER SEPARATOR

Refer to EC-362, "Component Inspection".

OK or NG

OK >> GO TO 9.

NG >> Replace water separator.

9. CHECK EVAP CANISTER VENT CONTROL VALVE

Check the following.

- EVAP canister vent control valve is installed properly.
 Refer to <u>EC-639</u>, "<u>Removal and Installation</u>".
- EVAP canister vent control valve.
 Refer to <u>EC-374</u>, "Component Inspection".

OK or NG

OK >> GO TO 10.

NG >> Repair or replace EVAP canister vent control valve and O-ring.

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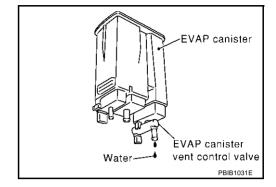
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10. CHECK IF EVAP CANISTER SATURATED WITH WATER

- Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
- 2. Does water drain from the EVAP canister?

Yes or No

Yes >> GO TO 11. No (With CONSULT-II)>>GO TO 13. No (Without CONSULT-II)>>GO TO 14.



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).

OK or NG

OK (With CONSULT-II)>>GO TO 13.
OK (Without CONSULT-II)>>GO TO 14.
NG >> GO TO 12.

12. DETECT MALFUNCTIONING PART

Check the following.

- EVAP canister for damage
- EVAP hose between EVAP canister and water separator for clogging or poor connection

>> Repair hose or replace EVAP canister.

13. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

(P) With CONSULT-II

- 1. Disconnect vacuum hose to EVAP canister purge volume control solenoid valve at EVAP service port.
- 2. Start engine.
- 3. Perform "PURG VOL CONT/V" in "ACTIVE TEST" mode.
- 4. Touch "Qu" on CONSULT-II screen to increase "PURG VOL CONT/V" opening to 100%.
- 5. Check vacuum hose for vacuum when revving engine up to 2,000 rpm.

OK or NG

OK >> GO TO 16. NG >> GO TO 15.

ACTIVE TES		
PURG VOL CONT/V	0 %	
MONITOR		
ENG SPEED	XXX rpm	
HO2S1 MNTR (B1)	LEAN	
HO2S1 MNTR (B2)	LEAN	
A/F ALPHA-B1	XXX %	
A/F ALPHA-B2	XXX %	
		DDID0447E
	•	PBIB0147E

DTC P0442 EVAP CONTROL SYSTEM

[TYPE 1]

14. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

(R) Without CONSULT-II

- Start engine and warm it up to normal operating temperature.
- 2. Stop engine.
- Disconnect vacuum hose to EVAP canister purge volume control solenoid valve at EVAP service port.
- Start engine and let it idle for at least 80 seconds.
- Check vacuum hose for vacuum when revving engine up to 2,000 rpm.

Vacuum should exist.

OK or NG

OK >> GO TO 17. NG >> GO TO 15.

15. CHECK VACUUM HOSE

Check vacuum hoses for clogging or disconnection. Refer to EC-31, "Vacuum Hose Drawing".

OK or NG

>> GO TO 16. OK

NG >> Repair or reconnect the hose.

16. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-368. "Component Inspection".

OK or NG

OK >> GO TO 17.

NG >> Replace EVAP canister purge volume control solenoid valve.

17. CHECK FUEL TANK TEMPERATURE SENSOR

Refer to EC-285, "Component Inspection".

OK or NG

OK >> GO TO 18.

NG >> Replace fuel level sensor unit.

18. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-384, "Component Inspection".

OK or NG

OK >> GO TO 19.

NG >> Replace EVAP control system pressure sensor.

19. check evap purge line

Check EVAP purge line (pipe, rubber tube, fuel tank and EVAP canister) for cracks or improper connection. Refer to EC-636, "EVAPORATIVE EMISSION LINE DRAWING".

OK or NG

OK >> GO TO 20.

NG >> Repair or reconnect the hose.

20. CLEAN EVAP PURGE LINE

Clean EVAP purge line (pipe and rubber tube) using air blower.

>> GO TO 21.

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21. CHECK EVAP/ORVR LINE

Check EVAP/ORVR line between EVAP canister and fuel tank for clogging, kink, looseness and improper connection. For location, refer to <u>EC-642</u>, "ON BOARD REFUELING VAPOR RECOVERY (ORVR)".

OK or NG

OK >> GO TO 22.

NG >> Repair or replace hoses and tubes.

22. CHECK RECIRCULATION LINE

Check recirculation line between filler neck tube and fuel tank for clogging, kink, cracks, looseness and improper connection.

OK or NG

OK >> GO TO 23.

NG >> Repair or replace hose, tube or filler neck tube.

23. CHECK REFUELING EVAP VAPOR CUT VALVE

Refer to EC-646, "REFUELING EVAP VAPOR CUT VALVE".

OK or NG

OK >> GO TO 24.

NG >> Replace refueling EVAP vapor cut valve with fuel tank.

24. CHECK FUEL LEVEL SENSOR

Refer to DI-21, "FUEL LEVEL SENSOR UNIT CHECK".

OK or NG

OK >> GO TO 25.

NG >> Replace fuel level sensor unit.

25. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

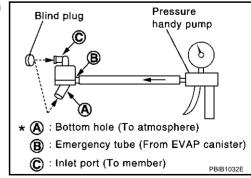
Component Inspection WATER SEPARATOR

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- 1. Check visually for insect nests in the water separator air inlet.
- 2. Check visually for cracks or flaws in the appearance.
- 3. Check visually for cracks or flaws in the hose.
- 4. Check that **A** and **C** are not clogged by blowing air into **B** with **A**, and then **C** plugged.
- 5. In case of NG in items 2 4, replace the parts.

NOTE:

Do not disassemble water separator.



[TYPE 1]

DTC P0444, P0445 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Description SYSTEM DESCRIPTION

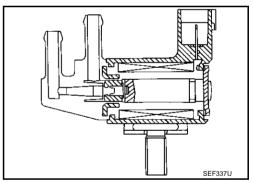
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Sensor	Input Signal to ECM	ECM function	Actuator	
Crankshaft position sensor (POS) Camshaft position sensor (PHASE)	Engine speed			
Mass air flow sensor	Amount of intake air			
Engine coolant temperature sensor	Engine coolant temperature			
Ignition switch	Start signal	EVAP canister	EVAP canister purge volume	
Throttle position sensor	Throttle position	purge flow control	control solenoid valve	
Accelerator pedal position sensor	Accelerator pedal position			
Heated oxygen sensors 1	Density of oxygen in exhaust gas (Mixture ratio feedback signal)			
Vehicle speed signal	Vehicle speed			

This system controls flow rate of fuel vapor from the EVAP canister. The opening of the vapor by-pass passage in the EVAP canister purge volume control solenoid valve changes to control the flow rate. The EVAP canister purge volume control solenoid valve repeats ON/OFF operation according to the signal sent from the ECM. The opening of the valve varies for optimum engine control. The optimum value stored in the ECM is determined by considering various engine conditions. When the engine is operating, the flow rate of fuel vapor from the EVAP canister is regulated as the air flow changes.

COMPONENT DESCRIPTION

The EVAP canister purge volume control solenoid valve uses a ON/ OFF duty 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.



CONSULT-II Reference Value in Data Monitor Mode

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Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
PURG VOL C/V	Engine: After warming up	Idle	0%
	Shift lever: N		
	Air conditioner switch: OFF	2,000 rpm	_
	No-load		

Revision; 2004 April EC-363 2003 G35 Sedan

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[TYPE 1]

On Board Diagnosis Logic

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DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0444 0444	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.)
0444			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.)
0445			EVAP canister purge volume control solenoid valve

DTC Confirmation Procedure

ABS000AI

NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Before performing the following procedure, confirm battery voltage is more than 11V at idle.

(III) WITH CONSULT-II

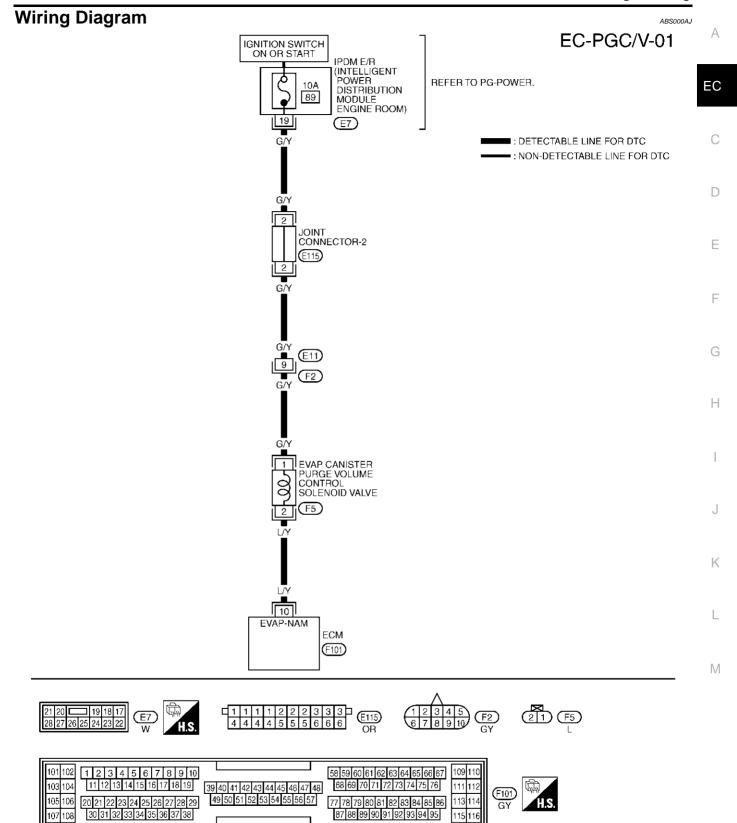
- 1. Turn ignition switch "ON".
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- 3. Start engine and let it idle for at least 13 seconds.
- 4. If 1st trip DTC is detected, go to EC-366, "Diagnostic Procedure"

DATA M	DATA MONITOR	
MONITOR	NO DTC	
ENG SPEED	XXX rpm	1
		SEF058Y

WITH GST

Follow the procedure "WITH CONSULT-II" above.

[TYPE 1]



TBWT0158E

[TYPE 1]

Specification data are reference values and are measured between each terminal and ground. Pulse signal is measured by CONSULT-II.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
10	L/Y	EVAP canister purge vol-	[Engine is running] • Idle speed	BATTERY VOLTAGE (11 - 14V)*
	J.	ume control solenoid valve	 [Engine is running] ● Engine speed is about 2,000 rpm (More than 100 seconds after starting engine). 	BATTERY VOLTAGE (11 - 14V)* **********************************

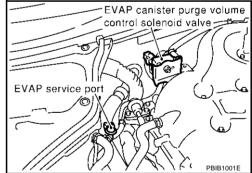
^{★:} Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

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1. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE POWER SUPPLY CIR-CUIT

- 1. Turn ignition switch "OFF".
- 2. Disconnect EVAP canister purge volume control solenoid valve harness connector.
- 3. Turn ignition switch "ON".

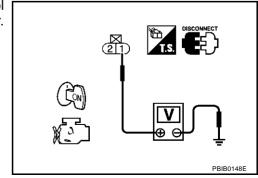


4. Check voltage between EVAP canister purge volume control solenoid valve terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 3. NG >> GO TO 2.



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2. detect malfunctioning part

Check the following.

- Harness connectors E11, F2
- Joint connector-2
- IPDM E/R harness connector E7
- 10A fuse
- Harness for open or short between EVAP canister purge volume control solenoid valve and IPDM E/R
 - >> Repair harness or connectors.

3. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OUTPUT SIGNAL CIR-**CUIT FOR OPEN AND SHORT**

- 1. Turn ignition switch "OFF".
- Disconnect ECM harness connector.
- Check harness continuity between ECM terminal 10 and EVAP canister purge volume control solenoid valve terminal 2. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK (With CONSULT-II)>>GO TO 4.

OK (Without CONSULT-II)>>GO TO 5.

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

4. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

(P) With CONSULT-II

- 1. Reconnect all harness connectors disconnected.
- Start engine.
- Perform "PURG VOL CONT/V" in "ACTIVE TEST" mode with CONSULT-II. Check that engine speed varies according to the valve opening.

OK or NG

>> GO TO 6

OK	<i>>></i> GO 10 6.
NG	>> GO TO 5.

ACTIVE TEST	
PURG VOL CONT/V	0 %
MONITOR	
ENG SPEED	XXX rpm
HO2S1 MNTR (B1)	LEAN
HO2S1 MNTR (B2)	LEAN
A/F ALPHA-B1	XXX %
A/F ALPHA-B2	XXX %

5. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-368, "Component Inspection".

OK or NG

OK >> GO TO 6.

NG >> Replace EVAP canister purge volume control solenoid valve.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

EC-367 Revision; 2004 April 2003 G35 Sedan

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[TYPE 1]

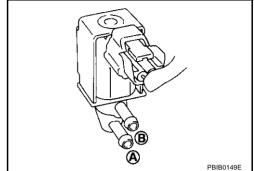
Component Inspection EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

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(P) With CONSULT-II

Check air passage continuity of EVAP canister purge volume control solenoid valve under the following conditions.

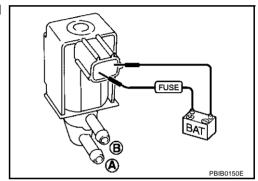
Condition (PURG VOL CONT/V value)	Air passage continuity between A and B
100%	Yes
0%	No



® Without CONSULT-II

Check air passage continuity of EVAP canister purge volume control solenoid valve under the following conditions.

Condition	Air passage continuity between A and B
12V direct current supply between terminals 1 and 2	Yes
No supply	No



Removal and Installation EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

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Refer to EM-18, "INTAKE MANIFOLD COLLECTOR" .

PFP:14935

Component Description

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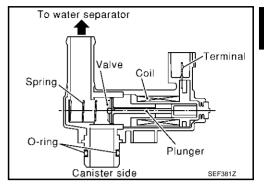
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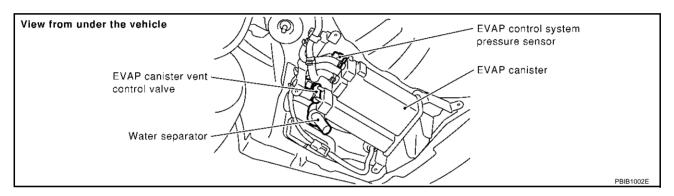
The EVAP canister vent control valve is located on the EVAP canister and is used to seal the canister vent.

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.





CONSULT-II Reference Value in Data Monitor Mode

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Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
VENT CONT/V	• Ignition switch: ON	OFF

On Board Diagnosis Logic

ABS000AP

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0447 0447	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

[TYPE 1]

DTC Confirmation Procedure

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NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Before performing the following procedure, confirm battery voltage is more than 11V at idle.

(P) WITH CONSULT-II

- 1. Turn ignition switch "ON".
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- 3. Start engine and wait at least 8 seconds.
- 4. If 1st trip DTC is detected, go to EC-372, "Diagnostic Procedure"

DATA MONITOR

MONITOR

NO DTC

ENG SPEED

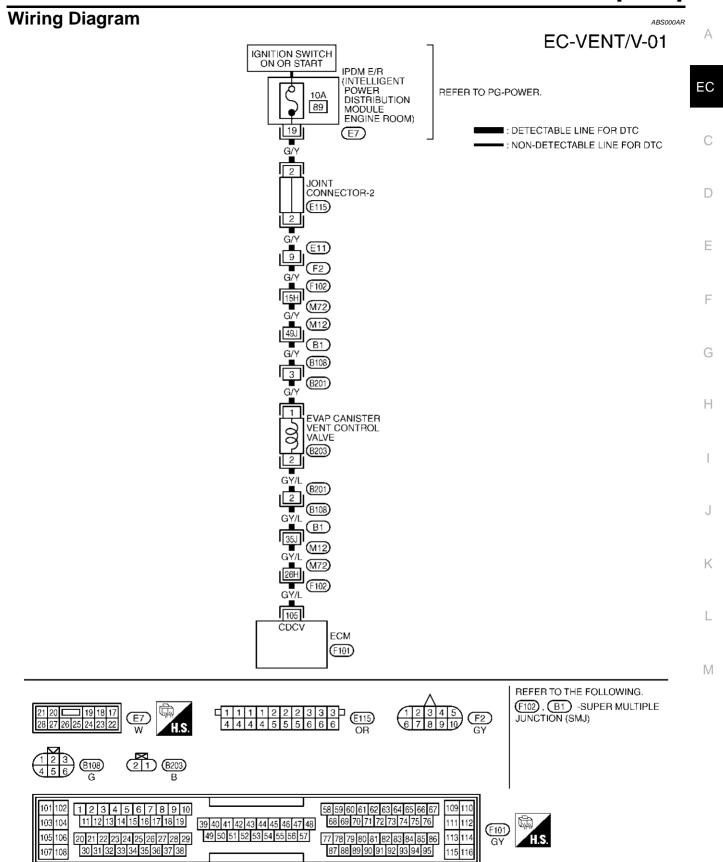
XXX rpm

SEF058Y

WITH GST

Follow the procedure "WITH CONSULT-II" above.

[TYPE 1]



TBWT0159E

[TYPE 1]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
105	GY/L	EVAP canister vent control valve	[Ignition switch "ON"]	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

ABSOOOAS

1. INSPECTION START

Do you have CONSULT-II?

Yes or No

Yes >> GO TO 2. No >> GO TO 3.

2. CHECK EVAP CANISTER VENT CONTROL VALVE CIRCUIT

(P) With CONSULT-II

- 1. Turn ignition switch "OFF" and then turn "ON".
- Select "VENT CONTROL/V" in "ACTIVE TEST" mode with CONSULT-II.
- 3. Touch "ON/OFF" on CONSULT-II screen.
- 4. Check for operating sound of the valve. Clicking noise should be heard.

OK or NG

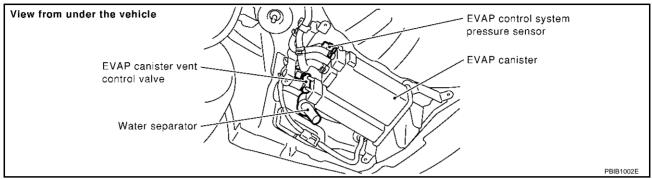
OK >> GO TO 7. NG >> GO TO 3.

ACTIVE TEST		
VENT CONTROL/V	OFF	
MONITOR		
ENG SPEED	XXX rpm	
A/F ALPHA-B1	XXX %	
A/F ALPHA-B2	XXX %	
HO2S1 (B1)	xxx v	
HO2S1 (B2)	xxx v	
	_	PBIB0151

ITYPE 11

$\overline{3}$. CHECK EVAP CANISTER VENT CONTROL VALVE POWER SUPPLY CIRCUIT

- Turn ignition switch "OFF".
- Disconnect EVAP canister vent control valve harness connector.

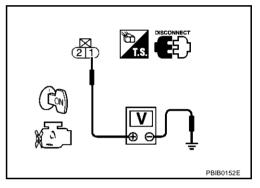


- Turn ignition switch "ON". 3.
- Check voltage between EVAP canister vent control valve terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

>> GO TO 5. OK NG >> GO TO 4.



4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E11, F2
- Harness connectors F102, M72
- Harness connectors M12, B1
- Harness connectors B108, B201
- Joint connector-2
- IPDM E/R harness connector E7
- 10A fuse
- Harness for open or short between EVAP canister vent control valve and IPDM E/R
 - >> Repair 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.
- Check harness continuity between ECM terminal 105 and EVAP canister vent control valve terminal 2. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 7.

NG >> GO TO 6.

EC-373 Revision; 2004 April 2003 G35 Sedan

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[TYPE 1]

ABS000AT

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F102, M72
- Harness connectors M12, B1
- Harness connectors B108, B201
- Harness for open or short between EVAP canister vent control valve and ECM
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK RUBBER TUBE FOR CLOGGING

- 1. Disconnect rubber tube connected to EVAP canister vent control valve.
- 2. Check the rubber tube for clogging.

OK or NG

OK >> GO TO 8.

NG >> Clean the rubber tube using an air blower.

8. CHECK EVAP CANISTER VENT CONTROL VALVE

Refer to EC-374, "Component Inspection".

OK or NG

OK >> GO TO 9.

NG >> Replace EVAP canister vent control valve.

9. CHECK INTERMITTENT INCIDENT

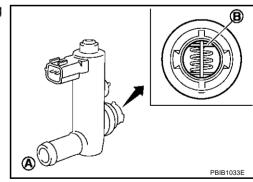
Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

Component Inspection EVAP CANISTER VENT CONTROL VALVE

(With CONSULT-II

- 1. Remove EVAP canister vent control valve from EVAP canister.
- Check portion B of EVAP canister vent control valve for being rusted.
 - If NG, replace EVAP canister vent control valve.
 - If OK, go to next step.
- Reconnect harness connectors disconnected.
- 4. Turn ignition switch "ON".



[TYPE 1]

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- 5. Perform "VENT CONTROL/V" in "ACTIVE TEST" mode.
- 6. Check air passage continuity and operation delay time.

 Make sure new O-ring is installed properly.

Condition VENT CONTROL/V	Air passage continuity between A and B
ON	No
OFF	Yes

and B	

ACTIVE TEST

Operation takes less than 1 second.

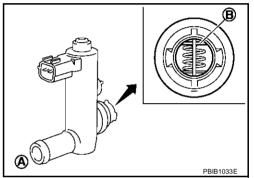
If NG, replace EVAP canister vent control valve.

If OK, go to next step.

- 7. Clean the air passage (Portion A to B) of EVAP canister vent control valve using an air blower.
- 8. Perform step 6 again.

⊗ Without CONSULT-II

- 1. Remove EVAP canister vent control valve from EVAP canister.
- 2. Check portion **B** of EVAP canister vent control valve for being rusted.



3. Check air passage continuity and operation delay time under the following conditions.

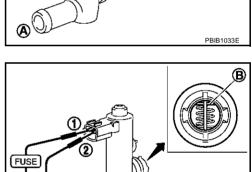
Make sure new O-ring is installed properly.

Condition	Air passage continuity between A and B
12V direct current supply between terminals 1 and 2	No
OFF	Yes



If NG, replace EVAP canister vent control valve. If OK, go to next step.

- 4. Clean the air passage (Portion A to B) of EVAP canister vent control valve using an air blower.
- 5. Perform step 3 again.



BATTERY

M

PBIB1034E

[TYPE 1]

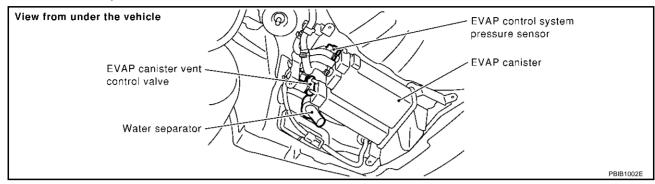
DTC P0451 EVAP CONTROL SYSTEM PRESSURE SENSOR

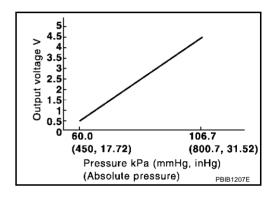
PFP:22365

Component Description

ARS004W8

The EVAP control system pressure sensor detects pressure in the purge line. The sensor output voltage to the ECM increases as pressure increases.





CONSULT-II Reference Value in Data Monitor Mode

ABS004W9

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
EVAP SYS PRES	Ignition switch: ON	Approx. 1.8 - 4.8V

On Board Diagnosis Logic

ABS004WA

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0451 0451	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

ITYPE 11

DTC Confirmation Procedure

ABS004WB

NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

(A) WITH CONSULT-II

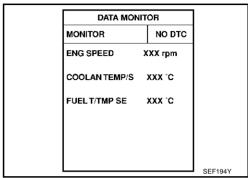
- Turn ignition switch "OFF" and wait at least 10 seconds.
- Turn ignition switch "ON" and select "DATA MONITOR" mode with CONSULT-II.
- 3. Start engine and wait at least 40 seconds.

NOTE:

Do not depress accelerator pedal even slightly.

If 1st trip DTC is detected, go to EC-377, "Diagnostic Procedure"

COOLAN TEMP/S FUELT/TMP SE



® WITH GST

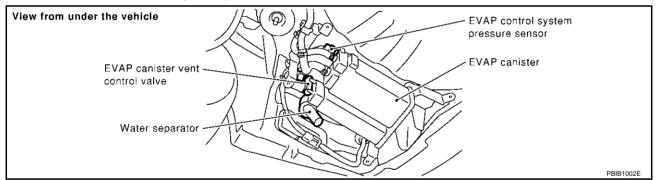
Follow the procedure "WITH CONSULT-II" above.

Diagnostic Procedure

ABS004WC

1. CHECK EVPA CONTROL SYSTEM PRESSURE SENSOR CONNECTOR FOR WATER

Disconnect EVAP control system pressure sensor harness connector.



Check sensor harness connector for water.

Water should not exist.

OK or NG

OK >> GO TO 2.

NG >> Repair or replace harness connector.

2. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-378, "Component Inspection".

OK or NG

OK >> GO TO 3.

NG >> Replace EVAP control system pressure sensor.

3. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT". For wiring diagram, refer to EC-381.

>> INSPECTION END

EC-377 Revision; 2004 April 2003 G35 Sedan

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[TYPE 1]

Component Inspection EVAP CONTROL SYSTEM PRESSURE SENSOR

ABS004WD

- 1. Remove EVAP control system pressure sensor with its harness connector connected.
- 2. Remove EVAP control system pressure sensor from EVAP canister. **Do not reuse the O-ring, replace it 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 terminal 60 and ground under the following conditions.

Applied vacuum kPa (mmHg, inHg)	Voltage V
Not applied	1.8 - 4.8
-26.7 (-200, -7.87)	2.1 to 2.5V lower than above value

EVAP control system pressure sensor Pump SECONDECTOR 60 V SECONDECTOR

CAUTION:

- Always calibrate the vacuum pump gauge when using it.
- Do not apply below -93.3 kPa (-700 mmHg, -27.56 inHg) or pressure over 101.3 kPa (760 mmHg, 29.92 inHg).
- 5. If NG, replace EVAP control system pressure sensor.

[TYPE 1]

DTC P0452 EVAP CONTROL SYSTEM PRESSURE SENSOR

PFP:25085

Component Description

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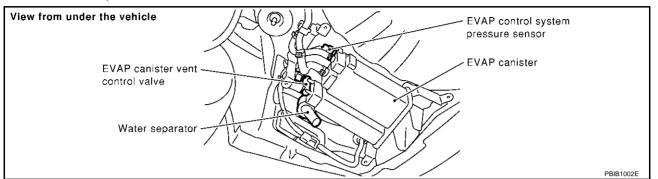
EC

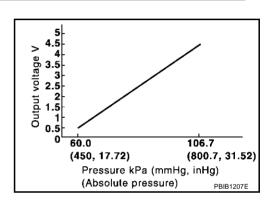
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The EVAP control system pressure sensor detects pressure in the purge line. The sensor output voltage to the ECM increases as pressure increases.





CONSULT-II Reference Value in Data Monitor Mode

ABS000AV

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
EVAP SYS PRES	Ignition switch: ON	Approx. 1.8 - 4.8V

On Board Diagnosis Logic

ABS000AW

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0452 0452	EVAP control system pressure sensor low input	An excessively low voltage from the sensor is sent to ECM.	 Harness or connectors (The sensor circuit is open or shorted.) EVAP control system pressure sensor

[TYPE 1]

ABS000AX

DTC Confirmation Procedure

NOTE:

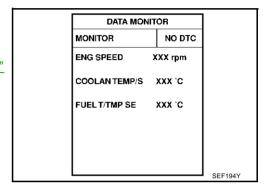
If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Always perform test at a temperature of 5°C (41°F) or more.

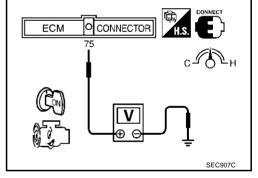
(P) WITH CONSULT-II

- 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. Select "DATA MONITOR" mode with CONSULT-II.
- 5. Make sure that "FUEL T/TEMP SE" is more than 0°C (32°F).
- Start engine and wait at least 20 seconds.
 If 1st trip DTC is detected, go to <u>EC-382</u>, "<u>Diagnostic Procedure</u>"

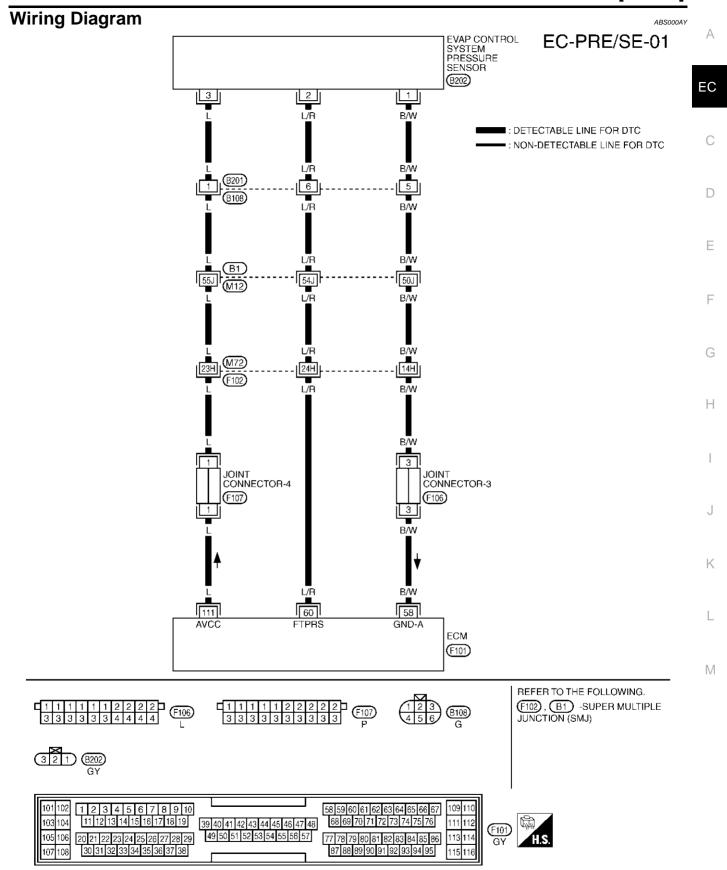


WITH GST

- 1. Start engine and warm it up to normal operating temperature.
- 2. Check that voltage between ECM terminal 75 (Fuel tank temperature sensor signal) and ground is less than 4.2V.
- 3. Turn ignition switch "OFF" and wait at least 10 seconds.
- Start engine and wait at least 20 seconds.
- Select "MODE 7" with GST.
 If 1st trip DTC is detected, go to <u>EC-382</u>, "<u>Diagnostic Procedure</u>"



[TYPE 1]



TBWT0160E

[TYPE 1]

ARSONAZ

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

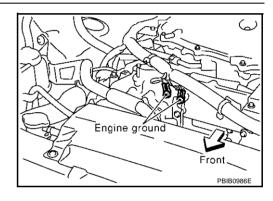
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
58	B/W	Sensors' ground	[Engine is running]Warm-up conditionIdle speed	Approximately 0V
60	L/R	EVAP control system pressure sensor	[Ignition switch "ON"]	Approximately 1.8 - 4.8V
111	L	Sensors' power supply	[Ignition switch "ON"]	Approximately 5V

Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

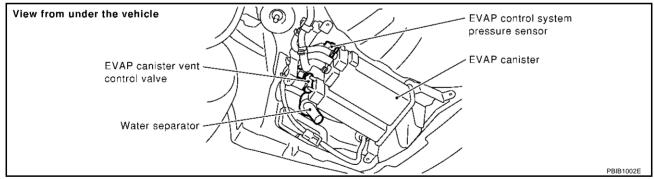
Loosen and retighten engine ground screws.

>> GO TO 2.



2. CHECK CONNECTOR

1. Disconnect EVAP control system pressure sensor harness connector.



2. Check sensor harness connector for water.

Water should not exist.

OK or NG

OK >> GO TO 3.

NG >> Repair or replace harness connector.

[TYPE 1]

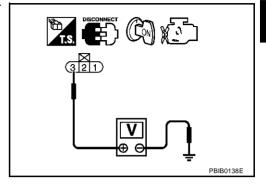
3. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT

- 1. Turn ignition switch "ON".
- 2. Check voltage between EVAP control system pressure sensor terminal 3 and ground with CONSULT-II or tester.

Voltage: Approximately 5V

OK or NG

OK >> GO TO 5. NG >> GO TO 4.



4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B201, B108
- Harness connectors B1, M12
- Harness connectors M72, F102
- Joint connector-4
- Harness for open or short between EVAP control system pressure sensor and ECM
 - >> Repair harness or connectors.

5. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch "OFF".
- Check harness continuity between EVAP control system pressure sensor terminal 1 and engine ground. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 7. NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B201, B108
- Harness connectors B1, M12
- Harness connectors M72, F102
- Joint connector-3
- Harness for open or short between EVAP control system pressure sensor and ECM
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

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[TYPE 1]

7. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Disconnect ECM harness connector.
- Check harness continuity between ECM terminal 60 and EVAP control system pressure sensor terminal
 2.

Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 9. NG >> GO TO 8.

8. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B201, B108
- Harness connectors B1, M12
- Harness connectors M72, F102
- Harness for open or short between EVAP control system pressure sensor and ECM
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

9. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-384, "Component Inspection".

OK or NG

OK >> GO TO 10.

NG >> Replace EVAP control system pressure sensor.

10. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

Component Inspection EVAP CONTROL SYSTEM PRESSURE SENSOR

ABS000B0

- 1. Remove EVAP control system pressure sensor with its harness connector connected.
- Remove EVAP control system pressure sensor from EVAP canister.

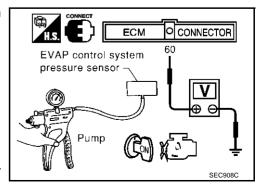
Do not reuse the O-ring, replace it with a new one.

- 3. Install a vacuum pump to EVAP control system pressure sensor.
- 4. Turn ignition switch "ON" and check output voltage between ECM terminal 60 and ground under the following conditions.

Applied vacuum kPa (mmHg, inHg)	Voltage V
Not applied	1.8 - 4.8
-26.7 (-200, -7.87)	2.1 to 2.5V lower than above value

CAUTION:

- Always calibrate the vacuum pump gauge when using it.
- Do not apply below -93.3 kPa (-700 mmHg, -27.56 inHg) or pressure over 101.3 kPa (760 mmHg, 29.92 inHg).
- 5. If NG, replace EVAP control system pressure sensor.



[TYPE 1]

DTC P0453 EVAP CONTROL SYSTEM PRESSURE SENSOR

PFP:25085

Component Description

AB\$000B1

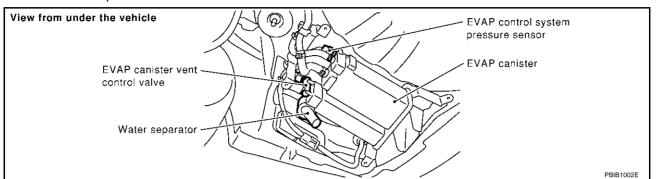
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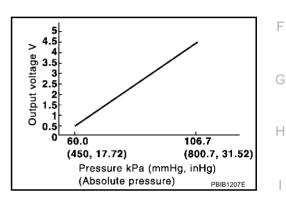
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The EVAP control system pressure sensor detects pressure in the purge line. The sensor output voltage to the ECM increases as pressure increases.





CONSULT-II Reference Value in Data Monitor Mode

ABS000B2

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
EVAP SYS PRES	Ignition switch: ON	Approx. 1.8 - 4.8V

On Board Diagnosis Logic

ABS000B3

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0453 0453	EVAP control system pressure sensor high input	An excessively high voltage from the sensor is sent to ECM.	 Harness or connectors (The sensor circuit is open or shorted.) EVAP control system pressure sensor EVAP canister vent control valve EVAP canister Water separator Rubber hose from EVAP canister vent control valve to water separator

[TYPE 1]

DTC Confirmation Procedure

ABS000B4

NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Always perform test at a temperature of 5°C (41°F) or more.

(II) WITH CONSULT-II

- 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. Select "DATA MONITOR" mode with CONSULT-II.
- 5. Make sure that "FUEL T/TEMP SE" is more than 0°C (32°F).
- 6. Start engine and wait at least 20 seconds.
- 7. If 1st trip DTC is detected, go to EC-388, "Diagnostic Procedure"

DATA MONITOR

MONITOR

NO DTC

ENG SPEED XXX rpm

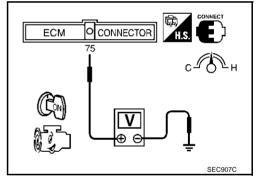
COOLAN TEMP/S XXX °C

FUEL T/TMP SE XXX °C

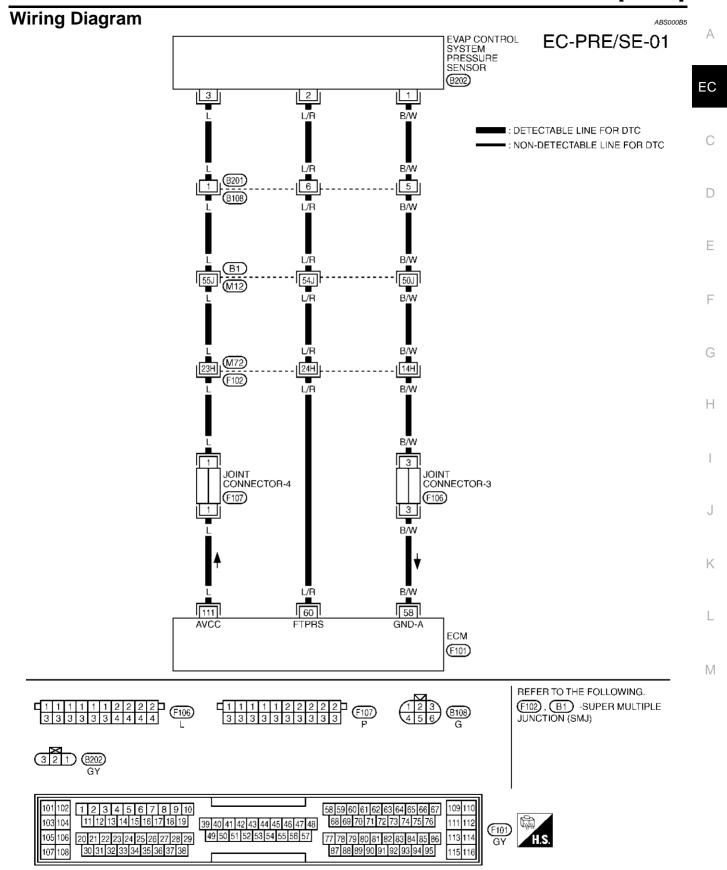
SEF194Y

WITH GST

- 1. Start engine and warm it up to normal operating temperature.
- 2. Check that voltage between ECM terminal 75 (Fuel tank temperature sensor signal) and ground is less than 4.2V.
- 3. Turn ignition switch "OFF" and wait at least 10 seconds.
- 4. Start engine and wait at least 20 seconds.
- Select "MODE 7" with GST.
 If 1st trip DTC is detected, go to <u>EC-388</u>, "<u>Diagnostic Procedure</u>"



[TYPE 1]



TBWT0160E

[TYPE 1]

ARSOORE

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

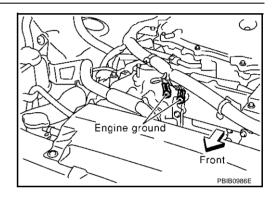
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
58	B/W	Sensors' ground	[Engine is running]Warm-up conditionIdle speed	Approximately 0V
60	L/R	EVAP control system pressure sensor	[Ignition switch "ON"]	Approximately 1.8 - 4.8V
111	L	Sensors' power supply	[Ignition switch "ON"]	Approximately 5V

Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

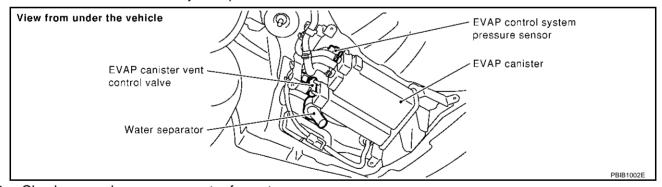
Loosen and retighten engine ground screws.

>> GO TO 2.



2. CHECK CONNECTOR

1. Disconnect EVAP control system pressure sensor harness connector.



2. Check sensor harness connector for water.

Water should not exist.

OK or NG

OK >> GO TO 3.

NG >> Repair or replace harness connector.

[TYPE 1]

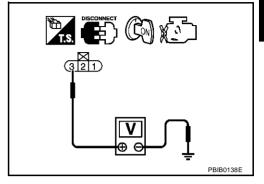
3. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT

- 1. Turn ignition switch "ON".
- 2. Check voltage between EVAP control system pressure sensor terminal 3 and ground with CONSULT-II or tester.

Voltage: Approximately 5V

OK or NG

OK >> GO TO 5. NG >> GO TO 4.



4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B201, B108
- Harness connectors B1, M12
- Harness connectors M72, F102
- Joint connector-4
- Harness for open or short between EVAP control system pressure sensor and ECM
 - >> Repair harness or connectors.

5. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch "OFF".
- Check harness continuity between EVAP control system pressure sensor terminal 1 and engine ground. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 7. NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B20, B108
- Harness connectors B1, M12
- Harness connectors M72, F102
- Joint connector-3
- Harness for open or short between EVAP control system pressure sensor and ECM
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

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[TYPE 1]

7. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Disconnect ECM harness connector.
- Check harness continuity between ECM terminal 60 and EVAP control system pressure sensor terminal 2.

Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 9. NG >> GO TO 8.

8. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B201, B108
- Harness connectors B1, M12
- Harness connectors M72, F102
- Harness for open or short between EVAP control system pressure sensor and ECM
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

9. CHECK RUBBER TUBE FOR CLOGGING

- 1. Disconnect rubber tube connected to EVAP canister vent control valve.
- 2. Check the rubber tube for clogging.

OK or NG

OK >> GO TO 10.

NG >> Clean the rubber tube using an air blower.

10. CHECK EVAP CANISTER VENT CONTROL VALVE

Refer to EC-374, "Component Inspection".

OK or NG

OK >> GO TO 11.

NG >> Replace EVAP canister vent control valve.

11. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-392, "Component Inspection".

OK or NG

OK >> GO TO 12.

NG >> Replace EVAP control system pressure sensor.

12. CHECK RUBBER TUBE

Check obstructed rubber tube connected to EVAP canister vent control valve.

OK or NG

OK >> GO TO 13.

NG >> Clean rubber tube using an air blower, repair or replace rubber tube.

[TYPE 1]

13. CHECK WATER SEPARATOR

Refer to EC-362, "Component Inspection".

OK or NG

OK >> GO TO 14.

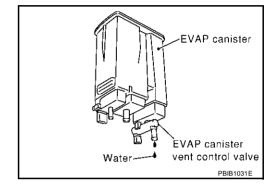
NG >> Replace water separator.

14. CHECK IF EVAP CANISTER 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.

Yes or No

Yes >> GO TO 15. No >> GO TO 17.



15. 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).

OK or NG

OK >> GO TO 17. NG >> GO TO 16.

16. DETECT MALFUNCTIONING PART

Check the following.

- EVAP canister for damage
- EVAP hose between EVAP canister and water separator for clogging or poor connection
 - >> Repair hose or replace EVAP canister.

17. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

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[TYPE 1]

Component Inspection EVAP CONTROL SYSTEM PRESSURE SENSOR

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- 1. Remove EVAP control system pressure sensor with its harness connector connected.
- 2. Remove EVAP control system pressure sensor from EVAP canister. **Do not reuse the O-ring, replace it 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 terminal 60 and ground under the following conditions.

Applied vacuum kPa (mmHg, inHg)	Voltage V	
Not applied	1.8 - 4.8	
-26.7 (-200, -7.87)	2.1 to 2.5V lower than above value	

EVAP control system pressure sensor Pump Pump

CAUTION:

- Always calibrate the vacuum pump gauge when using it.
- Do not apply below -93.3 kPa (-700 mmHg, -27.56 inHg) or pressure over 101.3 kPa (760 mmHg, 29.92 inHg).
- 5. If NG, replace EVAP control system pressure sensor.

[TYPE 1]

DTC P0455 EVAP CONTROL SYSTEM

On Board Diagnosis Logic

PFP:14950

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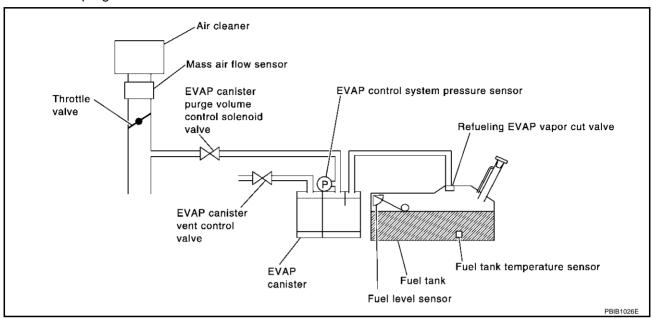
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This diagnosis detects a very large leak (fuel filler cap fell off etc.) in EVAP system between the fuel tank and EVAP canister purge volume control solenoid valve.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
			Fuel filler cap remains open or fails to 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
P0455 0455	EVAP control system		EVAP purge line rubber tube bent.
J455	gross leak detected		Blocked or bent rubber tube to EVAP control system pressure sensor
			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 come on.
- If the fuel filler cap is not tightened properly, the MIL may come on.
- Use only a genuine NISSAN rubber tube as a replacement.

DTC Confirmation Procedure

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CAUTION:

Never remove fuel filler cap during the DTC Confirmation Procedure.

NOTE:

- Make sure that EVAP hoses are connected to EVAP canister purge volume control solenoid valve properly.
- If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

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.

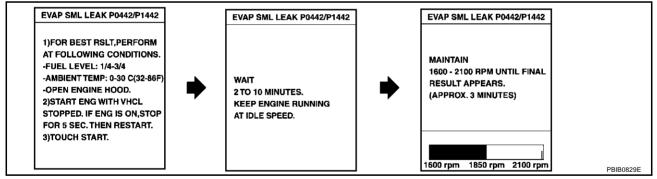
(III) WITH CONSULT-II

- 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-II.
- 5. Make sure 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 "EVAP SML LEAK P0442/P1442" of "EVAPORATIVE SYSTEM" in "DTC WORK SUPPORT" mode with CONSULT-II.

Follow the instruction displayed.

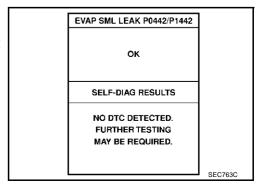


NOTE:

If the engine speed cannot be maintained within the range displayed on the CONSULT-II screen, go to $\underline{\text{EC-86}}$, "Basic Inspection".

Make sure that "OK" is displayed.
 If "NG" is displayed, select "SELF-DIAG RESULTS" mode and make sure that "EVAP GROSS LEAK [P0455]" is displayed. If it is displayed, refer to EC-395, "Diagnostic Procedure"

If P0442 is displayed, perform "Diagnostic Procedure" for DTC P0442 EC-356, "Diagnostic Procedure".



DTC P0455 EVAP CONTROL SYSTEM

[TYPE 1]

® WITH GST

NOTE:

Be sure to read the explanation of "Driving Pattern" on EC-67 before driving vehicle.

- Start engine.
- Drive vehicle according to "Driving Pattern", EC-67.
- 3. Stop vehicle.
- 4. Select "MODE 1" with GST.
 - If SRT of EVAP system is not set yet, go to the following step.
 - If SRT of EVAP system is set, the result will be OK.
- Turn ignition switch "OFF" and wait at least 10 seconds.
- Start engine.

It is not necessary to cool engine down before driving.

- 7. Drive vehicle again according to the "Driving Pattern", EC-67.
- 8. Stop vehicle.
- 9. Select "MODE 3" with GST.
 - If P0455 is displayed on the screen, go to EC-395, "Diagnostic Procedure".
 - If P0442 is displayed on the screen, go to "Diagnostic Procedure", for DTC P0442, EC-356.
 - If P0441 is displayed on the screen, go to "Diagnostic Procedure" for DTC P0441, EC-350.
 - If P0455, P0441, P0442 are not displayed on the screen, go to the following step.
- 10. Select "MODE 1" with GST.
 - If SRT of EVAP system is set, the result will be OK.
 - If SRT of EVAP system is not set, go to step 6.

Diagnostic Procedure

1. CHECK FUEL FILLER CAP DESIGN

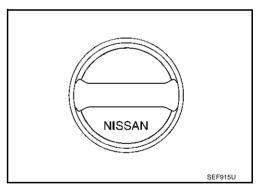
Turn ignition switch "OFF".

2. Check for genuine NISSAN fuel filler cap design.

OK or NG

OK >> GO TO 2.

NG >> 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.

OK or NG

NG

OK >> GO TO 3.

>> 1. Open fuel filler cap, then clean cap and fuel filler neck threads using air blower.

2. Retighten until ratcheting sound is heard.

3. CHECK FUEL FILLER CAP FUNCTION

Check for air releasing sound while opening the fuel filler cap.

OK or NG

OK >> GO TO 5.

NG >> GO TO 4. EC

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[TYPE 1]

4. CHECK FUEL TANK VACUUM RELIEF VALVE

Refer to EC-638, "FUEL TANK VACUUM RELIEF VALVE (BUILT INTO FUEL FULLER CAP)".

OK or NG

OK >> GO TO 5.

NG >> 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-636, "EVAPORATIVE EMISSION LINE DRAWING".

OK or NG

OK >> GO TO 6.

NG >> 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-639, "Removal and Installation".
- EVAP canister vent control valve.
 Refer to <u>EC-374</u>, "Component Inspection".

OK or NG

OK >> GO TO 8.

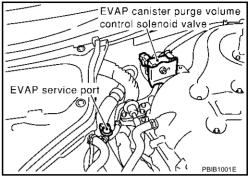
NG >> Repair or replace EVAP canister vent control valve and O-ring.

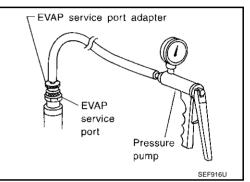
8. INSTALL THE PRESSURE PUMP

To locate the EVAP leak, install EVAP service port adapter and pressure pump to EVAP service port securely.

NOTE:

Improper installation of the EVAP service port adapter to the EVAP service port may cause leaking.





Models with CONSULT-II>>GO TO 9. Models without CONSULT-II>>GO TO 10.

9. CHECK FOR EVAP LEAK

(P) With CONSULT-II

- 1. Turn ignition switch "ON".
- 2. Select "EVAP SYSTEM CLOSE" of "WORK SUPPORT" mode with CONSULT-II.
- 3. Touch "START" and apply pressure into the EVAP line until the pressure indicator reaches the middle of the bar graph.

NOTE:

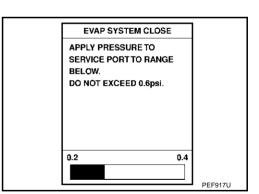
- Never use compressed air or a high pressure pump.
- Do not exceed 4.12 kPa (0.042 kg/cm², 0.6 psi) of pressure in the system.

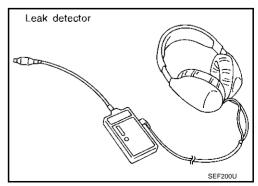
 Using EVAP leak detector, locate the EVAP leak. For the leak detector, refer to the instruction manual for more details. Refer to EC-636, "EVAPORATIVE EMISSION LINE DRAWING"

OK or NG

OK >> GO TO 11.

NG >> Repair or replace.





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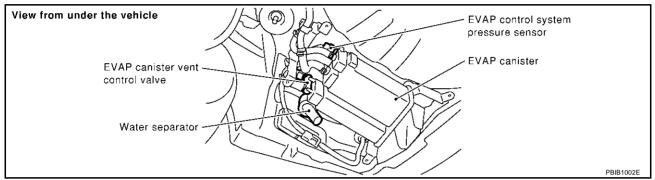
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10. CHECK FOR EVAP LEAK

(R) Without CONSULT-II

- 1. Turn ignition switch "OFF".
- 2. Apply 12 volts DC to EVAP canister vent control valve. The valve will close. (Continue to apply 12 volts until the end of test.)



3. Pressurize the EVAP line using pressure pump with 1.3 to 2.7 kPa (10 to 20 mmHg, 0.39 to 0.79 inHg), then remove pump and EVAP service port adapter.

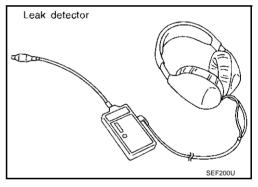
NOTE:

- Never use compressed air or a high pressure pump.
- Do not exceed 4.12 kPa (0.042 kg/cm², 0.6 psi) of pressure in the system.
- 4. Using EVAP leak detector, locate the EVAP leak. For the leak detector, refer to the instruction manual for more details. Refer to EC-636, "EVAPORATIVE EMISSION LINE DRAWING".

OK or NG

OK >> GO TO 12.

NG >> Repair or replace.



11. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

(P) With CONSULT-II

- 1. Disconnect vacuum hose to EVAP canister purge volume control solenoid valve at EVAP service port.
- 2. Start engine.
- Perform "PURG VOL CONT/V" in "ACTIVE TEST" mode.
- Touch "Qu" on CONSULT-II screen to increase "PURG VOL CONT/V" opening to 100%.
- 5. Check vacuum hose for vacuum when revving engine up to 2,000 rpm.

OK or NG

OK >> GO TO 14.

NG >> GO TO 13.

ACTIVE TEST		
PURG VOL CONT/V	XXX %	
MONITOR		
ENG SPEED	XXX rpm	
A/F ALPHA-B1	XX %	
HO2S1 MNTR (B1)	LEAN	
		PBIB082

DTC P0455 EVAP CONTROL SYSTEM

[TYPE 1]

12. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

(R) Without CONSULT-II

- Start engine and warm it up to normal operating temperature.
- 2. Stop engine.
- Disconnect vacuum hose to EVAP canister purge volume control solenoid valve at EVAP service port.
- 4. Start engine and let it idle for at least 80 seconds.
- Check vacuum hose for vacuum when revving engine up to 2,000 rpm.

Vacuum should exist.

OK or NG

OK >> GO TO 15. NG >> GO TO 13.

13. CHECK VACUUM HOSE

Check vacuum hoses for clogging or disconnection. Refer to EC-31, "Vacuum Hose Drawing".

OK or NG

OK (With CONSULT-II)>>GO TO 14.

OK (Without CONSULT-II)>>GO TO 15.

>> Repair or reconnect the hose.

14. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

(P) With CONSULT-II

- 1. Start engine.
- 2. Perform "PURG VOL CONT/V" in "ACTIVE TEST" mode with CONSULT-II. Check that engine speed varies according to the valve opening.

OK or NG

OK >> GO TO 16. NG >> GO TO 15.

ACTIVE TES	Т	
PURG VOL CONT/V	PURG VOL CONT/V XXX %	
MONITOR	MONITOR	
ENG SPEED	XXX rpm	
A/F ALPHA-B1	XX %	
HO2S1 MNTR (B1)	LEAN	
	1	

15. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-368, "Component Inspection".

OK or NG

OK >> GO TO 16.

NG >> Replace EVAP canister purge volume control solenoid valve.

16. CHECK FUEL TANK TEMPERATURE SENSOR

Refer to EC-285, "Component Inspection".

OK or NG

OK >> GO TO 17.

NG >> Replace fuel level sensor unit.

EC-399 Revision; 2004 April 2003 G35 Sedan

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17. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-384, "Component Inspection".

OK or NG

OK >> GO TO 18.

NG >> Replace EVAP control system pressure sensor.

18. CHECK EVAP/ORVR LINE

Check EVAP/ORVR line between EVAP canister and fuel tank for clogging, kink, looseness and improper connection. For location, refer to $\underline{\text{EC-642}}$, "ON BOARD REFUELING VAPOR RECOVERY (ORVR)".

OK or NG

OK >> GO TO 19.

NG >> Repair or replace hoses and tubes.

19. CHECK RECIRCULATION LINE

Check recirculation line between filler neck tube and fuel tank for clogging, kink, cracks, looseness and improper connection.

OK or NG

OK >> GO TO 20.

NG >> Repair or replace hose, tube or filler neck tube.

20. CHECK REFUELING EVAP VAPOR CUT VALVE

Refer to EC-646, "REFUELING EVAP VAPOR CUT VALVE".

OK or NG

OK >> GO TO 21.

NG >> Replace refueling EVAP vapor cut valve with fuel tank.

21. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

[TYPE 1]

DTC P0456 EVAP CONTROL SYSTEM

PFP:14950

On Board Diagnosis Logic

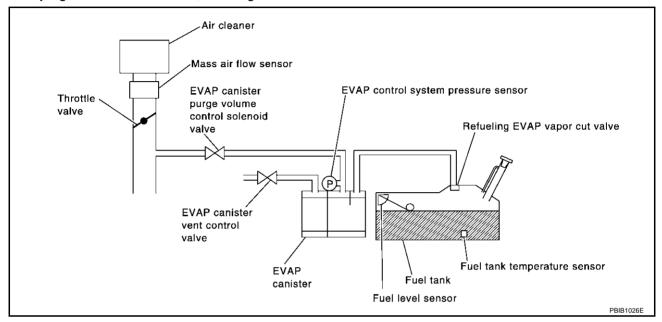
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This diagnosis detects very small leaks in the EVAP line between fuel tank and EVAP canister purge volume control solenoid valve, using the intake manifold vacuum in the same way as conventional EVAP small leak diagnosis.

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 there are no leaks, the diagnosis will be OK.



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DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
			Incorrect fuel tank vacuum relief valve
			Incorrect fuel filler cap used
			Fuel filler cap remains open or fails to 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
	Evaporativo omission	 EVAP system has a very small leak. EVAP system does not operate properly. EVAP canister vent control valve and valve and the circuit Fuel tank temperature sensor O-ring of EVAP canister vent control 	Blocked or bent rubber tube to EVAP control system pressure sensor
P0456	control system very		Loose or disconnected rubber tube
0456	small leak (negative		EVAP canister vent control valve and the circuit
	pressure check)		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
			Water separator
			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 vol- ume 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 come on.
- If the fuel filler cap is not tightened properly, the MIL may come on.
- Use only a genuine NISSAN rubber tube as a replacement.

DTC Confirmation Procedure

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NOTE:

- If DTC P0456 is displayed with P0442, first perform trouble diagnosis for DTC P0456.
- After repair, make sure that the hoses and clips are installed properly.
- If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

- Open engine hood before conducting 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.
- Refilled or drained the fuel.
- EVAP component parts is/are removed.
- Before performing the following procedure, confirm that battery voltage is more than 11V at idle.

DTC P0456 EVAP CONTROL SYSTEM

[TYPE 1]

(A) WITH CONSULT-II

- 1. Turn ignition switch "ON" and select "DATA MONITOR" mode with CONSULT-II.
- Make sure the following conditions are met.

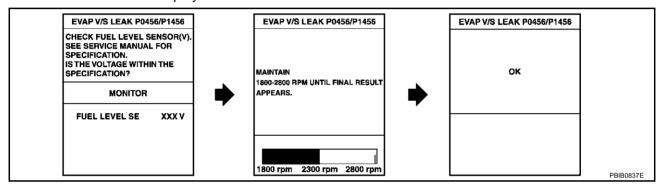
FUEL LEVEL SE: 0.25 - 1.4V

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 refilling/draining 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).

- 3. Turn ignition switch "OFF" and wait at least 10 seconds.
- Turn ignition switch "ON".
- 5. Select "EVAP V/S LEAK P0456/P1456" of "EVAPORATIVE SYSTEM" in "DTC WORK SUPPORT" mode with CONSULT-II.

Follow the instruction displayed.



Make sure that "OK" is displayed.
 If "NG" is displayed, refer to EC-404, "Diagnostic Procedure".

NOTE:

- If the engine speed cannot be maintained within the range displayed on CONSULT-II screen, go to EC-86, "Basic Inspection".
- Make sure that EVAP hoses are connected to EVAP canister purge volume control solenoid valve properly.

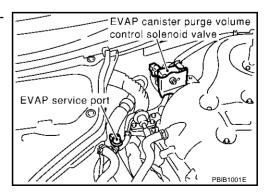
Overall Function Check

WITH GST

Use this procedure to check the overall function of the EVAP very small leak function. During this check, a DTC might not be confirmed.

CAUTION:

- Never use compressed air, doing so may damage the EVAP system.
- Do not start engine.
- Do not exceeded 4.12 kPa (0.042 kg/cm², 0.6 psi).
- Attach the EVAP service port adapter securely to the EVAP service port.



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Adapter for EVAP service port

EVAP

service port

Pressure pump

- 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 mode 8.
- Using mode 8 control the EVAP canister vent control valve (close).
- Apply pressure and make sure the following conditions are satisfied

Pressure to be applied: 2.7 kPa (20 mmHg, 0.79 inHg) 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 (3 mmHg, 0.12 inHg).

If NG, go to EC-404, "Diagnostic Procedure".

If OK, go to next step.

- 8. Disconnect GST.
- 9. Start engine and warm it up to normal operating temperature.
- 10. Turn ignition switch "OFF" and wait at least 10 seconds.
- 11. Restart engine and let it idle for 90 seconds.
- 12. Keep engine speed at 2,000 rpm for 30 seconds.
- 13. Turn ignition switch "OFF".

NOTE:

For more information, refer to GST instruction manual.

Diagnostic Procedure

1. CHECK FUEL FILLER CAP DESIGN

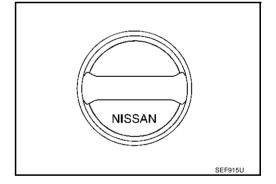
ABS000BE

- 1. Turn ignition switch "OFF".
- 2. Check for genuine NISSAN fuel filler cap design.

OK or NG

OK >> GO TO 2.

NG >> 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.

OK or NG

OK >> GO TO 3.

NG >> 1. Open fuel filler cap, then clean cap and fuel filler neck threads using air blower.

2. Retighten until ratcheting sound is heard.

3. CHECK FUEL FILLER CAP FUNCTION

Check for air releasing sound while opening the fuel filler cap.

OK or NG

OK >> GO TO 5.

NG >> GO TO 4.

4. CHECK FUEL TANK VACUUM RELIEF VALVE

Refer to EC-638, "FUEL TANK VACUUM RELIEF VALVE (BUILT INTO FUEL FULLER CAP)".

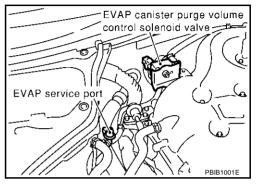
OK or NG

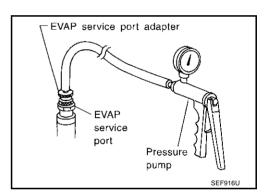
OK >> GO TO 5.

NG >> Replace fuel filler cap with a genuine one.

5. INSTALL THE PRESSURE PUMP

To locate the EVAP leak, install EVAP service port adapter and pressure pump to EVAP service port securely. For the location of EVAP service port, refer to EC-636, "EVAPORATIVE EMISSION LINE DRAWING".





NOTE:

Improper installation of the EVAP service port adapter to the EVAP service port may cause leaking.

Models with CONSULT-II>>GO TO 6. Models without CONSULT-II>>GO TO 7.

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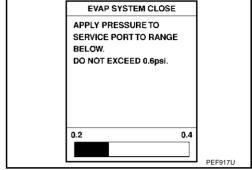
6. CHECK FOR EVAP LEAK

(II) With CONSULT-II

- 1. Turn ignition switch "ON".
- 2. Select "EVAP SYSTEM CLOSE" of "WORK SUPPORT" mode with CONSULT-II.
- 3. Touch "START" and apply pressure into the EVAP line until the pressure indicator reaches the middle of the bar graph.

NOTE:

- Never use compressed air or a high pressure pump.
- Do not exceed 4.12 kPa (0.042 kg/cm², 0.6 psi) of pressure in the system.



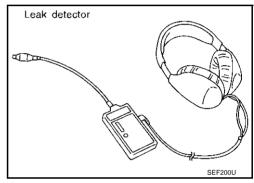
4. Using EVAP leak detector, locate the EVAP leak. For the leak detector, refer to the instruction manual for more details.

Refer to EC-636, "EVAPORATIVE EMISSION LINE DRAWING"

OK or NG

OK >> GO TO 8.

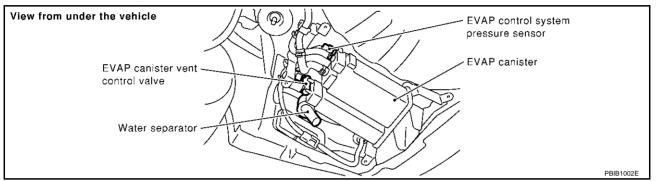
NG >> Repair or replace.



7. CHECK FOR EVAP LEAK

W Without CONSULT-II

- 1. Turn ignition switch "OFF".
- 2. Apply 12 volts DC to EVAP canister vent control valve. The valve will close. (Continue to apply 12 volts until the end of test.)



3. Pressurize the EVAP line using pressure pump with 1.3 to 2.7 kPa (10 to 20 mmHg, 0.39 to 0.79 inHg), then remove pump and EVAP service port adapter.

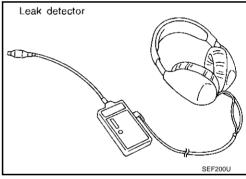
NOTE:

- Never use compressed air or a high pressure pump.
- Do not exceed 4.12 kPa (0.042 kg/cm², 0.6 psi) of pressure in the system.
- 4. Using EVAP leak detector, locate the EVAP leak. For the leak detector, refer to the instruction manual for more details. Refer to EC-636, "EVAPORATIVE EMISSION LINE DRAWING".

OK or NG

OK >> GO TO 8.

NG >> Repair or replace.



8. CHECK WATER SEPARATOR

Refer to EC-410, "Component Inspection".

OK or NG

OK >> GO TO 9.

NG >> Replace water separator.

9. CHECK EVAP CANISTER VENT CONTROL VALVE

Check the following.

- EVAP canister vent control valve is installed properly.
 Refer to <u>EC-639</u>, "<u>Removal and Installation</u>".
- EVAP canister vent control valve.
 Refer to <u>EC-374</u>, "Component Inspection".

OK or NG

OK >> GO TO 10.

NG >> Repair or replace EVAP canister vent control valve and O-ring.

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2003 G35 Sedan

10. CHECK IF EVAP CANISTER SATURATED WITH WATER

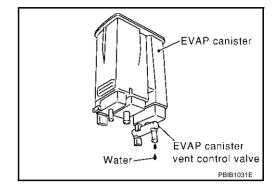
- Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
- 2. Does water drain from the EVAP canister?

Yes or No

Yes >> GO TO 11.

No (With CONSULT-II)>>GO TO 13.

No (Without CONSULT-II)>>GO TO 14.



ACTIVE TEST

0 %

PURG VOL CONT/V

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).

OK or NG

OK (With CONSULT-II)>>GO TO 13.

OK (Without CONSULT-II)>>GO TO 14.

NG >> GO TO 12.

12. DETECT MALFUNCTIONING PART

Check the following.

- EVAP canister for damage
- EVAP hose between EVAP canister and water separator for clogging or poor connection

>> Repair hose or replace EVAP canister.

13. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

(P) With CONSULT-II

- 1. Disconnect vacuum hose to EVAP canister purge volume control solenoid valve at EVAP service port.
- 2. Start engine.
- 3. Perform "PURG VOL CONT/V" in "ACTIVE TEST" mode.
- 4. Touch "Qu" on CONSULT-II screen to increase "PURG VOL CONT/V" opening to 100%.
- 5. Check vacuum hose for vacuum when revving engine up to 2,000 rpm.

OK or NG

OK >> GO TO 16. NG >> GO TO 15.

uum when revving engine up to	ENG SPEED	XXX rpm
5 5 .	HO2S1 MNTR (B1)	LEAN
	HO2S1 MNTR (B2)	LEAN
	A/F ALPHA-B1	XXX %
	A/F ALPHA-B2	XXX %

DTC P0456 EVAP CONTROL SYSTEM

[TYPE 1]

14. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

(R) Without CONSULT-II

- Start engine and warm it up to normal operating temperature.
- 2. Stop engine.
- Disconnect vacuum hose to EVAP canister purge volume control solenoid valve at EVAP service port.
- Start engine and let it idle for at least 80 seconds.
- Check vacuum hose for vacuum when revving engine up to 2,000 rpm.

Vacuum should exist.

OK or NG

OK >> GO TO 16. NG >> GO TO 15.

15. CHECK VACUUM HOSE

Check vacuum hoses for clogging or disconnection. Refer to EC-31, "Vacuum Hose Drawing".

OK or NG

>> GO TO 16. OK

NG >> Repair or reconnect the hose.

16. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-368. "Component Inspection".

OK or NG

OK >> GO TO 17.

NG >> Replace EVAP canister purge volume control solenoid valve.

17. CHECK FUEL TANK TEMPERATURE SENSOR

Refer to EC-285, "Component Inspection".

OK or NG

OK >> GO TO 18.

NG >> Replace fuel level sensor unit.

18. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-384, "Component Inspection".

OK or NG

OK >> GO TO 19.

NG >> Replace EVAP control system pressure sensor.

19. check evap purge line

Check EVAP purge line (pipe, rubber tube, fuel tank and EVAP canister) for cracks or improper connection. Refer to EC-636, "EVAPORATIVE EMISSION LINE DRAWING".

OK or NG

OK >> GO TO 20.

NG >> Repair or reconnect the hose.

20. CLEAN EVAP PURGE LINE

Clean EVAP purge line (pipe and rubber tube) using air blower.

>> GO TO 21.

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$\overline{2}1$. CHECK EVAP/ORVR LINE

Check EVAP/ORVR line between EVAP canister and fuel tank for clogging, kink, looseness and improper connection. For location, refer to EC-642, "ON BOARD REFUELING VAPOR RECOVERY (ORVR)".

OK or NG

OK >> GO TO 22.

NG >> Repair or replace hoses and tubes.

22. CHECK RECIRCULATION LINE

Check recirculation line between filler neck tube and fuel tank for clogging, kink, cracks, looseness and improper connection.

OK or NG

OK >> GO TO 23.

NG >> Repair or replace hose, tube or filler neck tube.

23. CHECK REFUELING EVAP VAPOR CUT VALVE

Refer to EC-645, "Component Inspection".

OK or NG

OK >> GO TO 24.

NG >> Replace refueling EVAP vapor cut valve with fuel tank.

24. CHECK FUEL LEVEL SENSOR

Refer to DI-21, "FUEL LEVEL SENSOR UNIT CHECK".

OK or NG

OK >> GO TO 25.

NG >> Replace fuel level sensor unit.

25. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

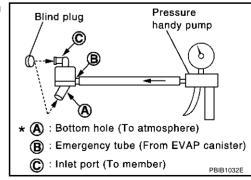
Component Inspection WATER SEPARATOR

ABS000BF

- 1. Check visually for insect nests in the water separator air inlet.
- 2. Check visually for cracks or flaws in the appearance.
- Check visually for cracks or flaws in the hose.
- 4. Check that **A** and **C** are not clogged by blowing air into **B** with **A**, and then **C** plugged.
- 5. In case of NG in items 2 4, replace the parts.

NOTE:

Do not disassemble water separator.



[TYPE 1]

DTC P0460 FUEL LEVEL SENSOR

PFP:25060

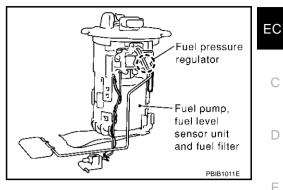
Component Description

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Α

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

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.



On Board Diagnosis Logic

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When the vehicle is parked, naturally the fuel level in the fuel tank is 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 0460	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 sensor circuit is open or shorted)Fuel level sensor

DTC Confirmation Procedure

ABS000B

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

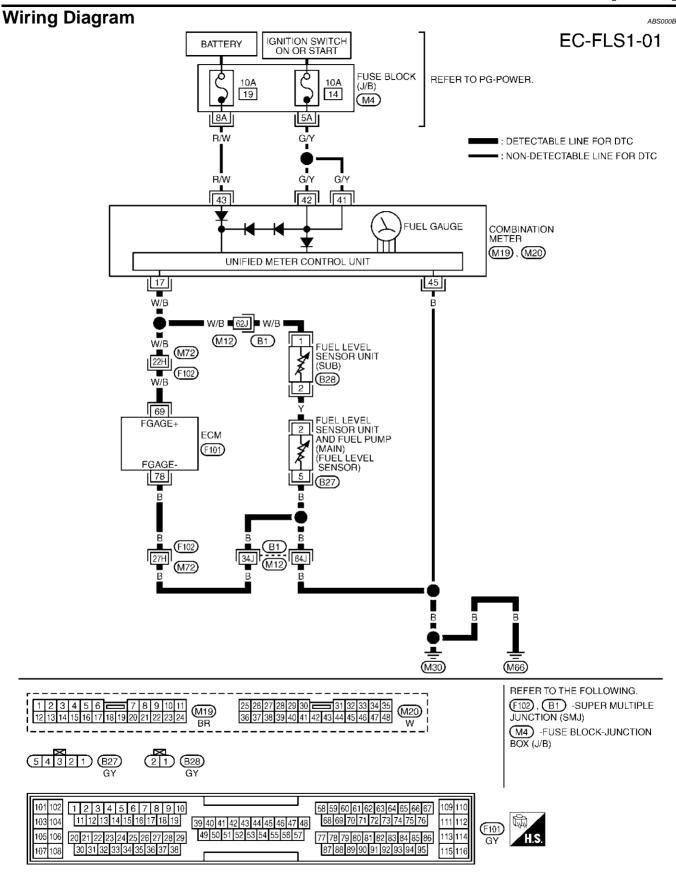
(A) WITH CONSULT-II

- Turn ignition switch "ON". 1.
- Select "DATA MONITOR" mode with CONSULT-II.
- Start engine and wait maximum of 2 consecutive minutes.
- If 1st trip DTC is detected, go to EC-413, "Diagnostic Procedure"

DATA MON	IITOR	
MONITOR	NO DTC	
FUELT/TMP SE	XXX °C	
FUEL LEVEL SE	XXX V	

WITH GST

Follow the procedure "WITH CONSULT-II" above.



TBWT0161E

DTC P0460 FUEL LEVEL SENSOR

[TYPE 1]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
69	W/B	Fuel level sensor	[Ignition switch "ON"]	Approximately 0 - 4.8V Output voltage varies with fuel level.
78	В	Fuel level sensor ground	[Engine is running] • Idle speed	Approximately 0V

Diagnostic Procedure

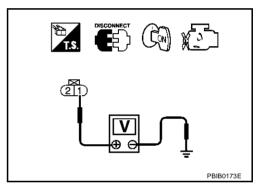
1. CHECK FUEL LEVEL SENSOR POWER SUPPLY CIRCUIT

- Turn ignition switch "OFF". 1.
- 2. Disconnect fuel level sensor unit (sub) harness connector.
- Turn ignition switch "ON".
- Check voltage between fuel level sensor unit (sub) terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 3. NG >> GO TO 2.



2. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M12, B1
- Harness for open or short between combination meter and fuel level sensor until (sub)
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK FUEL LEVEL SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

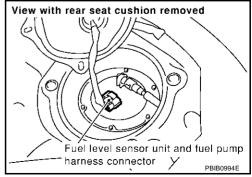
- 1. Turn ignition switch "OFF".
- Disconnect fuel level sensor unit (main) harness connector.
- Check harness continuity between fuel level sensor unit (main) terminal 5 and body ground. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to power.

OK or NG

OK >> GO TO 5. NG >> GO TO 4.



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4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M12, B1
- Harness for open or short between ECM and fuel level sensor until and fuel pump
 - >> Repair open circuit or short to power in harness or connectors.

5. CHECK FUEL LEVEL SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Disconnect ECM harness connector.
- Check harness continuity between ECM terminal 69 and fuel level sensor unit (sub) terminal 1, ECM terminal 78 and fuel level sensor unit (main) terminal 5.
 Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to ground or short to power.

OK or NG

OK >> GO TO 7. NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M12, B1
- Harness connectors M72, F102
- Harness for open or short between ECM and fuel level sensor unit (main)
- Harness for open or short between ECM and fuel level sensor unit (sub)
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK HARNESS CONTINUITY BETWEEN FUL LEVEL SENSOR UNIT (SUB) AND FUEL LEVEL SENSOR UNIT (MAIN)

- 1. Turn ignition switch "OFF".
- Check harness continuity between fuel level sensor unit (sub) terminal 2 and fuel level sensor unit (main) terminal 2.

Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 7.

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

8. CHECK FUEL LEVEL SENSOR

Check the following.

- Fuel level sensor unit (sub). Refer to <u>DI-21</u>, "<u>Electrical Components Inspection</u>".
- Fuel level sensor unit (main). Refer to <u>DI-21, "Electrical Components Inspection"</u>.

OK or NG

OK >> GO TO 9.

NG >> Replace malfunctioning component.

DTC P0460 FUEL LEVEL SENSOR

[TYPE 1]

9. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

Removal and Installation FUEL LEVEL SENSOR

Refer to FL-5, "FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY" .

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DTC P0461 FUEL LEVEL SENSOR

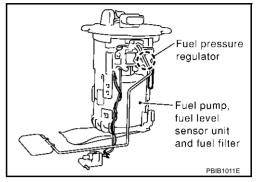
PFP:25060

Component Description

ABS000JC

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 ECM.

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.



On Board Diagnosis Logic

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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 0461	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 sensor circuit is open or shorted) Fuel level sensor

Overall Function Check

ABS000JE

Use this procedure to check the overall function of the fuel level sensor function. During this check, a 1st trip DTC might not be confirmed.

WARNING:

When performing following procedure, be sure to observe the handling of the fuel. Refer to <u>FL-12</u>. <u>"FUEL TANK"</u>.

TESTING CONDITION:

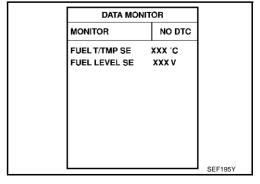
Before starting overall function check, preparation of draining fuel and refilling fuel is required.

(WITH CONSULT-II

NOTE:

Start from step 11, if it is possible to confirm that the fuel cannot be drained by 30 $\,\ell$ (7-7/8 US gal, 6-5/8 lmp gal) in advance.

- 1. Prepare a fuel container and a spare hose.
- 2. Release fuel pressure from fuel line, refer to EC-53, "FUEL PRESSURE RELEASE".
- Remove the fuel feed hose on the fuel level sensor unit.
- 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-II.
- 7. Check "FUEL LEVEL SE" output voltage and note it.
- 8. Select "FUEL PUMP" in "ACTIVE TEST" mode with CONSULT-
- 9. Touch "ON" and drain fuel approximately 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal) and stop it.
- 10. Fill fuel into the fuel tank for 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal).
- 11. Check "FUEL LEVEL SE" output voltage and note it.
- 12. Check "FUEL LEVEL SE" output voltage and confirm whether the voltage changes more than 0.03V during step 7 to 11. If NG, check the fuel level sensor, refer to <u>DI-21</u>, "FUEL LEVEL <u>SENSOR UNIT CHECK"</u>.

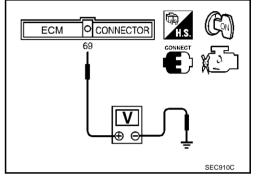


® WITH GST

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.
- 2. Release fuel pressure from fuel line. Refer to EC-53, "FUEL PRESSURE RELEASE".
- Remove the fuel feed hose on the fuel level sensor unit.
- 4. Connect a spare fuel hose where the fuel feed hose was removed.
- Turn ignition switch "OFF".
- 6. Set voltmeters probe between ECM terminal 69 (fuel level sensor signal) and ground.
- 7. Turn ignition switch "ON".
- Check voltage between ECM terminal 69 and ground and note it.
- 9. Drain fuel by 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal) from the fuel tank using proper equipment.
- 10. Fill fuel into the fuel tank for 30 $\,\ell\,$ (7-7/8 US gal, 6-5/8 Imp gal).
- Confirm that the voltage between ECM terminal 69 and ground changes more than 0.03V during step 8 10.
 If NG, check component of fuel level sensor, refer to <u>DI-21</u>, "FUEL LEVEL SENSOR UNIT CHECK".



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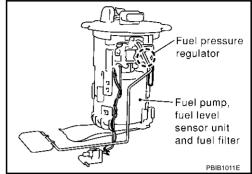
DTC P0462, P0463 FUEL LEVEL SENSOR

Component Description

PFP:25060

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

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.



On Board Diagnosis Logic

ARSOORN

ECM receives two signals from the fuel level sensor circuit.

One is fuel level sensor power supply circuit, and the other is fuel level sensor ground circuit.

This diagnosis indicates the former, to detect open or short circuit malfunction.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0462 0462	Fuel level sensor circuit low input	An excessively low voltage is sent from the sensor is sent to ECM.	Harness or connectors (The sensor circuit is open or shorted)
P0463 0463	Fuel level sensor circuit high input	An excessively high voltage is sent from the sensor is sent to ECM.	Fuel level sensor

DTC Confirmation Procedure

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NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

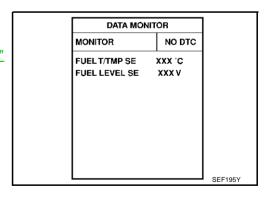
TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 11V at ignition switch "ON".

(II) WITH CONSULT-II

- 1. Turn ignition switch "ON".
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- 3. Wait at least 5 seconds.
- If 1st trip DTC is detected, go to <u>EC-420, "Diagnostic Procedure"</u>

.

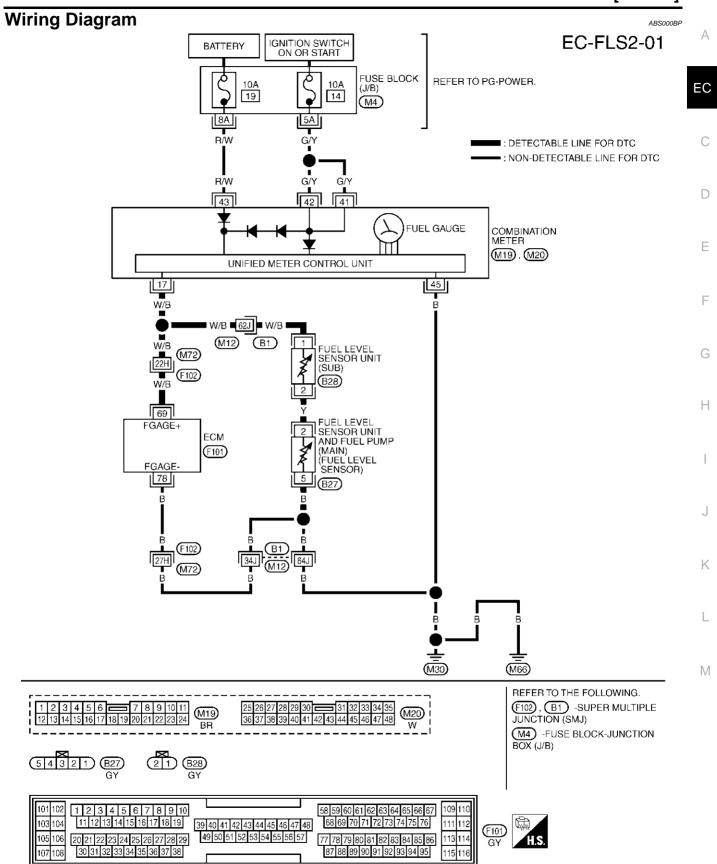


WITH GST

Follow the procedure "WITH CONSULT-II" above.

DTC P0462, P0463 FUEL LEVEL SENSOR

[TYPE 1]



TBWT0162E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
69	W/B	Fuel level sensor	[Ignition switch "ON"]	Approximately 0 - 4.8V Output voltage varies with fuel level.
78	В	Fuel level sensor ground	[Engine is running] ● Idle speed	Approximately 0V

Diagnostic Procedure

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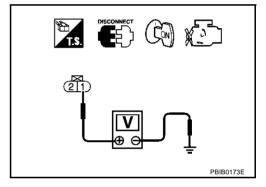
1. CHECK FUEL LEVEL SENSOR POWER SUPPLY CIRCUIT

- 1. Turn ignition switch "OFF".
- 2. Disconnect fuel level sensor unit (sub) harness connector.
- 3. Turn ignition switch "ON".
- 4. Check voltage between fuel level sensor unit (sub) terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 3. NG >> GO TO 2.



2. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M12, B1
- Harness for open or short between combination meter and fuel level sensor until (sub)
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK FUEL LEVEL SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

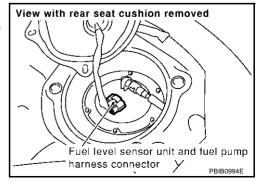
- 1. Turn ignition switch "OFF".
- 2. Disconnect fuel level sensor unit (main) harness connector.
- Check harness continuity between fuel level sensor unit (main) terminal 5 and body ground. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to power.

OK or NG

OK >> GO TO 5. NG >> GO TO 4.



DTC P0462, P0463 FUEL LEVEL SENSOR

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4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M12, B1
- Harness for open or short between ECM and fuel level sensor until (main)
 - >> Repair open circuit or short to power in harness or connectors.

${f 5}$. CHECK FUEL LEVEL SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Disconnect ECM harness connector.
- Check harness continuity between ECM terminal 69 and fuel level sensor unit (sub) terminal 1. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to ground or short to power.

OK or NG

OK >> GO TO 7. NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M12, B1
- Harness connectors M72, F102
- Harness for open or short between ECM and fuel level sensor unit (sub)
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

1. CHECK HARNESS CONTINTY BETWEEN FUL LEVEL SENSOR UNIT (SUB) AND FULE LEVEL SEN-**SOR UNIT (MAIN)**

- Turn ignition switch "OFF".
- Check harness continuity between fuel level sensor unit (sub) terminal 2 and fuel level sensor unit (main) terminal 2.

Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 7.

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

8. CHECK FUEL LEVEL SENSOR

Check the following.

- Fuel level sensor unit (sub). Refer to DI-21, "Electrical Components Inspection".
- Fuel level sensor unit (main). Refer to DI-21, "Electrical Components Inspection".

OK or NG

OK >> GO TO 8.

NG >> Replace malfunctioning component.

EC-421 Revision; 2004 April 2003 G35 Sedan

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DTC P0462, P0463 FUEL LEVEL SENSOR

[TYPE 1]

9. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

Removal and Installation FUEL LEVEL SENSOR

ABS000BR

Refer to FL-5, "FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY".

[TYPE 1]

DTC P0500 VSS PFP:32702

Description ARSONORS

NOTE:

If DTC P0500 is displayed with DTC U1000 or U1001, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-142, "DTC U1000, U1001 CAN COMMUNICATION LINE".

The vehicle speed signal is sent to the combination meter from the VDC/TCS/ABS control unit by CAN communication line. The combination meter then sends the signal to the ECM by CAN communication line.

On Board Diagnosis Logic

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DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
			Harness or connectors (The CAN communication line is open or shorted)
P0500 0500	Vehicle speed sensor	The almost 0 km/h (0 MPH) signal from vehicle speed sensor is sent to ECM even when vehicle is being driven.	 Harness or connectors (The vehicle speed signal circuit is open or shorted)
			Wheel sensor
			Combination meter
		VDC/TCS/ABS control unit	

DTC Confirmation Procedure

ABS000BU

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Steps 1 and 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.

(A) WITH CONSULT-II

- Start engine (VDC switch "OFF").
- Read "VHCL SPEED SE" in "DATA MONITOR" mode with CONSULT-II. The vehicle speed on CONSULT-II should exceed 10 km/h (6 MPH) when rotating wheels with suitable gear position. If NG, go to EC-424, "Diagnostic Procedure".

If OK, go to following step.

- Select "DATA MONITOR" mode with CONSULT-II.
- Warm engine up to normal operating temperature.
- Maintain the following conditions for at least 50 consecutive seconds.

ENG SPEED	1,700 - 6,000 rpm
COOLAN TEMP/S	More than 70°C (158°F)
B/FUEL SCHDL	5.5 - 31.8 msec
Selector lever	Except "P" or "N" position
PW/ST SIGNAL	OFF

6. If 1st trip DTC is detected, go to EC-424, "Diagnostic Procedure"

DATA MONITOR		
MONITOR	NO DTC	
ENG SPEED	XXX rpm	
COOLAN TEMP/S	XXX °C	
B/FUEL SCHDL	XXX msec	
PW/ST SIGNAL	OFF	
VHCL SPEED SE	XXX km/h	

Overall Function Check

ARSONORV

Use this procedure to check the overall function of the vehicle speed sensor circuit. During this check, a 1st trip DTC might not be confirmed.

WITH GST

1. Lift up drive wheels.

EC-423 Revision; 2004 April 2003 G35 Sedan

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- 2. Start engine.
- 3. Read vehicle speed sensor signal in "MODE 1" with GST.
 The vehicle speed sensor on GST should be able to exceed 10 km/h (6 MPH) when rotating wheels with suitable gear position.
- 4. If NG, go to EC-424, "Diagnostic Procedure".

Diagnostic Procedure

ABS000BW

1. CHECK DTC WITH VDC/TCS ABS CONTROL UNIT

Refer to BRC-13, "TROUBLE DIAGNOSIS".

OK or NG

OK >> GO TO 2.

NG >> Repair or replace.

2. CHECK COMBINATION METER

Check combination meter function.

Refer to DI-4, "COMBINATION METERS".

>> INSPECTION END

DTC P0506 ISC SYSTEM

[TYPE 1]

DTC P0506 ISC SYSTEM

PFP:23781

Description

ABSOORX

NOTE:

If DTC P0506 is displayed with other DTC, first perform the trouble diagnosis for the other DTC.

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 (POS) 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.).

On Board Diagnosis Logic

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DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0506 0506	Idle speed control sys- tem 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 leak

DTC Confirmation Procedure

ABS000BZ

NOTE:

- If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.
- If the target idle speed is out of the specified value, perform "Idle Air Volume Learning", <u>EC-51</u>, before conducting "DTC Confirmation Procedure". For the target idle speed, refer to the "Service Data and Specifications (SDS)", <u>EC-653</u>.

TESTING CONDITION:

- Before performing the following procedure, confirm that battery voltage is more than 11V at idle.
- Always perform the test at a temperature above –10°C (14°F).

WITH CONSULT-II

- Open engine hood.
- 2. Start engine and warm it up to normal operating temperature.
- Turn ignition switch "OFF" and wait at least 10 seconds.
- 4. Turn ignition switch "ON" again and select "DATA MONITOR" mode with CONSULT-II.
- Start engine and run it for at least 1 minute at idle speed.
- If 1st trip DTC is detected, go to EC-426, "Diagnostic Procedure"

DATA MONITOR

MONITOR

NO DTC

ENG SPEED XXX rpm
COOLAN TEMP/S XXX °C

® WITH GST

Follow the procedure "WITH CONSULT-II" above.

Revision; 2004 April EC-425 2003 G35 Sedan

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DTC P0506 ISC SYSTEM

[TYPE 1]

Diagnostic Procedure

1. CHECK INTAKE AIR LEAK

ABS000C0

- 1. Start engine and let it idle.
- 2. Listen for an intake air leak after the mass air flow sensor.

OK or NG

OK >> GO TO 2.

NG >> Discover air leak location and repair.

2. REPLACE ECM

- 1. Stop engine.
- 2. Replace ECM.
- 3. Perform initialization of NATS system and registration of all NATS ignition key IDs. Refer to <u>BL-127, "ECM Re-communicating Function"</u>.
- 4. Perform EC-51, "Accelerator Pedal Released Position Learning".
- 5. Perform EC-51, "Throttle Valve Closed Position Learning".
- 6. Perform EC-51, "Idle Air Volume Learning".

>> INSPECTION END

DTC P0507 ISC SYSTEM

[TYPE 1]

DTC P0507 ISC SYSTEM

PFP:23781

Description

NOTE:

If DTC P0507 is displayed with other DTC, first perform the trouble diagnosis for the other DTC.

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 (POS) 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.).

On Board Diagnosis Logic

ABS000C2

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0507 0507	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

ABS000C3

NOTE:

- If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.
- If the target idle speed is out of the specified value, perform "Idle Air Volume Learning", <u>EC-51</u>, before conducting "DTC Confirmation Procedure". For the target idle speed, refer to the "Service Data and Specifications (SDS)", <u>EC-653</u>.

TESTING CONDITION:

- Before performing the following procedure, confirm that battery voltage is more than 11V at idle.
- Always perform the test at a temperature above –10°C (14°F).

(P) WITH CONSULT-II

- 1. Open engine hood.
- Start engine and warm it up to normal operating temperature.
- 3. Turn ignition switch "OFF" and wait at least 10 seconds.
- Turn ignition switch "ON" again and select "DATA MONITOR" mode with CONSULT-II.
- 5. Start engine and run it for at least 1 minute at idle speed.
- 6. If 1st trip DTC is detected, go to EC-428, "Diagnostic Procedure"

DATA MÓN	IITOR
MONITOR	NO DTC
ENG SPEED COOLAN TEMP/S	XXX rpm XXX °C

® WITH GST

Follow the procedure "WITH CONSULT-II" above.

Revision; 2004 April EC-427 2003 G35 Sedan

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DTC P0507 ISC SYSTEM

[TYPE 1]

Diagnostic Procedure

1. CHECK PCV HOSE CONNECTION

ABS000C4

Confirm that PCV hose is connected correctly.

OK or NG

OK >> GO TO 2.

NG >> Repair or replace.

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.

OK or NG

OK >> GO TO 3.

NG >> Discover air leak location and repair.

3. REPLACE ECM

- 1. Stop engine.
- 2. Replace ECM.
- 3. Perform initialization of NATS system and registration of all NATS ignition key IDs. Refer to <u>BL-127, "ECM Re-communicating Function"</u>.
- 4. Perform EC-51, "Accelerator Pedal Released Position Learning".
- 5. Perform EC-51, "Throttle Valve Closed Position Learning".
- 6. Perform EC-51, "Idle Air Volume Learning".

>> INSPECTION END

DTC P0550 PSP SENSOR

[TYPE 1]

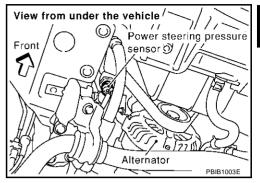
DTC P0550 PSP SENSOR

PFP:49763

Component Description

ABS000C5

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.



CONSULT-II Reference Value in Data Monitor Mode

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Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
PW/ST SIGNAL	Engine: After warming up, idle the engine	Steering wheel is in neutral position. (Forward direction)	OFF
	the engine	Steering wheel is turned.	ON

On Board Diagnosis Logic

ABS000C7

The MIL will not light up for this diagnosis.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0550 0550	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

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NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

(P) WITH CONSULT-II

- 1. Turn ignition switch "ON".
- Select "DATA MONITOR" mode with CONSULT-II.
- Start engine and let it idle for at least 5 seconds.
- If 1st trip DTC is detected, go to EC-431, "Diagnostic Procedure".

WITH GST

Follow the procedure "WITH CONSULT-II" above.

EC-429 Revision; 2004 April 2003 G35 Sedan

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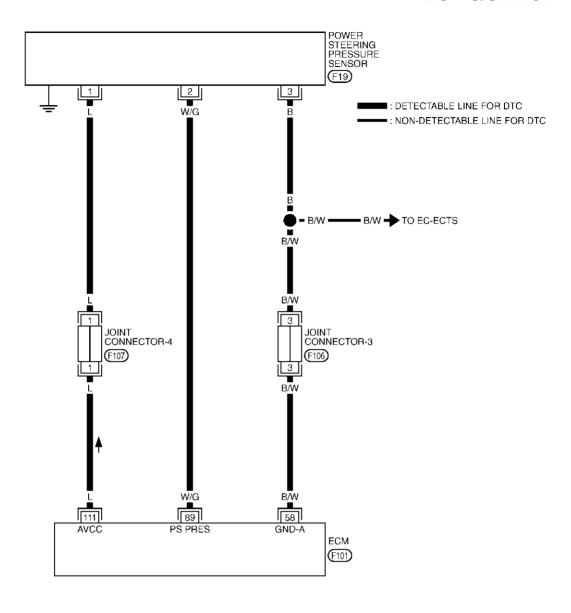
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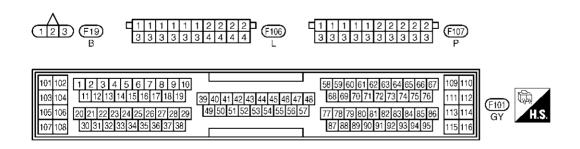
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Wiring Diagram

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EC-PS/SEN-01





TBWT0164E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

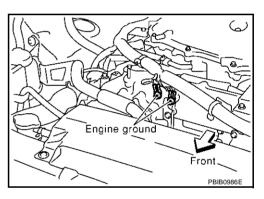
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
58	B/W	Sensors' ground	[Engine is running]Warm-up conditionIdle speed	Approximately 0V
89 W/G	W/G	Power steering pressure sensor	[Engine is running]Steering wheel is being turned.	0.5 - 4.5V
	W/G		[Engine is running]Steering wheel is not being turned.	0.4 - 0.8V
111	L	Sensors' power supply	[Ignition switch "ON"]	Approximately 5V

Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

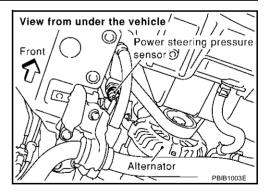
- Turn ignition switch "OFF". 1.
- Loosen and retighten engine ground screws.

>> GO TO 2.



2. CHECK PSP SENSOR POWER SUPPLY CIRCUIT

- Disconnect PSP sensor harness connector.
- Turn ignition switch "ON".

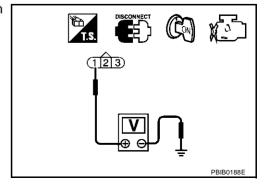


Check voltage between PSP sensor terminal 1 and ground with CONSULT-II or tester.

Voltage: Approximately 5V

OK or NG

OK >> GO TO 4. NG >> GO TO 3.



EC-431 2003 G35 Sedan Revision; 2004 April

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$\overline{3}$. detect malfunctioning part

Check the following.

- Joint connector-4
- Harness for open or short between ECM and power steering pressure sensor
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK PSP SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch "OFF".
- 2. Check harness continuity between PSP sensor terminal 3 and engine ground. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 6. NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-3
- Harness for open or short between power steering pressure sensor and ECM
 - >> Repair open circuit or short to power in harness or connectors.

6. CHECK PSP SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Disconnect ECM harness connector.
- 2. Check harness continuity between ECM terminal 89 and PSP sensor terminal 2.

Continuity should exist.

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

OK or NG

OK >> GO TO 7.

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

7. CHECK PSP SENSOR

Refer to EC-433, "Component Inspection".

OK or NG

OK >> GO TO 8.

NG >> Replace PSP sensor.

8. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

DTC P0550 PSP SENSOR

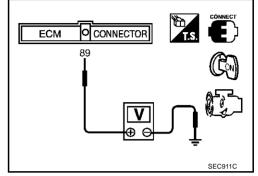
[TYPE 1]

Component Inspection
POWER STEERING PRESSURE SENSOR

ABS000CB

- 1. Reconnect all harness connectors disconnected.
- 2. Start engine and let it idle.
- 3. Check voltage between ECM terminal 89 and ground under the following conditions.

Condition	Voltage
Steering wheel is being turned.	0.5 – 4.5V
Steering wheel is not being turned.	0.4 - 0.8V



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Revision; 2004 April EC-433 2003 G35 Sedan

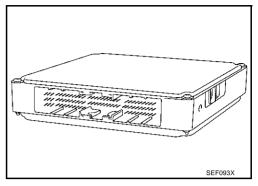
[TYPE 1]

DTC P0605 ECM PFP:23710

Component Description

ABSOOCC

The ECM consists of a microcomputer and connectors for signal input and output and for power supply. The ECM controls the engine.



On Board Diagnosis Logic

ABS000CD

This self-diagnosis has one or two trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition		Possible cause
		A)	ECM calculation function is malfunctioning.	
P0605 0605	Engine control module	B)	ECM EEP-ROM system is malfunctioning.	• ECM
		C)	ECM self shut-off function is malfunctioning.	

FAIL-SAFE MODE

ECM enters fail-safe mode when the malfunction A is detected.

Detected items	Engine operation condition in fail-safe mode	
Malfunction A	 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. 	

DTC Confirmation Procedure

ABS000CE

Perform "PROCEDURE FOR MALFUNCTION A" first. If the 1st trip DTC cannot be confirmed, perform "PROCEDURE FOR MALFUNCTION B". If there is no malfunction on "PROCEDURE FOR MALFUNCTION B", perform "PROCEDURE FOR MALFUNCTION C".

NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

PROCEDURE FOR MALFUNCTION A

(P) With CONSULT-II

- 1. Turn ignition switch "ON".
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- 3. If 1st trip DTC is detected, go to <u>EC-435, "Diagnostic Procedure"</u>

DATA MONITOR		
MONITOR	NO DTC	
ENG SPEED X	XX rpm	
		SEF058Y

⊕ With GST

Follow the procedure "With CONSULT-II" above.

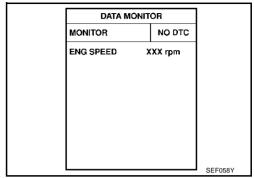
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PROCEDURE FOR MALFUNCTION B

(A) With CONSULT-II

- Turn ignition switch "ON" and wait at least 1 second.
- Select "DATA MONITOR" mode with CONSULT-II.
- Turn ignition switch "OFF", wait at least 10 seconds, and then turn "ON".
- 4. If 1st trip DTC is detected, go to EC-435, "Diagnostic Procedure"

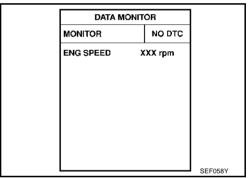


Follow the procedure "With CONSULT-II" above.

PROCEDURE FOR MALFUNCTION C

(P) With CONSULT-II

- 1. Turn ignition switch "ON" and wait at least 1 second.
- Select "DATA MONITOR" mode with CONSULT-II.
- Turn ignition switch "OFF", wait at least 10 seconds, and then 3. turn "ON".
- 4. Repeat step 3 procedure, 32 times.
- 5. If 1st trip DTC is detected, go to EC-435, "Diagnostic Procedure"



⊚ With GST

Follow the procedure "With CONSULT-II" above.

Diagnostic Procedure

1. INSPECTION START

(P) With CONSULT-II

- Turn ignition switch "ON".
- Select "SELF DIAG RESULTS" mode with CONSULT-II.
- Touch "ERASE". 3.
- 4. Perform "DTC Confirmation Procedure". See EC-434.
- 5. Is the 1st trip DTC P0605 displayed again?

With GST

- 1. Turn ignition switch "ON".
- Select MODE 4 with GST.
- 3. Touch "ERASE".
- 4. Perform "DTC Confirmation Procedure". See <u>EC-434</u>.
- 5. Is the 1st trip DTC P0605 displayed again?

Yes or No

Yes >> GO TO 2.

No >> INSPECTION END Н

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EC-435 Revision; 2004 April 2003 G35 Sedan

2. REPLACE ECM

- 1. Replace ECM.
- 2. Perform initialization of NATS system and registration of all NATS ignition key IDs. Refer to <u>BL-127, "ECM Re-communicating Function"</u>.
- 3. Perform EC-51, "Accelerator Pedal Released Position Learning" .
- 4. Perform EC-51, "Throttle Valve Closed Position Learning".
- 5. Perform EC-51, "Idle Air Volume Learning".

>> INSPECTION END

DTC P0650 MIL

[TYPE 1]

DTC P0650 MIL PFP:24810

Component Description

ABS000CG

Malfunction Indicator Lamp (MIL) is located on the instrument panel. When the ignition switch is turned ON without engine running, MIL will light up. This is a bulb check. When the engine is started, MIL should go off. If MIL remains on, the on board diagnostic system has detected an engine system malfunction.

On Board Diagnosis Logic

ABS000CH

The MIL will not light up for this diagnosis.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0650 0650	Malfunction indicator lamp (MIL) control circuit	 An excessively high voltage is sent to ECM through the MIL circuit under the condition that calls for MIL light up. An excessively low voltage is sent to ECM through the MIL circuit under the condition that calls for MIL not to light up. 	Harness or connectors (MIL circuit is open or shorted.) MIL

FAIL-SAFE MODE

ECM enters fail-safe mode when both DTC P0650 and another DTC, which calls for MIL to light up, are detected at the same time.

Detected items	Engine operating condition in fail-safe mode
MIL circuit Engine speed will not rise more than 2,500 rpm due to the fuel cut	

DTC Confirmation Procedure

ABS000CI

NOTF:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

(P) WITH CONSULT-II

- 1. Turn ignition switch "ON" and wait at least 1 second.
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- 3. Start engine and let it idle for 1 second.
- 4. If 1st trip DTC is detected, go to EC-439, "Diagnostic Procedure"

DATA MONITOR

MONITOR

NO DTC

ENG SPEED XXX rpm

SEF058Y

® WITH GST

Follow the procedure "WITH CONSULT-II" above.

Revision; 2004 April EC-437 2003 G35 Sedan

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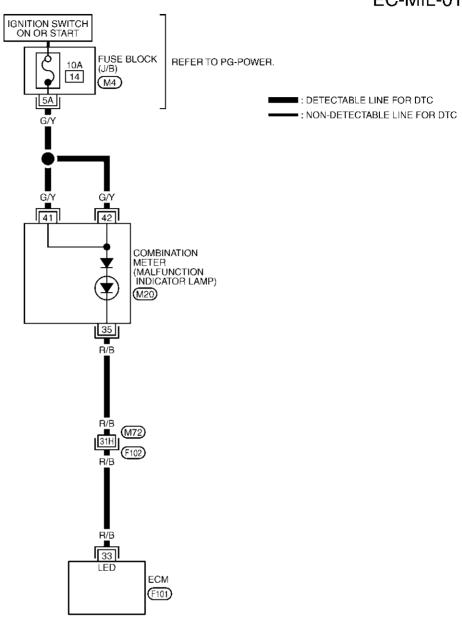
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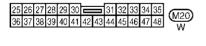
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Wiring Diagram

ABS000CJ

EC-MIL-01





REFER TO THE FOLLOWING.

(F102) -SUPER MULTIPLE
JUNCTION (SMJ)

(M4) -FUSE BLOCK-JUNCTION
BOX (J/B)

101 102



TBWT0165E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
			[Ignition switch "ON"]	0 - 1.0V
33	R/B	MIL	[Engine is running]	BATTERY VOLTAGE
			Idle speed	(11 - 14V)

Diagnostic Procedure

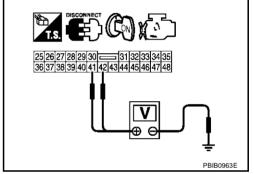
1. CHECK MIL POWER SUPPLY

- Turn ignition switch "OFF". 1.
- Disconnect combination meter harness connector. 2.
- Turn ignition switch "ON". 3.
- Check voltage between combination meter terminals 41, 42 and ground with CONSULT-II or tester

Voltage: Battery voltage

OK or NG

OK >> GO TO 3. NG >> GO TO 2.



2. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector M4
- 10A fuse
- Harness for open or short between fuse block (J/B) and combination meter
 - >> Repair harness or connectors.

3. CHECK MIL OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch "OFF". 1.
- 2. Disconnect ECM harness connector.
- Check harness continuity between ECM terminal 33 and combination meter terminal 35. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

>> GO TO 5. OK

NG >> GO TO 4. EC

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4. DETECT MALFUNCTIONING PART

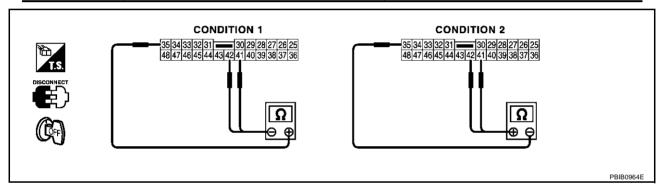
Check the following.

- Harness connectors F102, M72
- Harness for open or short between ECM and combination meter
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK COMBINATION METER

- 1. Turn ignition switch "OFF".
- 2. Disconnect combination meter harness connector.
- 3. Check continuity under the following conditions.

CONDITION	Combination meter terminal No. (Polarity)	Continuity
1	35 (+) - 41 (–)	Should exist.
·	35 (+) - 42 (–)	Gilouid exist.
2	41 (+) - 35 (–)	Should not exist.
2	42 (+) - 35 (–)	STIDUIU TIDI EXIST.



OK or NG

OK >> GO TO 6.

NG >> Replace combination meter. Refer to DI-21, "Removal and Installation for Combination Meter".

6. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

DTC P1065 ECM POWER SUPPLY

[TYPE 1]

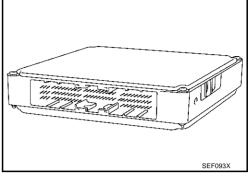
DTC P1065 ECM POWER SUPPLY

Component Description

PFP:23710

ABS000CL

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.



On Board Diagnosis Logic

ABS000CM

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1065 1065	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

ABS000CN

NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

(P) WITH CONSULT-II

- 1. Turn ignition switch "ON" and wait at least 1 second.
- Select "DATA MONITOR" mode with CONSULT-II.
- 3. Start engine and let it idle for 1 second.
- 4. Turn ignition switch "OFF", wait at least 10 seconds, and then turn "ON".
- 5. Repeat steps 3 and 4 four times.
- If 1st trip DTC is detected, go to <u>EC-443, "Diagnostic Procedure"</u>

DATA MONITOR

MONITOR NO DTC

ENG SPEED XXX rpm

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WITH GST

Follow the procedure "WITH CONSULT-II" above.

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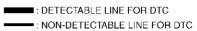
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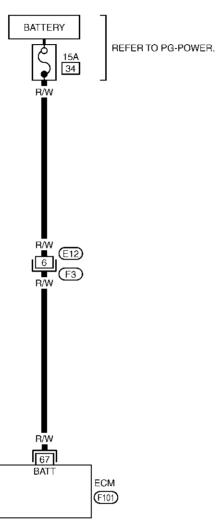
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Wiring Diagram

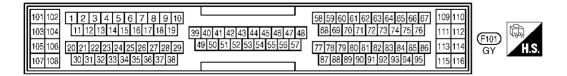
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EC-ECM/PW-01









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DTC P1065 ECM POWER SUPPLY

[TYPE 1]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
67	R/W	Power supply for ECM (Back-up)	[Ignition switch "OFF"]	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

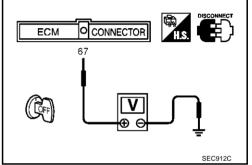
1. CHECK ECM POWER SUPPLY

- 1. Turn ignition switch "OFF".
- Disconnect ECM harness connector.
- Check voltage between ECM terminal 67 and ground with CON-SULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 3. NG >> GO TO 2.



2. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- 15A fuse
- Harness for open or short between ECM and battery
 - >> Repair or replace harness or connectors.

3. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

OK or NG

OK >> GO TO 4.

NG >> Repair or replace harness or connectors.

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2003 G35 Sedan

4. PERFORM DTC CONFIRMATION PROCEDURE

(II) With CONSULT-II

- 1. Turn ignition switch "ON".
- 2. Select "SELF DIAG RESULTS" mode with CONSULT-II.
- 3. Touch "ERASE".
- 4. Perform "DTC Confirmation Procedure". See EC-441.
- 5. Is the 1st trip DTC P1065 displayed again?

With GST

- 1. Turn ignition switch "ON".
- 2. Select MODE 4 with GST.
- 3. Touch "ERASE".
- 4. Perform "DTC Confirmation Procedure". See EC-441.
- 5. Is the 1st trip DTC P1065 displayed again?

Yes or No

Yes >> GO TO 5.

No >> INSPECTION END

5. REPLACE ECM

- 1. Replace ECM.
- 2. Perform initialization of NATS system and registration of all NATS ignition key IDs. Refer to <u>BL-127, "ECM Re-communicating Function"</u>.
- 3. Perform EC-51, "Accelerator Pedal Released Position Learning".
- 4. Perform EC-51, "Throttle Valve Closed Position Learning".
- 5. Perform EC-51, "Idle Air Volume Learning".

>> INSPECTION END

[TYPE 1]

DTC P1102 MAF SENSOR

PFP:22680

Component Description

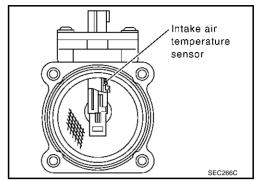
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The mass air flow sensor is placed in the stream of intake air. It measures the intake flow rate by measuring a part of the entire intake flow. It consists of a hot film that is supplied with electric current from the ECM. The temperature of the hot film is controlled by the ECM a certain amount. The heat generated by the hot film is reduced as the intake air flows around it. The more air, the greater the heat loss. Therefore, the ECM must supply more electric current to maintain the temperature of the hot film as air flow increases. The ECM detects the air flow by means of this current change.



CONSULT-II Reference Value in Data Monitor Mode

ABS000NS

Specification data are reference values.

MONITOR ITEM	C	ONDITION	SPECIFICATION
	Engine: After warming up	Idle	Approx. 1.1 - 1.5V
MAS A/F SE-B1	Air conditioner switch: OFF		
IVIAS A/F SE-DI	Shift lever: N	2,500 rpm	Approx. 1.7 - 2.4V
	No-load		
	Engine: After warming up	Idle	10% - 35%
CAL/LD VALUE	Shift lever: N		
CAL/LD VALUE	Air conditioner switch: OFF	2,500 rpm	10% - 35%
	No-load		
	Engine: After warming up	Idle	2.0 - 6.0 g·m/s
MASS AIRFLOW	Shift lever: N		
	Air conditioner switch: OFF	2,500 rpm	7.0 - 20.0 g·m/s
	No-load		

On Board Diagnosis Logic

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This self-diagnosis has the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1102 1102	Mass air flow sensor circuit range/performance problem	A voltage from the sensor is constantly approx.1.0V when engine is running.	Harness or connectors (The sensor circuit is open or shorted.)Mass air flow sensor

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters in fail-safe mode and the MIL lights up.

Detected items	Engine operating condition in fail-safe mode
Mass air flow sensor circuit	Engine speed will not rise more than 2,400 rpm due to the fuel cut.

DTC P1102 MAF SENSOR

[TYPE 1]

DTC Confirmation Procedure

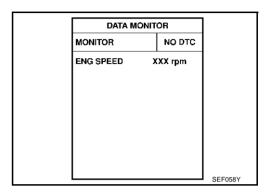
ABS000CT

NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

(P) WITH CONSULT-II

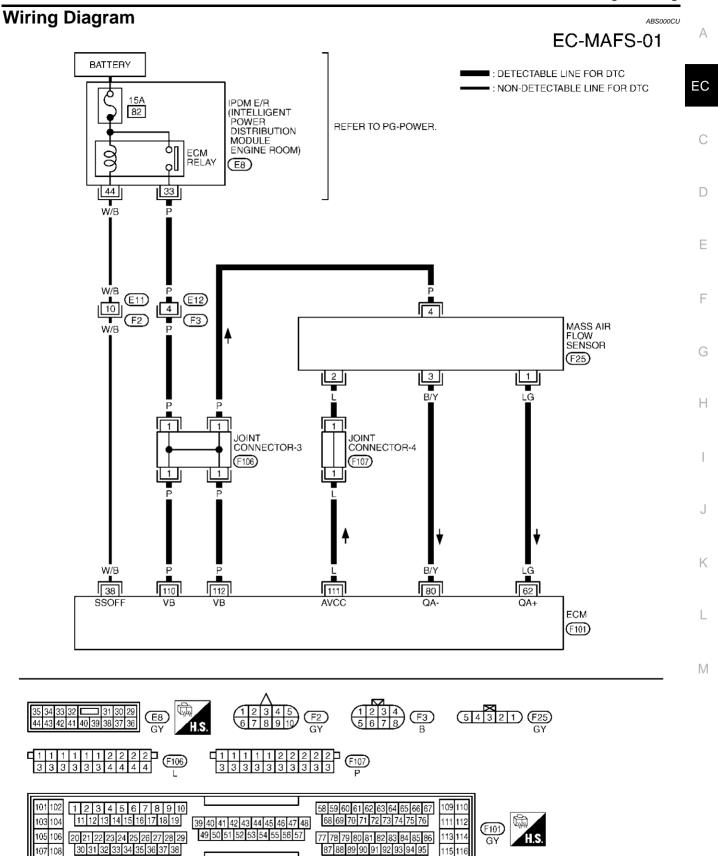
- 1. Turn ignition switch "ON".
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- 3. Start engine and wait at least 5 seconds.
- 4. If DTC is detected, go to EC-448, "Diagnostic Procedure".



WITH GST

Follow the procedure "WITH CONSULT-II" above.

[TYPE 1]



TBWT0138E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
38 W/B	W/B	ECM relay	[Engine is running] [Ignition switch "OFF"] ● For a few seconds after turning ignition switch "OFF"	0 - 1.5V
		(Self shut-off)	[Ignition switch "OFF"]A few seconds passed after turning ignition switch "OFF"	BATTERY VOLTAGE (11 - 14V)
62	LG	6 Mass air flow sensor	[Engine is running]Warm-up conditionIdle speed[Engine is running]	1.1 - 1.5V
			 Warm-up condition Engine speed is 2,500 rpm. 	1.7 - 2.4V
80	B/Y	Mass air flow sensor ground	[Engine is running] ■ Warm-up condition ■ Idle speed	Approximately 0V
110 112	P P	Power supply for ECM	[Ignition switch "ON"]	BATTERY VOLTAGE (11 - 14V)
111	L	Sensors' power supply	[Ignition switch "ON"]	Approximately 5V

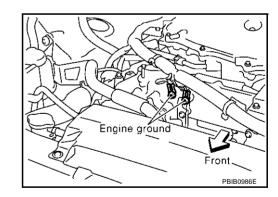
Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

ABS000CV

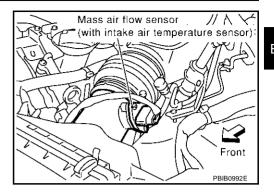
- 1. Turn ignition switch "OFF".
- 2. Loosen and retighten engine ground screws.

>> GO TO 2.



$\overline{2}$. CHECK MAF SENSOR POWER SUPPLY CIRCUIT

- Disconnect MAF sensor harness connector. 1.
- 2. Turn ignition switch "ON".



Check voltage between MAF sensor terminals 2, 4 and ground with CONSULT-II or tester.

Terminal	Voltage
2	Approximately 5V
4	Battery voltage



PBIB0076E

OK or NG

OK >> GO TO 4. NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Joint connector-4
- Joint connector-3
- Harness for open or short between mass air flow sensor and IPDM E/R
- Harness for open or short between mass air flow sensor and ECM

>> Repair harness or connectors.

4. CHECK MAF SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch "OFF".
- 2. Disconnect ECM harness connector.
- 3. Check harness continuity between MAF sensor terminal 3 and ECM terminal 80. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 5.

Revision; 2004 April

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

> EC-449 2003 G35 Sedan

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5. CHECK MAF SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

 Check harness continuity between MAF sensor terminal 1 and ECM terminal 62. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 6.

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

6. CHECK MASS AIR FLOW SENSOR

Refer to EC-450, "Component Inspection".

OK or NG

OK >> GO TO 7.

NG >> Replace mass air flow sensor.

7. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

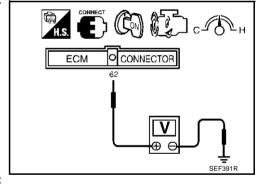
>> INSPECTION END

Component Inspection MASS AIR FLOW SENSOR

ABS000CW

- 1. Reconnect harness connectors disconnected.
- 2. Start engine and warm it up to normal operating temperature.
- Check voltage between ECM terminal 62 (Mass air flow sensor signal) and ground.

Condition	Voltage V
Ignition switch "ON" (Engine stopped.)	Approx. 1.0
Idle (Engine is warmed-up to normal operating temperature.)	1.1 - 1.5
2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.7 - 2.4
Idle to about 4,000 rpm*	1.1 - 1.5 to Approx. 4.0



^{*:} Check for liner voltage rise in response to engine being increased to about 4,000 rpm.

- 4. If the voltage is out of specification, proceed the following.
 - Turn ignition switch "OFF".
 - Disconnect mass air flow sensor harness connector and reconnect it again.
 - Perform steps 2 and 3 again.
- 5. If NG, remove mass air flow sensor from air duct. Check hot film for damage or dust.
- 6. If NG, clean or replace mass air flow sensor.

Removal and Installation MASS AIR FLOW SENSOR

ABS000CX

Refer to EM-16, "AIR CLEANER AND AIR DUCT".

DTC P1121 ELECTRIC THROTTLE CONTROL ACTUATOR

[TYPE 1]

DTC P1121 ELECTRIC THROTTLE CONTROL ACTUATOR

PFP:16119

Component Description

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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 feeds 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.

On Board Diagnosis Logic

ABS000CZ

These self-diagnoses have the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition		Possible cause
P1121	P1121 Electric throttle control	A)	Electric throttle control actuator does not function properly due to the return spring malfunction.	
1121	actuator	B)	Throttle valve opening angle in fail-safe mode is not in specified range.	Electric throttle control actuator
		C)	ECM detects the throttle valve is stuck open.	

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Detected items	Engine operating condition in fail-safe mode
Malfunction A	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.
Malfunction B	ECM controls the electric throttle control actuator by regulating the throttle opening to 20 degrees or less.
Malfunction C	While the vehicle is driving, 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.

DTC Confirmation Procedure

ABS000D0

NOTE:

- Perform "PROCEDURE FOR MALFUNCTION A AND B" first. If the 1st trip DTC cannot be confirmed, perform "PROCEDURE FOR MALFUNCTION C".
- If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

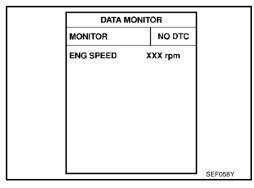
PROCEDURE FOR MALFUNCTION A AND B

(P) With CONSULT-II

- 1. Turn ignition switch "ON" and wait at least 1 second.
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- 3. Shift selector lever to "D" position and wait at least 2 seconds.
- 4. Shift selector lever to "P" position.
- 5. Turn ignition switch "OFF" and wait at least 10 seconds.
- 6. Turn ignition switch "ON" and wait at least 1 second.
- 7. Shift selector lever to "D" position and wait at least 2 seconds.
- 8. Shift selector lever to "P" position.
- 9. Turn ignition switch "OFF", wait at least 10 seconds, and then turn "ON".
- 10. If DTC is detected, go to EC-452, "Diagnostic Procedure".

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Follow the procedure "With CONSULT-II" above.



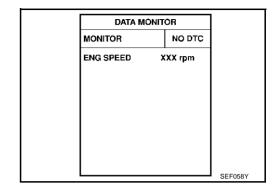
DTC P1121 ELECTRIC THROTTLE CONTROL ACTUATOR

[TYPE 1]

PROCEDURE FOR MALFUNCTION C

(iii) With CONSULT-II

- 1. Turn ignition switch "ON" and wait at least 1 second.
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- 3. Shift selector lever to "D" position and wait at least 2 seconds.
- 4. Shift selector lever to "N" or "P" position.
- 5. Start engine and let it idle for 3 seconds.
- 6. If DTC is detected, go to EC-452, "Diagnostic Procedure".



With GST

Follow the procedure "With CONSULT-II" above.

Diagnostic Procedure

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1. CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

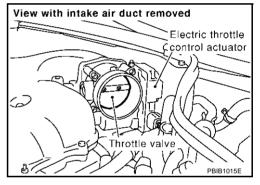
- 1. Remove the intake air duct.
- 2. Check if a foreign matter is caught between the throttle valve and the housing.

OK or NG

OK >> GO TO 2.

NG

>> Remove the foreign matter and clean the electric throttle control actuator inside.



2. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

- 1. Replace the electric throttle control actuator.
- 2. Perform EC-51, "Throttle Valve Closed Position Learning".
- 3. Perform EC-51, "Idle Air Volume Learning".

>> INSPECTION END

[TYPE 1]

DTC P1122 ELECTRIC THROTTLE CONTROL FUNCTION

PFP:16119

Description

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NOTE:

If DTC P1122 is displayed with DTC P1121 or 1126, first perform the trouble diagnosis for DTC P1121 or P1126. Refer to EC-451 or EC-460.

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 and it provides feedback to the ECM to control the throttle control motor to make the throttle valve opening angle properly in response to driving condition.

On Board Diagnosis Logic

ABS000D3

This self-diagnosis has the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1122 1122	Electric throttle control performance problem	Electric throttle control function does not operate properly.	 Harness or connectors (Throttle control motor circuit is open or shorted) Electric throttle control actuator

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Engine operating condition in fail-safe mode

ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return sprina.

DTC Confirmation Procedure

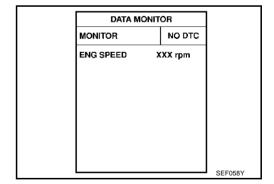
ARS000D4

NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

(A) WITH CONSULT-II

- Turn ignition switch "ON" and wait at least 2 seconds.
- Select "DATA MONITOR" mode with CONSULT-II.
- Start engine and let it idle for 5 seconds.
- If DTC is detected, go to EC-455, "Diagnostic Procedure".



WITH GST

Follow the procedure "WITH CONSULT-II" above.

EC-453 Revision; 2004 April 2003 G35 Sedan

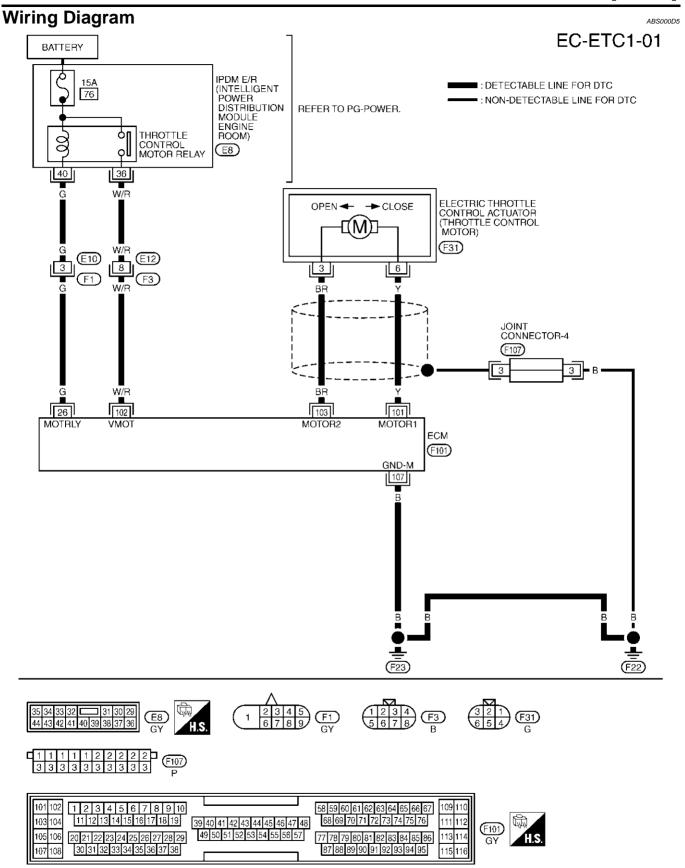
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[TYPE 1]



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[TYPE 1]

Specification data are reference values and are measured between each terminal and ground. Pulse signal is measured by CONSULT-II.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)	С
26	G	Throttle control motor relay	[Ignition switch "OFF"]	BATTERY VOLTAGE (11 - 14V)	
			[Ignition switch "ON"]	0 - 1.0V	D
101	Υ	Throttle control motor (Open)	 [Ignition switch "ON"] Engine stopped Shift lever: "D" Accelerator pedal is depressing 	0 - 14V*	E F
102	W/R	Throttle control motor relay power supply	[Ignition switch "ON"]	BATTERY VOLTAGE (11 - 14V)	G
103	BR	Throttle control motor (Close)	 [Ignition switch "ON"] Engine stopped Shift lever: "D" Accelerator pedal is releasing 	0 - 14V*	Н
107	В	Throttle control motor ground	[Ignition switch "ON"]	Approximately 0V	J

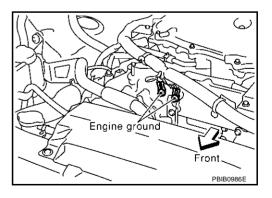
^{★:} Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

- Turn ignition switch "OFF" 1.
- Loosen and retighten engine ground screws.

>> GO TO 2.



EC

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$\overline{2}$. CHECK THROTTLE CONTROL MOTOR GROUND CIRCUIT FOR OPEN AND SHORT

- Disconnect ECM harness connector.
- Check harness continuity between ECM terminal 107 and engine ground. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to power.

OK or NG

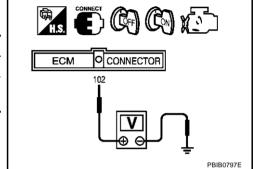
OK >> GO TO 3.

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

3. CHECK THROTTLE CONTROL MOTOR RELAY INPUT SIGNAL CIRCUIT-I

- 1. Reconnect harness connectors disconnected.
- 2. Check voltage between ECM terminal 102 and ground under the following conditions with CONSULT-II or tester.

Ignition switch	Voltage
OFF	Approximately 0V
ON	Battery voltage (11 - 14V)



OK or NG

OK >> GO TO 11. NG >> GO TO 4.

4. CHECK THROTTLE CONTROL MOTOR RELAY INPUT SIGNAL CIRCUIT-II

- 1. Turn ignition switch "OFF".
- Disconnect ECM harness connector.
- 3. Disconnect IPDM E/R harness connector E8.
- Check continuity between ECM terminal 102 and IPDM E/R terminal 36. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 6. NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12. F3
- Harness for open or short between ECM and IPDM E/R
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

[TYPE 1]

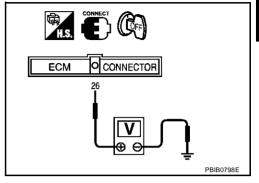
6. CHECK THROTTLE CONTROL MOTOR RELAY POWER SUPPLY CIRCUIT-I

- 1. Reconnect all harness connectors disconnected.
- Check voltage between ECM terminal 26 and ground with CON-SULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 10. NG >> GO TO 7.



7. CHECK THROTTLE CONTROL MOTOR RELAY POWER SUPPLY CIRCUIT-II

- 1. Disconnect ECM harness connector.
- Disconnect IPDM E/R harness connector E8.
- Check continuity between ECM terminal 26 and IPDM E/R terminal 40. 3. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 9. NG >> GO TO 8.

8. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E10, F1
- Harness for open or short between ECM and IPDM E/R
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

9. CHECK FUSE

- Disconnect 15A fuse.
- 2. Check 15A fuse for blown.

OK or NG

OK >> GO TO 10.

NG >> Replace 15A fuse.

10. check intermittent incident

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

OK or NG

OK >> Replace IPDM E/R. Refer to PG-16, "IPDM E/R (INTELLIGENT POWER DISTRIBUTION MOD-**ULE ENGINE ROOM)**".

NG >> Repair or replace harness or connectors. EC

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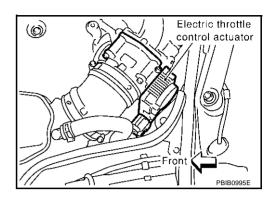
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2003 G35 Sedan

11. CHECK THROTTLE CONTROL MOTOR OUTPUT SIGNAL CIRCUIT FOR OPEN OR SHORT

- 1. Turn ignition switch "OFF".
- 2. Disconnect electric throttle control actuator harness connector.
- Disconnect ECM harness connector.
- 4. Check harness continuity between the following terminals. Refer to Wiring Diagram.

Electric throttle control actuator terminal	ECM terminal	Continuity
3	101	Should not exist
3	103	Should not exist Should exist Should exist
6	101	Should exist
O	103	Should not exist



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

OK or NG

OK >> GO TO 12.

NG >> Repair or replace.

12. CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

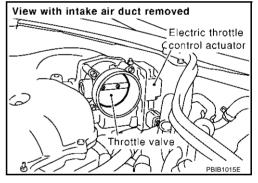
- 1. Remove the intake air duct.
- 2. Check if foreign matter is caught between the throttle valve and the housing.

OK or NG

OK >> GO TO 13.

NG >> I

>> Remove the foreign matter and clean the electric throttle control actuator inside.



13. CHECK THROTTLE CONTROL MOTOR

Refer to EC-459, "Component Inspection".

OK or NG

OK >> GO TO 14. NG >> GO TO 15.

14. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

OK or NG

OK >> GO TO 15.

NG >> Repair or replace harness or connectors.

15. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

- 1. Replace the electric throttle control actuator.
- 2. Perform EC-51, "Throttle Valve Closed Position Learning".
- 3. Perform EC-51, "Idle Air Volume Learning".

>> INSPECTION END

[TYPE 1]

Component Inspection THROTTLE CONTROL MOTOR

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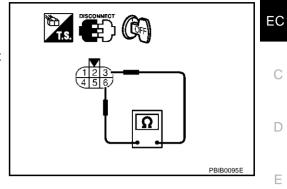
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- Disconnect electric throttle control actuator harness connector.
- Check resistance between terminals 3 and 6.

Resistance: Approximately 1 - 15 Ω [at 25 °C (77°F)]

- 3. If NG, replace electric throttle control actuator and go to next step.
- 4. Perform EC-51, "Throttle Valve Closed Position Learning".
- 5. Perform EC-51, "Idle Air Volume Learning".



ABS000D8

Remove and Installation ELECTRIC THROTTLE CONTROL ACTUATOR

Refer to EM-18, "INTAKE MANIFOLD COLLECTOR".

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[TYPE 1]

DTC P1124, P1126 THROTTLE CONTROL MOTOR RELAY

PFP:16119

Component Description

ARSONODS

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.

CONSULT-II Reference Value in Data Monitor Mode

ABS000DA

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
THRTL RELAY	• Ignition switch: ON	ON

On Board Diagnosis Logic

ABS000DB

These self-diagnoses have the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1124 1124	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
P1126 1126	Throttle control motor relay circuit open	ECM detects a voltage of power source for throttle control motor is excessively low.	Harness or connectors (Throttle control motor relay circuit is open) Throttle control motor relay

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Engine operating condition in fail-safe mode

ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.

DTC Confirmation Procedure

ABS000DC

NOTE

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

PROCEDURE FOR DTC P1124

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

(P) With CONSULT-II

- 1. Turn ignition switch "ON" and wait at least 1 second.
- Select "DATA MONITOR" mode with CONSULT-II.
- If DTC is detected, go to <u>EC-463, "Diagnostic Procedure"</u>.

DATA M	DATA MONITOR		
MONITOR	NO DTC		
ENG SPEED	XXX rpm		
	-		
		SEF058Y	

[TYPE 1]

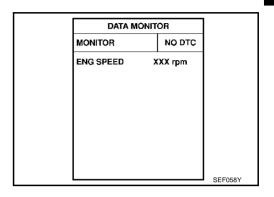
With GST

Follow the procedure "With CONSULT-II" above.

PROCEDURE FOR DTC P1126

(P) With CONSULT-II

- 1. Turn ignition switch "ON" and wait at least 2 seconds.
- 2. Select "DATA MONITOR""mode with CONSULT-II.
- 3. Start engine and let it idle for 5 seconds.
- 4. If DTC is detected, go to EC-463, "Diagnostic Procedure".



With GST

Follow the procedure "With CONSULT-II" above.

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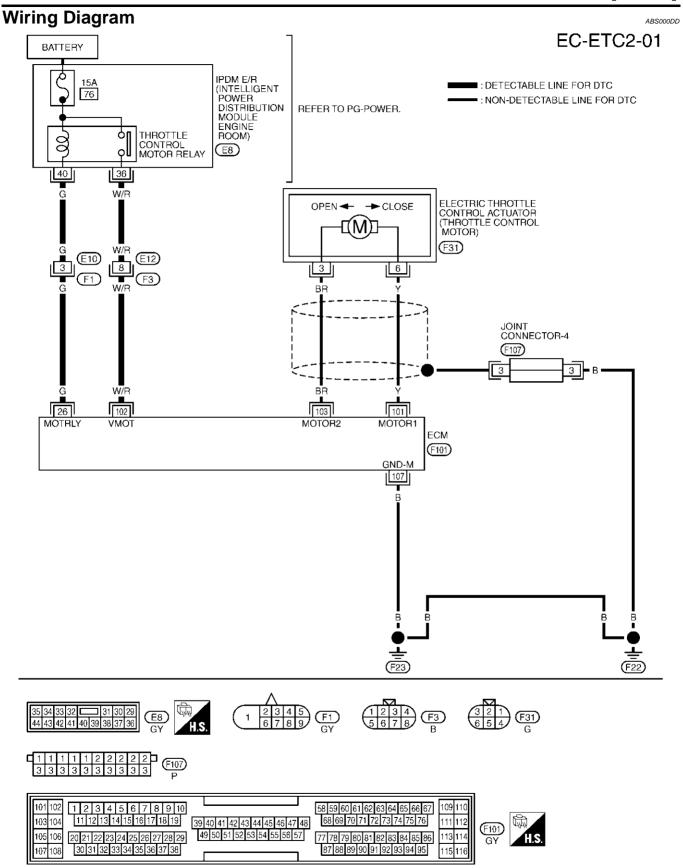
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[TYPE 1]



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[TYPE 1]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
26 G	G	Throttle control motor relay	[Ignition switch "OFF"]	BATTERY VOLTAGE (11 - 14V)
			[Ignition switch "ON"]	0 - 1.0V
102	W/R	Throttle control motor relay power supply	[Ignition switch "ON"]	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

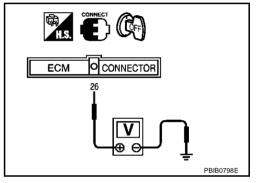
1. CHECK THROTTLE CONTROL MOTOR RELAY POWER SUPPLY CIRCUIT-I

- 1. Turn ignition switch "OFF".
- 2. Check voltage between ECM terminal 26 and ground with CON-SULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 5. NG >> GO TO 2.



2. CHECK THROTTLE CONTROL MOTOR RELAY POWER SUPPLY CIRCUIT-II

- 1. Disconnect ECM harness connector.
- 2. Disconnect IPDM E/R harness connector E8.
- Check continuity between ECM terminal 26 and IPDM E/R terminal 40. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 4. NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E10, F1
- Harness for open or short between ECM and IPDM E/R
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

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4. CHECK FUSE

- 1. Disconnect 15A fuse.
- 2. Check 15A fuse for blown.

OK or NG

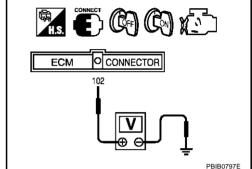
OK >> GO TO 8.

NG >> Replace 15A fuse.

5. CHECK THROTTLE CONTROL MOTOR RELAY INPUT SIGNAL CIRCUIT-I

- 1. Reconnect all harness connectors disconnected.
- 2. Check voltage between ECM terminal 102 and ground under the following conditions with CONSULT-II or tester.

Ignition switch	Voltage
OFF	Approximately 0V
ON	Battery voltage (11 - 14V)



OK or NG

OK >> GO TO 8. NG >> GO TO 6.

6. CHECK THROTTLE CONTROL MOTOR RELAY INPUT SIGNAL CIRCUIT-II

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Disconnect IPDM E/R harness connector E8.
- Check continuity between ECM terminal 102 and IPDM E/R terminal 36. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 8.

NG >> GO TO 7.

7. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Harness for open or short between ECM and IPDM E/R
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

8. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

OK or NG

OK >> Replace IPDM E/R. Refer to PG-16, "IPDM E/R (INTELLIGENT POWER DISTRIBUTION MOD-ULE ENGINE ROOM)".

NG >> Repair or replace harness or connectors.

DTC P1128 THROTTLE CONTROL MOTOR

[TYPE 1]

DTC P1128 THROTTLE CONTROL MOTOR

PFP:16119

Component Description

ABS000DF

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 and it provides feedback to the ECM to control the throttle control motor to make the throttle valve opening angle properly in response to driving condition.

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On Board Diagnosis Logic

ABS000DG

This self-diagnosis has the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1128 1128	Throttle control motor circuit short	ECM detects short in both circuits between ECM and throttle control motor.	Harness or connectors (Throttle control motor circuit is shorted.) Electric throttle control actuator (Throttle control motor)

FAIL-SAFE MODE

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When the malfunction is detected, the ECM enters fail-safe mode and the MIL lights up.

Engine operating condition in fail-safe mode

ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.

DTC Confirmation Procedure

ABS000DH

NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

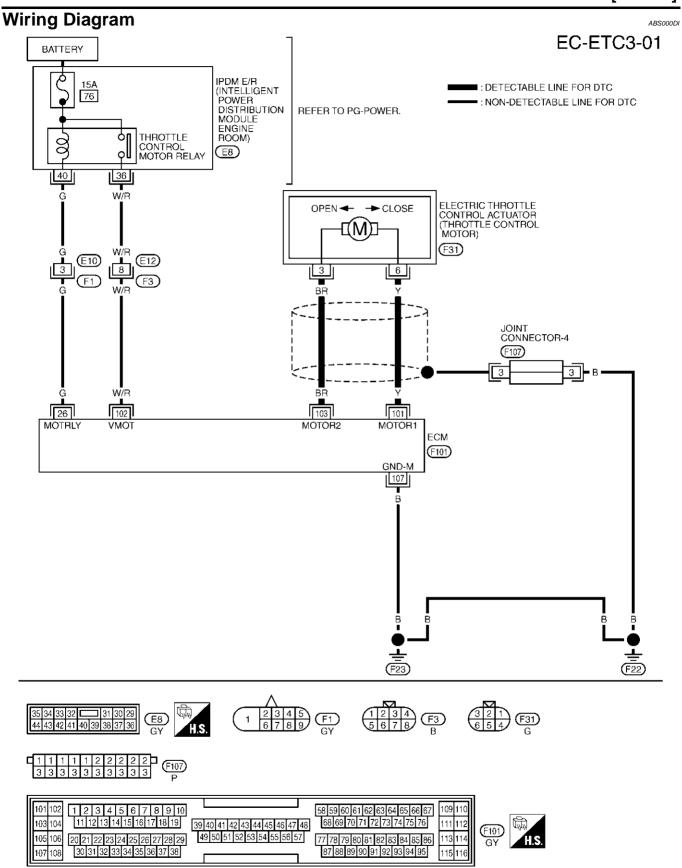
(P) WITH CONSULT-II

- 1. Turn ignition switch "ON" and wait at least 2 seconds.
- Select "DATA MONITOR" mode with CONSULT-II.
- 3. Start engine and let it idle for 5 seconds.
- If DTC is detected, go to <u>EC-467</u>, "<u>Diagnostic Procedure</u>".

DATA M	ONITOR	
MONITOR	NO DTC	
ENG SPEED	XXX rpm	1
	-	
		SEF058

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Follow the procedure "WITH CONSULT-II" above.



TBWT0169E

DTC P1128 THROTTLE CONTROL MOTOR

[TYPE 1]

Specification data are reference values and are measured between each terminal and ground. Pulse signal is measured by CONSULT-II.

CAUTION:

Do not 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.

_		_		_
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
101	Y	Throttle control motor (Open)	 [Ignition switch "ON"] Engine stopped Shift lever: "D" Accelerator pedal is depressing 	0 - 14V*
103	BR	Throttle control motor (Close)	[Ignition switch "ON"] • Engine stopped • Shift lever: "D" • Accelerator pedal is releasing	0 - 14V*

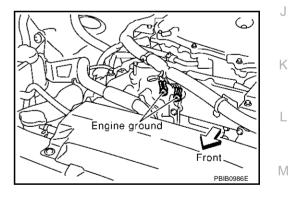
^{★:} Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

- Turn ignition switch "OFF".
- 2. Loosen and retighten engine ground screws.

>> GO TO 2.



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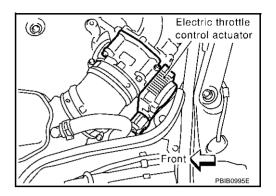
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EC-467 2003 G35 Sedan Revision; 2004 April

$\overline{2}$. 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.
- 4. Check harness continuity between the following terminals. Refer to Wiring Diagram.

Electric throttle control actuator terminal	ECM terminal	Continuity
3	101	Should not exist
3	103	Should exist
6	101	Should exist
O	103	Should not exist



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

OK or NG

OK >> GO TO 3.

NG >> Repair or replace.

3. CHECK THROTTLE CONTROL MOTOR

Refer to EC-468, "Component Inspection".

OK or NG

OK >> GO TO 4. NG >> GO TO 5.

4. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

OK or NG

OK >> GO TO 5.

NG >> Repair or replace harness or connectors.

5. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

- 1. Replace the electric throttle control actuator.
- 2. Perform EC-51, "Throttle Valve Closed Position Learning".
- 3. Perform EC-51, "Idle Air Volume Learning".

>> INSPECTION END

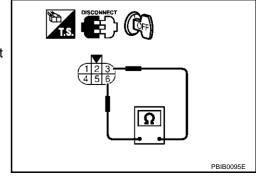
Component Inspection THROTTLE CONTROL MOTOR

ABS000DK

- Disconnect electric throttle control actuator harness connector.
- Check resistance between terminals 3 and 6.

Resistance: Approximately 1 - 15 Ω [at 25 °C (77°F)]

- 3. If NG, replace electric throttle control actuator and go to next step.
- 4. Perform EC-51, "Throttle Valve Closed Position Learning".
- Perform EC-51, "Idle Air Volume Learning".



DTC P1128 THROTTLE CONTROL MOTOR

[TYPE 1]

Removal and Installation ELECTRIC THROTTLE CONTROL ACTUATOR

Refer to EM-18, "INTAKE MANIFOLD COLLECTOR".

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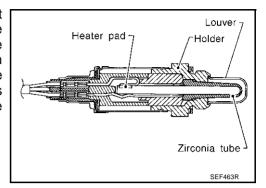
DTC P1143, P1163 HO2S1

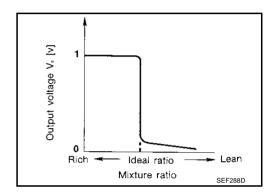
PFP:22690

Component Description

ABS000DM

The heated oxygen sensor 1 is placed into the exhaust manifold. It detects the amount of oxygen in the exhaust gas compared to the outside air. The heated oxygen sensor 1 has a closed-end tube made of ceramic zirconia. The zirconia generates voltage from approximately 1V in richer conditions to 0V in leaner conditions. The heated oxygen sensor 1 signal is sent to the ECM. The ECM adjusts the injection pulse duration to achieve the ideal air-fuel ratio. The ideal air-fuel ratio occurs near the radical change from 1 to 0V.





CONSULT-II Reference Value in Data Monitor Mode

ABS000NZ

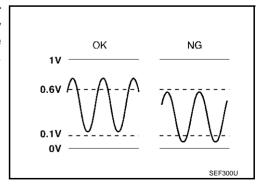
Specification data are reference values.

MONITOR ITEM	CON	SPECIFICATION	
HO2S1 (B1) HO2S1 (B2)	• Engine: After warming up Maintaining engine speed at 2,000 rpm		0 - 0.3V ←→ Approx. 0.6 - 1.0V
HO2S1 MNTR (B1) HO2S1 MNTR (B2)	Engine: After warming up	Maintaining engine speed at 2,000 rpm	LEAN ←→ RICH Changes more than 5 times during 10 seconds.

On Board Diagnosis Logic

ABS000DO

To judge the malfunction, the output from the heated oxygen sensor 1 is monitored to determine whether the "rich" output is sufficiently high and whether the "lean" output is sufficiently low. When both the outputs are shifting to the lean side, the malfunction will be detected.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1143			Heated oxygen sensor 1
1143 (Bank 1)	Heated average concer	sensor are not reached to the specified voltages.	Heated oxygen sensor 1 heater
P1163	Heated oxygen sensor 1 lean shift monitoring		Fuel pressure
1163	Troum or me morning		Injectors
(Bank 2)			Intake air leaks

DTC Confirmation Procedure

ABS000DF

CAUTION:

Always drive vehicle at a safe speed.

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

- Always perform at a temperature above -10°C (14°F).
- Before performing following procedure, confirm that battery voltage is more than 11V at idle.

(P) WITH CONSULT-II

- Start engine and warm it up to normal operating temperature.
- 2. Stop engine and wait at least 10 seconds.
- Turn ignition switch "ON" and select "HO2S1 (B1) P1143" of "HO2S1" or "HO2S1 (B2) P1163" of "HO2S1" in "DTC WORK SUPPORT" mode with CONSULT-II.
- Touch "START".
- 5. Start engine and let it idle for at least 3 minutes.

NOTE:

Never raise engine speed above 3,600 rpm after this step. If the engine speed limit is exceeded, return to step 5.

HO2\$1 (B1) P1	143	
OUT OF CONDI		
MONITOR		
ENG SPEED		
B/FUEL SCHDL	XXX msec	
COOLAN TEMP/S		
VHCL SPEED SEN		
•		PBIB0546E

When the following conditions are met, "TESTING" will be displayed on the CONSULT-II screen. Maintain the conditions continuously until "TESTING" changes to "COMPLETED". (It will take approximately 40 seconds or more.)

ENG SPEED	1,200 - 2,600 rpm
Vehicle speed	Less than 100 km/h (62 MPH)
B/FUEL SCHDL	2.5 - 12.0 msec
Selector lever	Suitable position

If "TESTING" is not displayed after 5 minutes, retry from step 2.

7. Make sure that "OK" is displayed after touching "SELF-DIAG RESULTS". If "NG" is displayed, refer to EC-472, "Diagnostic Procedure".

HQ2\$1 (B1) P1		
TESTING		
MONITOR		
ENG SPEED	XXX rpm	
B/FUEL SCHDL	XXX msec	
COOLAN TEMP/S	xxx °c	
VHCL SPEED SEN	XXX km/h	DDID0547E
		PBIB0547E

HO2S1 (B1) P1143	
COMPLETED	
	SEC769C

Overall Function Check

Use this procedure to check the overall function of the heated oxygen sensor 1 circuit. During this check, a DTC might not be confirmed.

EC-471 Revision; 2004 April 2003 G35 Sedan

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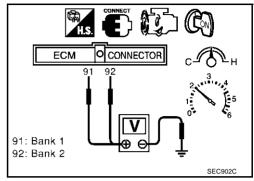
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- 1. Start engine and warm it up to normal operating temperature.
- 2. Set voltmeter probes between ECM terminal 91 [HO2S1(B1) signal] or 92 [HO2S1(B2) signal] and engine ground.
- 3. Check one of the following with engine speed held at 2,000 rpm constant under no load.
- The maximum voltage is over 0.6V at least one time.
- The minimum voltage is over 0.1V at least one time.
- 4. If NG, go to EC-472, "Diagnostic Procedure".



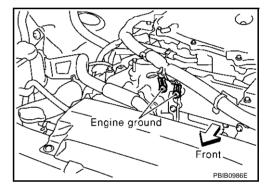
ABS000DR

Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

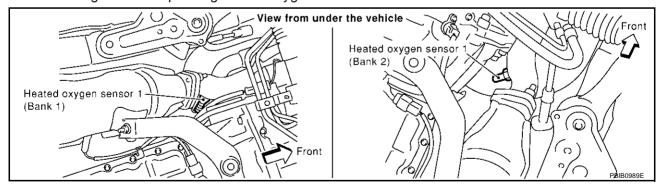
- 1. Turn ignition switch "OFF".
- 2. Loosen and retighten engine ground screws.

>> GO TO 2.



2. RETIGHTEN HEATED OXYGEN SENSOR 1

Loosen and retighten corresponding heated oxygen sensor 1.



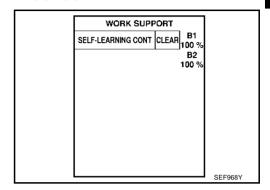
Tightening torque: 40 - 50 N·m (4.1 - 5.1 kg-m, 30 - 37 ft-lb)

>> GO TO 3.

$\overline{3}$. CLEAR THE SELF-LEARNING DATA

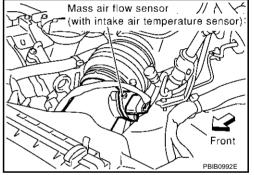
(P) With CONSULT-II

- Start engine and warm it up to normal operating temperature.
- Select "SELF-LEARNING CONT" in "WORK SUPPORT" mode with CONSULT-II.
- Clear the self-learning control coefficient by touching "CLEAR".
- 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?



Without CONSULT-II

- Start engine and warm it up to normal operating temperature.
- Turn ignition switch "OFF".
- Disconnect mass air flow sensor harness connector, and restart and run engine for at least 5 seconds at idle speed.
- Stop engine and reconnect mass air flow sensor harness connector.
- 5. Make sure DTC P0102 is displayed.
- 6. Erase the DTC memory. Refer to EC-69, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION".
- Make sure DTC P0000 is displayed.
- 8. 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 or No

Yes >> Perform trouble diagnosis for DTC P0171, P0174. Refer to EC-264.

No >> GO TO 4.

4. CHECK HEATED OXYGEN SENSOR 1 HEATER

Refer to EC-161, "Component Inspection".

OK or NG

OK >> GO TO 5.

NG >> Replace malfunctioning heated oxygen sensor 1.

5. CHECK HEATED OXYGEN SENSOR 1

Refer to EC-474, "Component Inspection".

OK or NG

OK >> GO TO 6.

NG >> Replace malfunctioning heated oxygen sensor 1.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT". For circuit, refer to EC-214, "Wiring Diagram".

>> INSPECTION END

EC-473 Revision; 2004 April 2003 G35 Sedan

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Component Inspection HEATED OXYGEN SENSOR 1

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(P) With CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- Select "MANU TRIG" and adjust "TRIGGER POINT" to 100% in "DATA MONITOR" mode with CONSULT-II.
- 3. Select "HO2S1 (B1)/(B2)" and "HO2S1 MNTR (B1)/(B2)".
- 4. Hold engine speed at 2,000 rpm under no load during the following steps.
- 5. Touch "RECORD" on CONSULT-II screen.

DATA MON	IITOR
MONITOR	NO DTC
ENG SPEED	XXX rpm
MAS A/F SE-B1	xxx v
COOLAN TEMP/S	XXX .C
HO2S1 (B1)	XXX V
HO2S1 MNTR (B1)	LEAN

- 6. Check the following.
 - "HO2S1 MNTR (B1)/(B2)" in "DATA MONITOR" mode changes from "RICH" to "LEAN" to "RICH" 5 times in 10 seconds.
 - 5 times (cycles) are counted as shown at right.
 - "HO2S1 (B1)/(B2)" voltage goes above 0.6V at least once.
 - "HO2S1 (B1)/(B2)" voltage goes below 0.3V at least once.
 - "HO2S1 (B1)/(B2)" voltage never exceeds 1.0V.

Trigger	ENG SPEED	HO2S1 (B1)	128		Ma: ●.	ximum	1	,	·	ſ.	`.	\(\alpha\)		Maximum voltage should be over 0.6V
1 2/2/2	rpm	V		/	, ,	-I	Ì	- /	j	- 1	,	-1	!	at least one time.
XXX	XXX	XXX	l											
XXX	XXX	XXX	l			- 1	•	•		r	1	•		
XXX	XXX	XXX	l .											
XXX	XXX	XXX	5-	. ·	- 1	2	- 1	1	- 1	•	•			
XXX	XXX	XXX	1 "									_		 Minimum voltage
XXX	XXX	XXX	1	i (i	- !	i	- 1	i	- 1	1		Į.	should be below 0.30V
XXX	XXX	XXX	1	1 1	1	i	1	i	. !	i	1	i	1	at least one time.
XXX	XXX	XXX	1	V = I	1	1	1	!	١.		i i	1	i	
XXX	XXX	XXX	1	i /	ì	- [į	- 1	, i	- /	1	- /	Ņ	
XXX	XXX	XXX	1	W	,	Ú.	1		٠,	e i	'	, i	`_	
XXX	XXX	XXX	1							[™] Mini	mum	1		
XXX	XXX	XXX	1 _											
			0	•										SEF648Y

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 tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.

(R) Without CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- 2. Set voltmeter probes between ECM terminal 91 [HO2S1 (B1) signal] or 92 [HO2S1 (B2) signal] and engine ground.
- Check the following with engine speed held at 2,000 rpm constant under no load.
 - The voltage fluctuates between 0 to 0.3V and 0.6 to 1.0V more than 5 times within 10 seconds.
 - The maximum voltage is over 0.6V at least one time.
 - The minimum voltage is below 0.3V at least one time.
 - The voltage never exceeds 1.0V.

1 time: $0 - 0.3V \rightarrow 0.6 - 1.0V \rightarrow 0 - 0.3V$

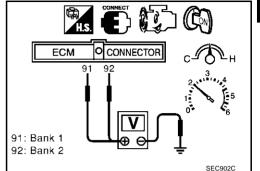
2 times: 0 - 0.3V \rightarrow 0.6 - 1.0V \rightarrow 0 - 0.3V \rightarrow 0.6 - 1.0V

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 tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.

Removal and Installation HEATED OXYGEN SENSOR 1

Refer to EM-24, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .



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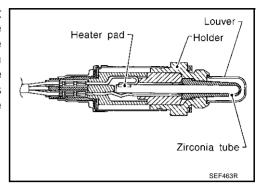
DTC P1144, P1164 HO2S1

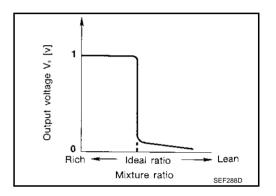
PFP:22690

Component Description

ABS000DU

The heated oxygen sensor 1 is placed into the exhaust manifold. It detects the amount of oxygen in the exhaust gas compared to the outside air. The heated oxygen sensor 1 has a closed-end tube made of ceramic zirconia. The zirconia generates voltage from approximately 1V in richer conditions to 0V in leaner conditions. The heated oxygen sensor 1 signal is sent to the ECM. The ECM adjusts the injection pulse duration to achieve the ideal air-fuel ratio. The ideal air-fuel ratio occurs near the radical change from 1 to 0V.





CONSULT-II Reference Value in Data Monitor Mode

ABS000NY

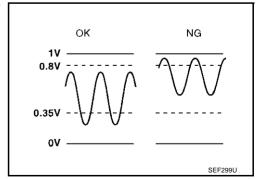
Specification data are reference values.

MONITOR ITEM	CON	SPECIFICATION	
HO2S1 (B1) HO2S1 (B2)	Engine: After warming up	e: After warming up Maintaining engine speed at 2,000 rpm	
HO2S1 MNTR (B1) HO2S1 MNTR (B2)	Engine: After warming up	Maintaining engine speed at 2,000 rpm	LEAN ←→ RICH Changes more than 5 times during 10 seconds.

On Board Diagnosis Logic

ABS000DW

To judge the malfunction, the output from the heated oxygen sensor 1 is monitored to determine whether the "rich" output is sufficiently high and "lean" output is sufficiently low. When both the outputs are shifting to the rich side, the malfunction will be detected.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	
P1144 1144 (Bank 1) P1164 1164 (Bank 2)	Heated oxygen sensor 1 rich shift monitoring	The maximum and minimum voltages from the sensor are beyond the specified voltages.	 Heated oxygen sensor 1 Heated oxygen sensor 1 heater Fuel pressure Injectors 	

DTC Confirmation Procedure

ABS000DX

CAUTION:

Always drive vehicle at a safe speed.

NOTE

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

- Always perform at a temperature above –10°C (14°F).
- Before performing the following procedure, confirm that battery voltage is more than 11V at idle.

(P) WITH CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- 2. Stop engine and wait at least 5 seconds.
- 3. Turn ignition switch "ON" and select "HO2S1 (B1) P1144" or "HO2S1 (B2) P1164" of "HO2S1" in "DTC WORK SUPPORT" mode with CONSULT-II.
- 4. Touch "START".
- 5. Start engine and let it idle for at least 3 minutes.

NOTE:

Never raise engine speed above 3,600 rpm after this step. If the engine speed limit is exceeded, return to step 5.

HO2S1 (B1) P1	144	
110231 (D1) F1		
OUT OF CONDI		
MONITOR		
ENG SPEED		
B/FUEL SCHDL	XXX msec	
COOLAN TEMP/S		
VHCL SPEED SEN		
		PBIB0548E

When the following conditions are met, "TESTING" will be displayed on the CONSULT-II screen. Maintain the conditions continuously until "TESTING" changes to "COMPLETED". (It will take approximately 40 seconds or more.)

ENG SPEED	1,200 - 2,600 rpm
Vehicle speed	Less than 100 km/h (62 MPH)
B/FUEL SCHDL	2.5 - 12.0 msec
Selector lever	Suitable position

If "TESTING" is not displayed after 5 minutes, retry from step 2.

7. Make sure that "OK" is displayed after touching "SELF-DIAG RESULTS". If "NG" is displayed, refer to EC-478, "Diagnostic Procedure".

HQ2S1 (B1) P1		
TESTING		
MONITOR		
ENG SPEED	XXX rpm	
B/FUEL SCHDL	XXX msec	
COOLAN TEMP/S		
VHCL SPEED SEN	XXX km/h	DDIDOC 40E
	•	PBIB0549E

HO2S1 (B1) P1144	
COMPLETED	
OGMI ELTES	
	SEC772C

Overall Function Check

ABS000DY

Use this procedure to check the overall function of the heated oxygen sensor 1 circuit. During this check, a DTC might not be confirmed.

Revision; 2004 April EC-477 2003 G35 Sedan

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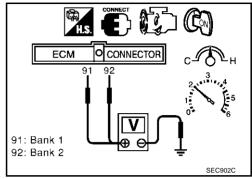
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- 1. Start engine and warm it up to normal operating temperature.
- 2. Set voltmeter probes between ECM terminal 91 [HO2S1(B1) signal] 92 [HO2S1(B2) signal] and engine ground.
- 3. Check one of the following with engine speed held at 2,000 rpm constant under no load.
- The maximum voltage is below 0.8V at least one time.
- The minimum voltage is below 0.35V at least one time.
- 4. If NG, go to EC-478, "Diagnostic Procedure".



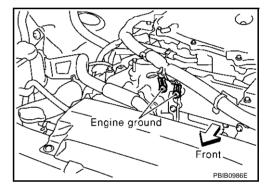
ABS000DZ

Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

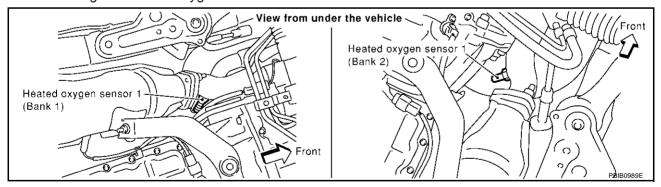
- 1. Turn ignition switch "OFF".
- 2. Loosen and retighten engine ground screws.

>> GO TO 2.



2. RETIGHTEN HEATED OXYGEN SENSOR 1

Loosen and retighten heated oxygen sensor 1.



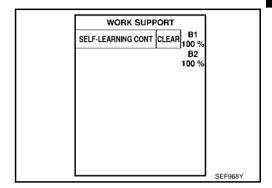
Tightening torque: 40 - 50 N·m (4.1 - 5.1 kg-m, 30 - 37 ft-lb)

>> GO TO 3.

3. CLEAR THE SELF-LEARNING DATA

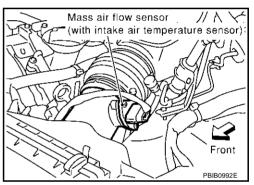
(II) With CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- Select "SELF-LEARNING CONT" in "WORK SUPPORT" mode with CONSULT-II.
- Clear the self-learning control coefficient by touching "CLEAR".
- 4. 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?



(X) Without CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- 2. Turn ignition switch "OFF".
- 3. Disconnect mass air flow sensor harness connector, and restart and run engine for at least 5 seconds at idle speed.
- 4. Stop engine and reconnect mass air flow sensor harness connector.
- 5. Make sure DTC P0102 is displayed.
- 6. Erase the DTC memory. Refer to <u>EC-69</u>, "HOW TO ERASE <u>EMISSION-RELATED DIAGNOSTIC INFORMATION"</u>.
- 7. Make sure DTC P0000 is displayed.
- 8. 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 or No

Yes >> Perform trouble diagnosis for DTC P0172, P0175. Refer to <u>EC-273</u>.

No >> GO TO 4.

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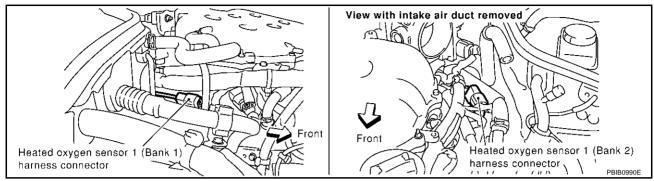
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4. CHECK HO2S1 CONNECTOR FOR WATER

- Turn ignition switch "OFF".
- 2. Disconnect heated oxygen sensor 1 harness connector.



3. Check connectors for water.

Water should not exist.

OK or NG

OK >> GO TO 5.

NG >> Repair or replace harness or connectors.

5. CHECK HEATED OXYGEN SENSOR 1 HEATER

Refer to EC-161, "Component Inspection".

OK or NG

OK >> GO TO 6.

NG >> Replace malfunctioning heated oxygen sensor 1.

6. CHECK HEATED OXYGEN SENSOR 1

Refer to EC-480, "Component Inspection".

OK or NG

OK >> GO TO 7.

NG >> Replace malfunctioning heated oxygen sensor 1.

7. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

For circuit, refer to EC-214, "Wiring Diagram".

>> INSPECTION END

Component Inspection HEATED OXYGEN SENSOR 1

ABS000E0

(With CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- 2. Select "MANU TRIG" and adjust "TRIGGER POINT" to 100% in "DATA MONITOR" mode with CONSULT-II.
- 3. Select "HO2S1 (B1)" and "HO2S1 MNTR (B1)".
- 4. Hold engine speed at 2,000 rpm under no load during the following steps.

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5. Touch "RECORD" on CONSULT-II screen.

г			
	DATA MON		
	MONITOR	NO DTC	
	ENG SPEED	XXX rpm	
	MAS A/F SE-B1	XXX V	
	COOLAN TEMP/S	XXX .C	
	HO2S1 (B1)	XXX V	
	HO2S1 MNTR (B1)	LEAN	
L			SEF646Y

- Check the following.
 - "HO2S1 MNTR (B1)/(B2)" in "DATA MONITOR" mode changes from "RICH" to "LEAN" to "RICH" 5 times in 10 seconds.
 - 5 times (cycles) are counted as shown at right.
 - "HO2S1 (B1)/(B2)" voltage goes above 0.6V at least once.
 - "HO2S1 (B1)/(B2)" voltage goes below 0.3V at least once.
 - "HO2S1 (B1)/(B2)" voltage never exceeds 1.0V.

Bank 1 cycle 1 2	3 4 5				
HO2S1 MNTR (B1) R-L-R-L-R	-L-R-L-R				
Bank 2					
cycle 1 2	3 4 5				
HO2S1 MNTR (B2) R-L-R-L-R	-L-R-L-R				
R means HO2S1 MNTR (B1)/(B2) indicates RICH					
L means HO2S1					
MNTR (B1)/(B2) indicates LEAN	SEF647Y				

Trigger	ENG SPEED	HO2S1 (B1)		128			1axii	mum			<u>ر</u> .		<i>ا</i> ر.		<i>^</i>	·.	 Maximum voltage should be over 0.6V
	rpm	V				/ N		- 1	À	- 1	À		/ \	1	- /	<i>)</i>	at least one time.
XXX	XXX	XXX						•	•	,	•			•		-	at loads one time.
XXX	XXX	XXX				•		1	1	•		Г		1	•		
XXX	XXX	XXX															
XXX	XXX	XXX		64			1	:		1				•	1		
XXX	XXX	XXX		-													 Minimum voltage
XXX	XXX	XXX			i !		i	!	i	- !	i	- 1		1	-	į	should be below 0.30\
XXX	XXX	XXX			1		1	i	1	i	. !	i		1	i	1	at least one time.
XXX	XXX	XXX			V = I		i	!	١,	- !	١.			i	!	i	
XXX	XXX	XXX			i /		ì	!	Ì	- /	į	V/I		١,	•	į.	
XXX	XXX	XXX			W		` _	<i>i</i>	,	, i		`•		`/		Υ.	
XXX	XXX	XXX										_ Mi	nim	um			
XXX	XXX	XXX	1		l												

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 tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.

⋈ Without CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- Set voltmeter probes between ECM terminal 91 [HO2S1 (B1) signal] or 92 [HO2S1 (B2) signal] and engine ground.
- Check the following with engine speed held at 2,000 rpm constant under no load.
 - The voltage fluctuates between 0 to 0.3V and 0.6 to 1.0V more than 5 times within 10 seconds.
 - The maximum voltage is over 0.6V at least one time.
 - The minimum voltage is below 0.3V at least one time.
 - The voltage never exceeds 1.0V.

1 time: 0 - 0.3V \to 0.6 - 1.0V \to 0 - 0.3V 2 times: 0 - 0.3V \to 0.6 - 1.0V \to 0 - 0.3V \to 0.6 - 1.0V

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.

91: Bank 1
92: Bank 2

DTC P1144, P1164 HO2S1

[TYPE 1]

• Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.

Removal and Installation HEATED OXYGEN SENSOR 1

ABS000E1

Refer to EM-24, "EXHAUST MANIFOLD AND THREE WAY CATALYST".

DTC P1146, P1166 HO2S2

PFP:226A0

Component Description

ABS000E2

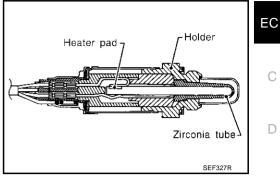
Α

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 heated oxygen 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 1V in richer conditions to 0V in leaner conditions.

Under normal conditions the heated oxygen sensor 2 is not used for engine control operation.



CONSULT-II Reference Value in Data Monitor Mode

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Specification data are reference values.

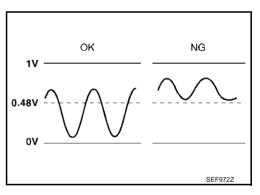
MONITOR ITEM	CON	SPECIFICATION	
HO2S2 (B1) HO2S2 (B2)	Warm-up condition After keeping engine speed	Revving engine from idle to 3,000 rpm	0 - 0.3V ←→ Approx. 0.6 - 1.0V
HO2S2 MNTR (B1) HO2S2 MNTR (B2)	between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	quickly.	$LEAN \longleftrightarrow RICH$

On Board Diagnosis Logic

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The heated oxygen sensor 2 has a much longer switching time between rich and lean than the heated oxygen sensor 1. The oxygen storage capacity of the three way catalyst causes the longer switching time. To judge the malfunctions of heated oxygen sensor 2, ECM monitors whether the minimum voltage of sensor is sufficiently low during the various driving condition such as fuel-cut.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1146 1146 (Bank 1)	Heated oxygen sensor 2 minimum voltage monitoring	The minimum voltage from the sensor is not	 Harness or connectors (The sensor circuit is open or shorted) Heated oxygen sensor 2
P1166 1166 (Bank 2)		reached to the specified voltage.	Fuel pressure Injectors

DTC Confirmation Procedure

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NOTE:

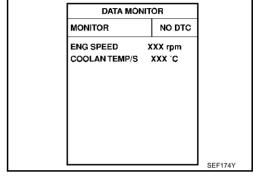
If "DTC confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

(P) WITH CONSULT-II

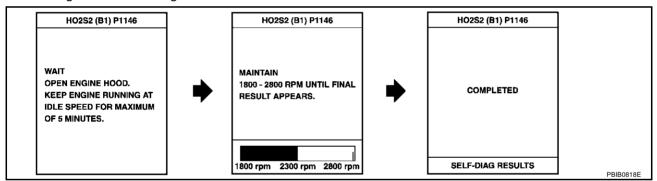
TESTING CONDITION:

For better results, perform "DTC WORK SUPPORT" at a temperature of 0 to 30 °C (32 to 86 °F).

- Turn ignition switch "ON" and select "DATA MONITOR" mode with CONSULT-II.
- 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.
- 5. Let engine idle for 1 minutes.
- 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).



- Open engine hood.
- 8. Select "HO2S2 (B1) P1146" or "HO2S2 (B2) P1166" of "HO2S2" in "DTC WORK SUPPORT" mode with CONSULT-II.
- 9. Start engine and following the instruction of CONSULT-II.



- 10. Make sure that "OK" is displayed after touching "SELF-DIAG RESULTS".
 - If "NG" is displayed, refer to EC-489, "Diagnostic Procedure".
 - If "CAN NOT BE DIAGNOSED" is displayed, perform the following.
- a. Turn ignition switch "OFF" and leave the vehicle in a cool place (soak the vehicle).
- b. Return to step 1.

Overall Function Check

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Use this procedure to check the overall function of the heated oxygen sensor 2 circuit. During this check, a DTC might not be confirmed.

WITH GST

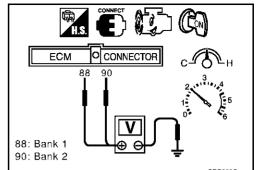
- 1. Start engine and warm it up to the normal operating temperature.
- 2. Turn ignition switch "OFF" and wait at least 10 seconds.
- 3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- 4. Let engine idle for 1 minutes.
- 5. Set voltmeter probes between ECM terminal 88 [HO2S2 (B1) signal] or 90 [HO2S2 (B2) signal] and engine ground.

6. Check the voltage when revving up to 4,000 rpm under no load at least 10 times.

(Depress and release accelerator pedal as soon as possible.) The voltage should be below 0.48V at least once during this procedure.

If the voltage can be confirmed in step 6, step 7 is not necessary.

- 7. Keep vehicle at idling for 10 minutes, then check the voltage. Or check the voltage when coasting from 80 km/h (50 MPH) in "D" position.
 - The voltage should be below 0.48V at least once during this procedure.
- 8. If NG, go to EC-489, "Diagnostic Procedure".



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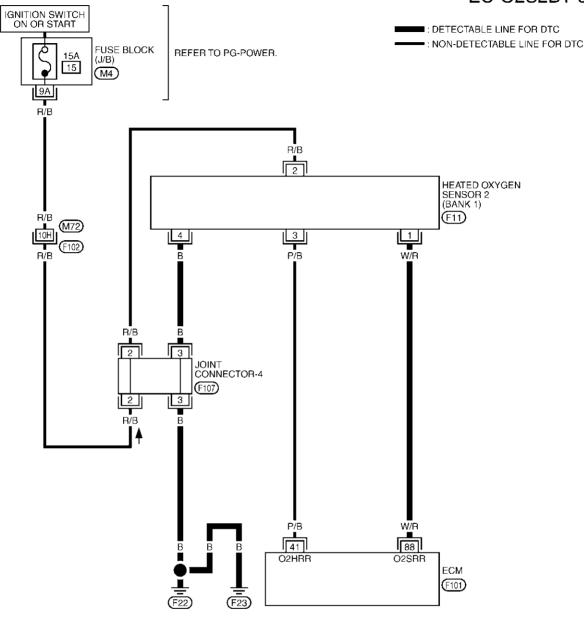
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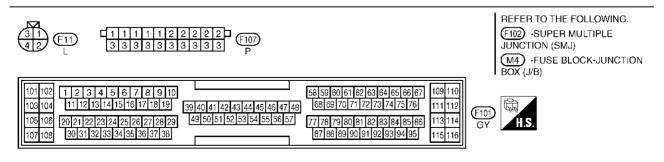
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Wiring Diagram BANK 1

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EC-O2S2B1-01





TBWT0319E

DTC P1146, P1166 HO2S2

[TYPE 1]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
			[Engine is running] ● Warm-up condition	
88	W/R	Heated oxygen sensor 2 (bank 1)	 Revving engine from idle to 3,000 rpm quickly after the following conditions are met. 	0 - Approximately 1.0V
			 After keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load. 	

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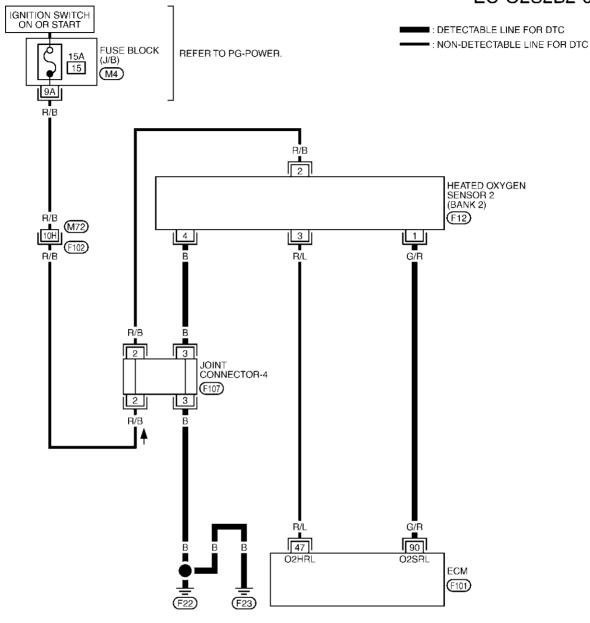
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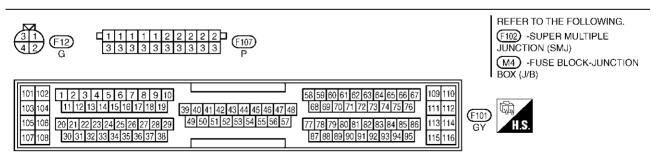
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BANK 2

EC-O2S2B2-01





TBWT0320E

DTC P1146, P1166 HO2S2

[TYPE 1]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

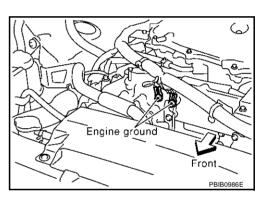
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)	
			[Engine is running] • Warm-up condition		_
90	G/R	Heated oxygen sensor 2 (bank 2)	 Revving engine from idle to 3,000 rpm quickly after the following conditions are met. 	0 - Approximately 1.0V	
			 After keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load. 		

Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

- Turn ignition switch "OFF".
- Loosen and retighten engine ground screws.

>> GO TO 2.



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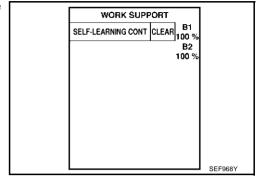
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2. CLEAR THE SELF-LEARNING DATA

(P) With CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- Select "SELF-LEARNING CONT" in "WORK SUPPORT" mode with CONSULT-II.
- Clear the self-learning control coefficient by touching "CLEAR".
- 4. 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?



Mass air flow sensor

(with intake air temperature sensor)

(R) Without CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- 2. Turn ignition switch "OFF".
- 3. Disconnect mass air flow sensor harness connector, and restart and run engine for at least 5 seconds at idle speed.
- Stop engine and reconnect mass air flow sensor harness connector.
- 5. Make sure DTC P0102 is displayed.
- 6. Erase the DTC memory. Refer to <u>EC-69</u>, "<u>HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION</u>".
- 7. Make sure DTC P0000 is displayed.
- 8. 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 <u>EC-273</u>.

No >> GO TO 3.

3. CHECK HO2S2 GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch "OFF".
- 2. Disconnect heated oxygen sensor 2 harness connector.
- Check harness continuity between HO2S2 terminal 4 and engine ground. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to power.

OK or NG

OK >> GO TO 5. NG >> GO TO 4.

Heated oxygen sensor 2 (Bank 1) Heated oxygen sensor 2 (Bank 1) Heated oxygen implementation of the sensor 2 (Bank 1) Heated oxygen implementation of the sensor 2 (Bank 1) Heated oxygen implementation of the sensor 2 (Bank 1) harness connector presented in the sensor 2 (Bank 1) harness connector presented in the sensor 2 (Bank 1)

4. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-4
- Harness for open or short between HO2S2 and engine ground

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

Revision; 2004 April EC-490 2003 G35 Sedan

5. CHECK HO2S2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Disconnect ECM harness connector.
- Check harness continuity between ECM terminal and HO2S2 terminal as follows. Refer to Wiring Diagram.

DTC	Term	Bank	
ыс	ECM	Sensor	Dank
P1146	88	1	1
P1166	90	1	2

Continuity should exist.

3. Check harness continuity between the following terminals and ground. Refer to Wiring Diagram.

DTC	Term	Bank	
ыс	ECM	Sensor	Dank
P1146	88	1	1
P1166	90	1	2

Continuity should not exist.

4. Also check harness for short to power.

OK or NG

OK >> GO TO 6.

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

6. CHECK HEATED OXYGEN SENSOR 2

Refer to EC-491, "Component Inspection".

OK or NG

OK >> GO TO 7.

NG >> Replace malfunctioning heated oxygen sensor 2.

7. CHECK INTERMITTENT INCIDENT

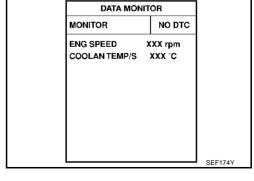
Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

Component Inspection HEATED OXYGEN SENSOR 2

(P) With CONSULT-II

- 1. Turn ignition switch "ON" and select "DATA MONITOR" mode with CONSULT-II.
- 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.
- 5. Let engine idle for 1 minutes.



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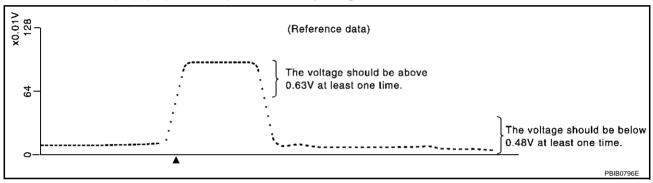
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6. Select "FUEL INJECTION" in "ACTIVE TEST" mode, and select "HO2S2 (B1)/(B2)" as the monitor item with CONSULT-II.

ACTIVE TES		
FUEL INJECTION	25 %	
MONITOR		
ENG SPEED	XXX rpm	
HO2S1 (B1)	XXX V	
HO2S2 (B1)	xxx v	
HO2S1 MNTR (B1)	RICH	
HO2S2 MNTR (B1)	RICH	
		SEF662Y

Check "HO2S2 (B1)/(B2)" at idle speed when adjusting "FUEL INJECTION" to ±25%.



"HO2S2 (B1)/(B2)" should be above 0.63V at least once when the "FUEL INJECTION" is +25%. "HO2S2 (B1)/(B2)" should be below 0.48V at least once when the "FUEL INJECTION" is -25%.

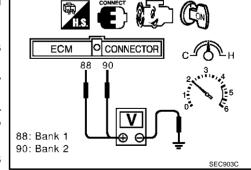
CAUTION:

- 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 tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.

⋈ Without CONSULT-II

- 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 minutes.
- 5. Set voltmeter probes between ECM terminal 88 [HO2S2 (B1) signal] or 90 [HO2S2 (B2) signal] and engine ground.
- Check the voltage when revving up to 4,000 rpm under no load at least 10 times.
 - (Depress and release accelerator pedal as soon as possible.)

 The voltage should be above 0.63V at least once during this procedure.
 - If the voltage is above 0.63V at step 6, step 7 is not necessary.
- Keep vehicle at idling for 10 minutes, then check voltage. Or check the voltage when coasting from 80 km/h (50 MPH) in "D" position.
 - The voltage should be below 0.48V at least once during this procedure.
- 8. If NG, replace 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 tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.

DTC P1146, P1166 HO2S2

[TYPE 1]

Removal and Installation HEATED OXYGEN SENSOR 2

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Refer to EM-24, "EXHAUST MANIFOLD AND THREE WAY CATALYST".

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DTC P1147, P1167 HO2S2

PFP:226A0

Component Description

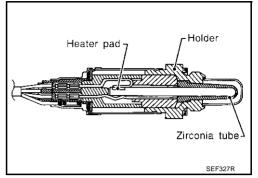
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The heated oxygen sensor 2, after three way catalyst 1, monitors the oxygen level in the exhaust gas on each bank.

Even if switching characteristics of the heated oxygen 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 1V in richer conditions to 0V in leaner conditions.

Under normal conditions the heated oxygen sensor 2 is not used for engine control operation.



CONSULT-II Reference Value in Data Monitor Mode

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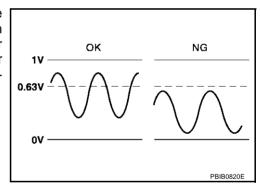
Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
HO2S2 (B1) HO2S2 (B2)	Warm-up conditionAfter keeping engine speed	Revving engine from idle to 3,000 rpm	0 - 0.3V ←→ Approx. 0.6 - 1.0V
HO2S2 MNTR (B1) HO2S2 MNTR (B2)	between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	quickly.	$LEAN \longleftrightarrow RICH$

On Board Diagnosis Logic

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The heated oxygen sensor 2 has a much longer switching time between rich and lean than the heated oxygen sensor 1. The oxygen storage capacity before the three way catalyst 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 the various driving condition such as fuel-cut.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1147 1147 (Bank 1)	Heated oxygen sensor 2 maximum voltage monitoring	The maximum voltage from the sensor is not	 Harness or connectors (The sensor circuit is open or shorted) Heated oxygen sensor 2
P1167 1167 (Bank 2)		reached to the specified voltage.	Fuel pressureInjectorsIntake air leaks

DTC Confirmation Procedure

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NOTE:

If "DTC confirmation Procedure" has been previously conducted, always turn ignition switch OFF" and wait at least 10 seconds before conducting the next test.

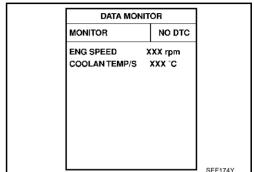
(P) WITH CONSULT-II

TESTING CONDITION:

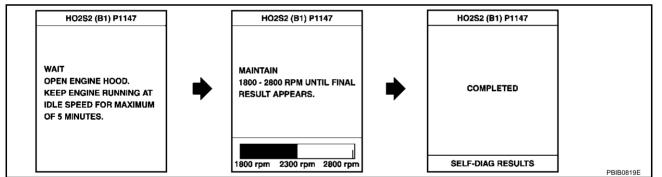
For better results, perform "DTC WORK SUPPORT" at a temperature of 0 to 30 °C (32 to 86 °F).

- Turn ignition switch "ON" and select "DATA MONITOR" mode with CONSULT-II.
- 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 minutes.
- 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).



- Open engine hood.
- 8. Select "HO2S2 (B1) P1147" or "HO2S2 (B2) P1167" of "HO2S2" in "DTC WORK SUPPORT" mode with CONSULT-II.
- Start engine and following the instruction of CONSULT-II.



- 10. Make sure that "OK" is displayed after touching "SELF-DIAG RESULTS". If "NG" is displayed, refer to EC-500, "Diagnostic Procedure".
 - If "CAN NOT BE DIAGNOSED" is displayed, perform the following.
- Turn ignition switch "OFF" and leave the vehicle in a cool place (soak the vehicle).
- b. Return to step 1.

Overall Function Check

ABS000NV

Use this procedure to check the overall function of the heated oxygen sensor 2 circuit. During this check, a DTC might not be confirmed.

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.
- 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 minutes.
- 5. Set voltmeter probes between ECM terminal 88 [HO2S2 (B1) signal] or 90 [HO2S2 (B2) signal] and engine ground.

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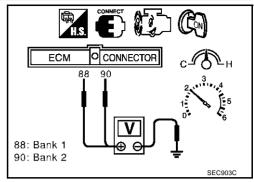
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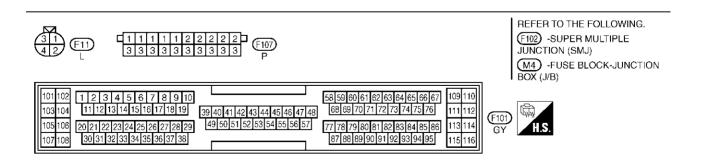
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- 6. Check the voltage when revving up to 4,000 rpm under no load at least 10 times.
 - (Depress and release accelerator pedal as soon as possible.) The voltage should be above 0.63V at least once during this procedure.
 - If the voltage can be confirmed in step 6, step 7 is not necessary.
- 7. Keep vehicle at idling for 10 minutes, then check the voltage. Or check the voltage when coasting from 80 km/h (50 MPH) in "D" position.
 - The voltage should be above 0.63V at least once during this procedure.
- 8. If NG, go to EC-500, "Diagnostic Procedure".



DTC P1147, P1167 HO2S2 [TYPE 1] Wiring Diagram BANK 1 ABS000EG Α EC-02S2B1-01 IGNITION SWITCH ON OR START EC : DETECTABLE LINE FOR DTC : NON-DETECTABLE LINE FOR DTC FUSE BLOCK REFER TO PG-POWER. (J/B) (M4) C D R/B 2 Е HEATED OXYGEN SENSOR 2 (BANK 1) R/B 10H R/B (F11) 4 3 (F102) W/R P/B G Н 2 JOINT CONNECTOR-4 (F107) R/B W/R 88 41



O2HRR

ECM (F101)

TBWT0319E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
88	W/R	Heated oxygen sensor 2 (bank 1)	 [Engine is running] Warm-up condition Revving engine from idle to 3,000 rpm quickly after the following conditions are met. After keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load. 	0 - Approximately 1.0V

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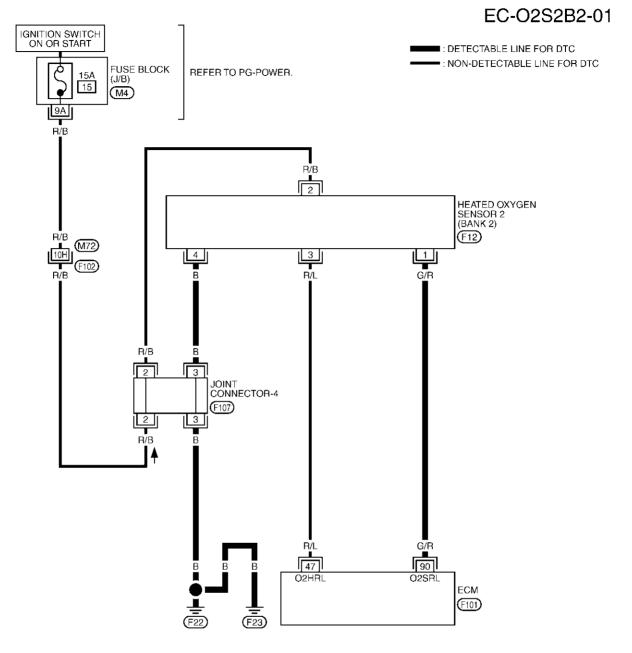
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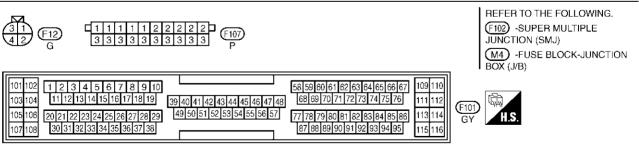
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TBWT0320E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
			[Engine is running] ■ Warm-up condition	
90	G/R	Heated oxygen sensor 2 (bank 2)	 Revving engine from idle to 3,000 rpm quickly after the following conditions are met. 	0 - Approximately 1.0V
			 After keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load. 	

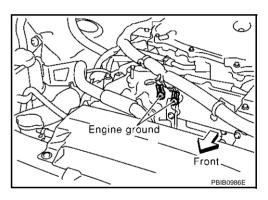
Diagnostic Procedure

ABS000EH

1. RETIGHTEN GROUND SCREWS

- 1. Turn ignition switch "OFF".
- 2. Loosen and retighten engine ground screws.

>> GO TO 2.

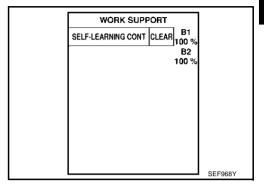


EC

2. clear the self-learning data

(P) With CONSULT-II

- Start engine and warm it up to normal operating temperature.
- Select "SELF-LEARNING CONT" in "WORK SUPPORT" mode with CONSULT-II.
- 3. Clear the self-learning control coefficient by touching "CLEAR".
- 4. 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?



Without CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- Turn ignition switch "OFF".
- 3. Disconnect mass air flow sensor harness connector, and restart and run engine for at least 5 seconds at idle speed.
- Stop engine and reconnect mass air flow sensor harness connector.
- Make sure DTC P0102 is displayed. 5.
- 6. Erase the DTC memory. Refer to EC-69, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION".
- Make sure DTC P0000 is displayed.
- 8. 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 P0171or P0174. Refer to EC-264.

No >> GO TO 3.

3. CHECK HO2S2 GROUND CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch "OFF".
- 2. Disconnect heated oxygen sensor 2 harness connector.
- 3. Check harness continuity between HO2S2 terminal 4 and engine ground. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to power.

OK or NG

OK NG >> GO TO 4.

Heated oxygen Min آرز Heated oxygen >> GO TO 5. sensor 2 (Bank 2) harness connector

4. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-4
- Harness for open or short between HO2S2 and engine ground

Mass air flow sensor // N (with intake air temperature sensor) Front

View from under the vehicle

Heated oxygen

sensor 2 (Bank 2)

PBIB0992E

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sensor 2 (Bank 1)

Heated oxygen 7

sensor 2 (Bank 1

harness connector

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

EC-501 Revision; 2004 April 2003 G35 Sedan

5. CHECK HO2S2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Disconnect ECM harness connector.
- 2. Check harness continuity between ECM terminal and HO2S2 terminal as follows. Refer to Wiring Diagram.

DTC	Terminals		Bank
ыс	ECM	Sensor	Dank
P1147	88	1	1
P1167	90	1	2

Continuity should exist.

Check harness continuity between the following terminals and ground. Refer to Wiring Diagram.

DTC	Term	Terminals	
ыс	ECM	Sensor	Bank
P1147	88	1	1
P1167	90	1	2

Continuity should not exist.

4. Also check harness for short to power.

OK or NG

OK >> GO TO 6.

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

6. CHECK HEATED OXYGEN SENSOR 2

Refer to EC-502, "Component Inspection".

OK or NG

OK >> GO TO 7.

NG >> Replace malfunctioning heated oxygen sensor 2.

7. CHECK INTERMITTENT INCIDENT

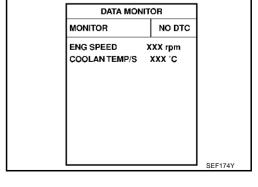
Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

Component Inspection HEATED OXYGEN SENSOR 2

(P) With CONSULT-II

- 1. Turn ignition switch "ON" and select "DATA MONITOR" mode with CONSULT-II.
- 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.
- 5. Let engine idle for 1 minutes.



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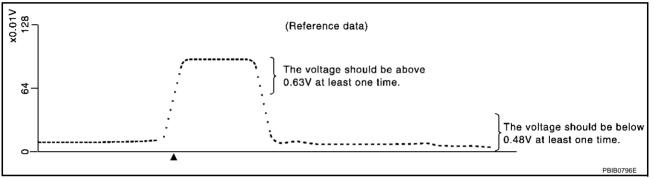
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6. Select "FUEL INJECTION" in "ACTIVE TEST" mode, and select "HO2S2 (B1)/(B2)" as the monitor item with CONSULT-II.

ACTIVE TEST		
FUEL INJECTION	25 %	
MONITOR		
ENG SPEED	XXX rpm	
HO2S1 (B1)	XXX V	
HO2S2 (B1)	XXX V	
HO2S1 MNTR (B1)	RICH	
HO2S2 MNTR (B1)	RICH	
·		
		SEF662Y

7. Check "HO2S2 (B1)/(B2)" at idle speed when adjusting "FUEL INJECTION" to ±25%.



"HO2S2 (B1)/(B2)" should be above 0.63V at least once when the "FUEL INJECTION" is +25%. "HO2S2 (B1)/(B2)" should be below 0.48V at least once when the "FUEL INJECTION" is -25%.

CAUTION:

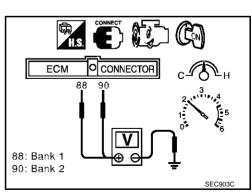
- Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved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

R Without CONSULT-II

- 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 minutes.
- 5. Set voltmeter probes between ECM terminal 88 [HO2S2 (B1) signal] or 90 [HO2S2 (B2) signal] and engine ground.
- 6. Check the voltage when revving up to 4,000 rpm under no load at least 10 times.
 - (Depress and release accelerator pedal as soon as possible.) The voltage should be above 0.63V at least once during this
 - If the voltage is above 0.63V at step 6, step 7 is not necessary.
- Keep vehicle at idling for 10 minutes, then check voltage. Or check the voltage when coasting from 80 km/h (50 MPH) in "D" position.
 - The voltage should be below 0.48V at least once during this procedure.
- 8. If NG, replace 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 tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.



DTC P1147, P1167 HO2S2

[TYPE 1]

Removal and Installation HEATED OXYGEN SENSOR 2

ABS000EJ

Refer to EM-24, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

DTC P1148, P1168 CLOSED LOOP CONTROL

[TYPE 1]

DTC P1148, P1168 CLOSED LOOP CONTROL

PFP:22690

On Board Diagnosis Logic

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These self-diagnoses have the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1148 1148 (Bank 1)	Closed loop control	The closed loop control function for bank 1 does not operate even when vehicle is driving in the specified condition.	The heated oxygen sensor 1 circuit is open or shorted.
P1168 1168 (Bank 2)	function	The closed loop control function for bank 2 does not operate even when vehicle is driving in the specified condition.	Heated oxygen sensor 1Heated oxygen sensor heater

DTC Confirmation Procedure

ABS000EL

CAUTION:

Always drive vehicle at a safe speed.

NOTE

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

- Never raise engine speed above 3,600 rpm during the "DTC Confirmation Procedure". If the engine speed limit is exceeded, retry the procedure from step 2.
- Before performing the following procedure, confirm that battery voltage is more than 11V at idle.

(P) WITH CONSULT-II

- Start engine and warm it up to normal operating temperature.
- Select "DATA MONITOR" mode with CONSULT-II.
- 3. Hold engine speed at 2,000 rpm and check one of the following.
- "HO2S1 (B1)/(B2)" voltage should go above 0.70V at least once.
- "HO2S1 (B1)/(B2)" voltage should go below 0.21V at least once.
 If the check result is NG, perform <u>EC-506</u>, "<u>Diagnostic Procedure</u>".

If the check result is OK, perform the following step.

- 4. Let engine idle at least 5 minutes.
- Maintain the following condition at least 50 consecutive seconds.

DA IA MOIN		1
MONITOR	NO DTC	
ENG SPEED	XXX rpm	
COOLAN TEMP/S	XXX °C	
HQ2\$1 (B1)	XXX V	
HO2\$1 (B2)	XXX V	
		SEC0110

DATA MONITOR

B/FUEL SCHDL	2.5 msec or more
ENG SPEED	More than 1,500 rpm
Selector lever	Suitable position
VHCL SPEED SE	More than 70 km/h (43 MPH)

During this test, P0132 and/or P0152 may be displayed on CONSULT-II screen.

6. If DTC is detected, go to EC-506, "Diagnostic Procedure".

Overall Function Check

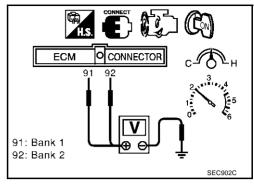
ABS000EM

Use this procedure to check the overall function of the closed loop control. During this check, a DTC might not be confirmed.

Revision; 2004 April EC-505 2003 G35 Sedan

WITH GST

- 1. Start engine and warm it up to normal operating temperature.
- 2. Set voltmeter probes between ECM terminal 91 [HO2S1 (B1) signal] or 92 [HO2S1 (B2) signal] and engine ground.
- 3. Check the following with engine speed held at 2,000 rpm constant under no-load.
- The voltage should go above 0.70V at least once.
- The voltage should go below 0.21V at least once.
- 4. If NG, go to EC-506, "Diagnostic Procedure".



Diagnostic Procedure

ABS000EN

Perform trouble diagnosis for "DTC P0133, P0153". Refer to EC-227, "Diagnostic Procedure" .

DTC P1211 TCS CONTROL UNIT

[TYPE 1]

DTC P1211 TCS CONTROL UNIT

PFP:47850

Description

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The malfunction information related to TCS is transferred through the CAN communication line from VDC/TCS/ABS control unit to ECM.

TCS/ABS control unit to ECM.

Be sure to erase the malfunction information such as DTC not only for VDC/TCS/ABS control unit but also for ECM after TCS related repair.

On Board Diagnosis Logic

ABS000EP

Freeze frame data is not stored in the ECM for this self-diagnosis. The MIL will not light up for this self-diagnosis.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1211	TCS control unit	ECM receives a malfunction information from VDC/TCS/ABS control unit.	VDC/TCS/ABS control unit
1211	103 control unit		 TCS related parts

DTC Confirmation Procedure

ABS000EQ

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10.5V at idle.

(P) WITH CONSULT-II

- 1. Turn ignition switch "ON".
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- 3. Start engine and let it idle for at least 60 seconds.
- 4. If 1st trip DTC is detected, go to EC-507, "Diagnostic Procedure"

DATA M	ONITOR
MONITOR	NO DTC
ENG SPEED	XXX rpm

WITH GST

Follow the procedure "WITH CONSULT-II" above.

Diagnostic Procedure

Go to BRC-13, "TROUBLE DIAGNOSIS".

ABS000ER

Revision; 2004 April EC-507 2003 G35 Sedan

[TYPE 1]

DTC P1212 TCS COMMUNICATION LINE

PFP:47850

DescriptionABS000ES

NOTE:

If DTC P1212 is displayed with DTC U1000 or U1001, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-142, "DTC U1000, U1001 CAN COMMUNICATION LINE".

This CAN communication line is used to control the smooth engine operation during the TCS operation. Pulse signals are exchanged between ECM and VDC/TCS/ABS control unit.

Be sure to erase the malfunction information such as DTC not only for VDC/TCS/ABS control unit but also for ECM after TCS related repair.

On Board Diagnosis Logic

ABS000FT

Freeze frame data is not stored in the ECM for this self-diagnosis. The MIL will not light up for this self-diagnosis.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1212 1212	TCS communication line	ECM can not receive the information from VDC/TCS/ABS control unit continuously.	 Harness or connectors (The CAN communication line is open or shorted.) VDC/TCS/ABS control unit Dead (Weak) battery

DTC Confirmation Procedure

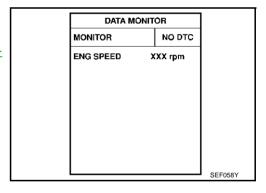
ABS000EU

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10.5V at idle.

(P) WITH CONSULT-II

- 1. Turn ignition switch "ON".
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- 3. Start engine and let it idle for at least 10 seconds.
- 4. If a 1st trip DTC is detected, go to EC-508, "Diagnostic Procedure".



WITH GST

Follow the procedure "WITH CONSULT-II" above.

Diagnostic Procedure

ABS000EV

1. CHECK VDC/TCS/ABS CONTROL UNIT FUNCTION

Refer to BRC-13, "TROUBLE DIAGNOSIS".

>> INSPECTION END

[TYPE 1]

DTC P1217 ENGINE OVER TEMPERATURE

PFP:00000

Description SYSTEM DESCRIPTION

ARSOONEW

NOTE:

If DTC P1217 is displayed with DTC U1000 or U1001, first perform the trouble diagnosis for DTC U1000 or U1001. Refer to EC-142, "DTC U1000, U1001 CAN COMMUNICATION LINE".

Cooling Fan Control

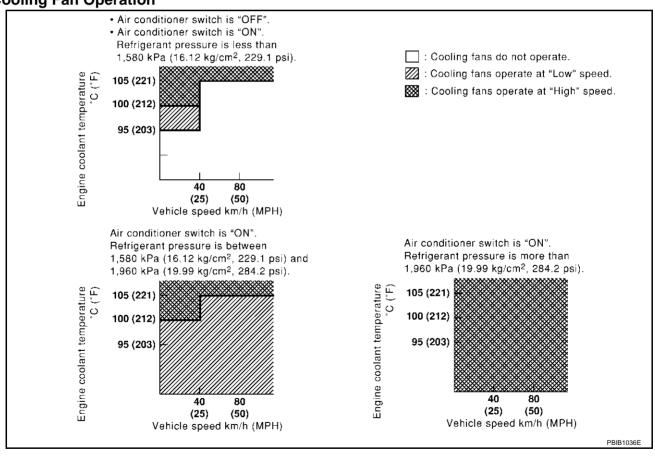
Sensor	Input Signal to ECM	ECM function	Actuator	
Wheel sensor	Vehicle speed*			
Engine coolant temperature sensor	Engine coolant temperature			
Air conditioner switch	Air conditioner "ON" signal*	Cooling fan	IPDM E/R (Cooling fan relays)	
Ignition switch	Start signal		(Sooming tarriolays)	
Refrigerant pressure sensor	Refrigerant pressure			

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

The ECM controls the cooling fan corresponding to the vehicle speed, engine coolant temperature, refrigerant pressure, and air conditioner ON signal. The control system has 3-step control [ON (high speed)/ON (low speed)/OFF].

Cooling Fan Operation

Revision; 2004 April



EC-509 2003 G35 Sedan

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Cooling Fan Relay Operation

The ECM controls cooling fan relays in the IPDM E/R through CAN communication line.

Cooling fan speed	Cooling fan relay		
Cooling lan speed	1	2	3
Stop	OFF	OFF	OFF
Low	OFF	ON	ON
High	ON	ON	ON

COMPONENT DESCRIPTION

Cooling Fan Motor

The cooling fan operates at each speed when the current flows in the cooling fan motor as follows.

Cooling fan speed	Cooling fan motor terminals		
Cooling lair speed	(+)	(-)	
Low	1	3 and 4	
LOW	2	3 and 4	
High	1 and 2	3 and 4	

CONSULT-II Reference Value in Data Monitor Mode

ABS0000J

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
	• Engine: After warming up, idla	Air conditioner switch: OFF	OFF
AIR COND SIG	Engine: After warming up, idle the engine	Air conditioner switch: ON (Compressor operates.)	ON
		Engine coolant temperature is 94°C (201°F) or less	OFF
COOLING FAN	Engine: After warming up, idle the engineAir conditioner switch: OFF	Engine coolant temperature is between 95°C (203°F) and 99°C (210°F)	ON (Low speed)
		Engine coolant temperature is 100°C (212°F) or more	ON (High speed)

On Board Diagnosis Logic

ABS000EY

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.

This self-diagnosis has the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1217 1217	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.) Cooling fan Radiator hose Radiator Radiator cap Water pump Thermostat Cooling fan (crankshaft driven) For more information, refer to EC-520. "Main 12 Causes of Overheating".

[TYPE 1]

CAUTION:

When a malfunction is indicated, be sure to replace the coolant. Refer to <u>CO-11, "Changing Engine Coolant"</u>. Also, replace the engine oil. Refer to <u>LU-8, "Changing Engine Oil"</u>.

- 1. Fill radiator with coolant up to specified level with a filling speed of 2 liters per minute. Be sure to use coolant with the proper mixture ratio. Refer to MA-12, "Anti-Freeze Coolant Mixture Ratio".
- 2. After refilling coolant, run engine to ensure that no water-flow noise is emitted.

Overall Function Check

BS000EZ

Use this procedure to check the overall function of the cooling fan. During this check, a DTC might not be confirmed.

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.

(P) WITH CONSULT-II

- Check the coolant level in the reservoir tank and radiator.
 Allow engine to cool before checking coolant level.
 If the coolant level in the reservoir tank and/or radiator is below the proper range, skip the following steps and go to <u>EC-514</u>, <a href="Diagnostic Procedure".
- 2. Confirm whether customer filled the coolant or not. If customer filled the coolant, skip the following steps and go to EC-514, "Diagnostic Procedure".
- 3. Start engine.

Be careful not to overheat engine.

 Make sure that cooling fan (crankshaft driven) operates normally.

If NG, refer to CO-22, "COOLING FAN".

If OK, go to the following step.

- Stop engine and turn ignition switch "ON".
- 6. Select "ENGINE COOOANT TEMP" in "ACTIVE TEST" mode with CONSULT-II.
- 7. Set "ENGINE COOOANT TEMP" to 95° (203°F) by touching "Qu" and "UP" on CONSULT-II screen.
- 8. Make sure that cooling fan operates at low speed.

If NG, go to EC-518, "PROCEDURE A".

If OK, go to the following step.

- Set "ENGINE COOOANT TEMP" to 100° (212°F) by touching "Qu" and "UP" on CONSULT-II screen.
- 10. Make sure that cooling fan operates at higher speed than low speed.

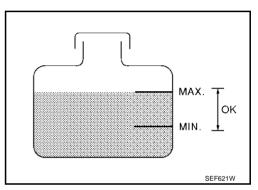
If NG, go to EC-519, "PROCEDURE B".

If OK, go to the following step.

- 11. Turn ignition switch "OFF".
- 12. Check cooling fan motor ground circuit.

Refer to procedure 4 in EC-514, "Diagnostic Procedure".

If NG, follow the construction of procedure 4 in EC-514, "Diagnostic Procedure".



1			
	ACTIVE TES		
	ENG COOLANTTEMP XXX °C		
	MONITOR	l	
	ENG SPEED	XXX rpm	
	INJ PULSE-B1	XXX msec	
	IGN TIMING	XXX BTDC	
	COOLING FAN	ON	
		_	PBIB0974E

Revision; 2004 April EC-511 2003 G35 Sedan

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® WITH GST

- Check the coolant level in the reservoir tank and radiator.
 Allow engine to cool before checking coolant level.
 If the coolant level in the reservoir tank and/or radiator is below the proper range, skip the following steps and go to EC-514.

 "Diagnostic Procedure"
- Confirm whether customer filled the coolant or not. If customer filled the coolant, skip the following steps and go to <u>EC-514</u>, "Diagnostic Procedure".
- 3. Start engine.

Be careful not to overheat engine.

 Make sure that cooling fan (crankshaft driven) operates normally.

If NG, refer to CO-22, "COOLING FAN".

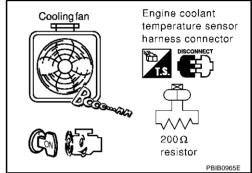
If OK, go to the following step.

- 5. Turn ignition switch "OFF".
- 6. Disconnect engine coolant temperature sensor harness connector.
- 7. Connect 200Ω resister to the engine coolant temperature sensor harness connector.
- 8. Start engine and make sure that cooling fan operates at low speed.

If NG, go to EC-518, "PROCEDURE A".

If OK, go to the following step.

- 9. Turn ignition switch "OFF".
- 10. Disconnect 200Ω resister from engine coolant temperature sensor harness connector.

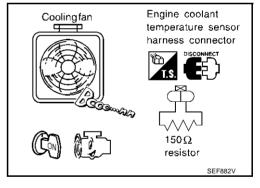


- 11. Connect 150 Ω resister to engine coolant temperature sensor harness connector.
- 12. Restart engine and make sure that cooling fan operates at higher speed than low speed.

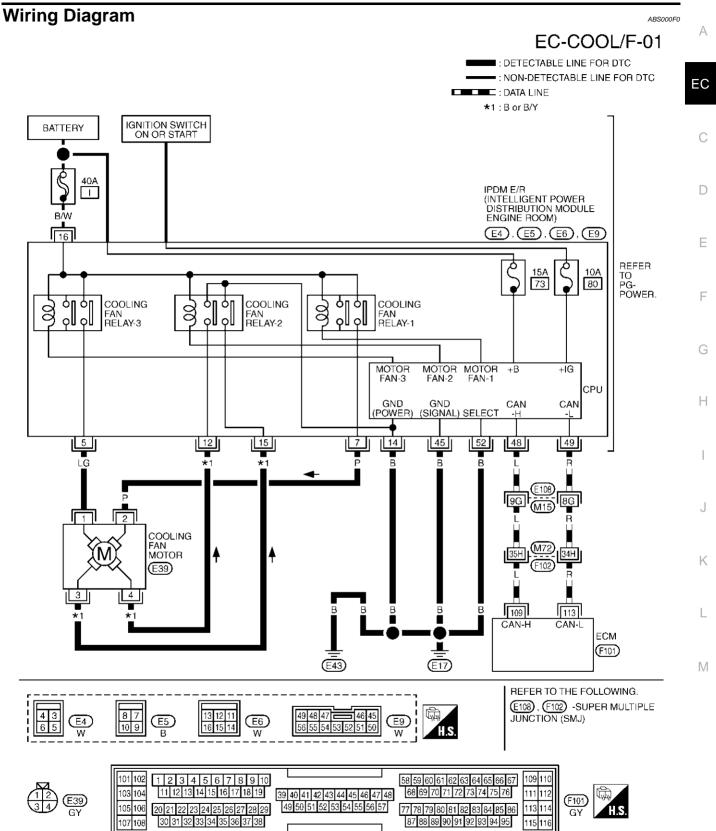
If NG, go to EC-519, "PROCEDURE B".

If OK, go to the following step.

- 13. Turn ignition switch "OFF".
- 14. Check cooling fan motor ground circuit. Refer to procedure 7 in <u>EC-514</u>, "<u>Diagnostic Procedure</u>". If NG, follow the construction of procedure 7 in <u>EC-514</u>, "<u>Diagnostic Procedure</u>".



[TYPE 1]



TBWT0324E

[TYPE 1]

ABS000F1

Diagnostic Procedure

1. CHECK COOLING FAN (CRANKSHAFT DRIVEN)

1. Start engine and let it idle.

2. Make sure that cooling fan (crankshaft driven) operates normally.

OK or NG

OK (With CONSULT-II)>>GO TO 2.

OK (without CONSULT-II)>>GO TO 5.

NG >> Check cooling fan (crankshaft driven). Refer to CO-22.

2. CHECK COOLING FAN LOW SPEED OPERATION

(III) With CONSULT-II

- 1. Select "ENGINE COOOANT TEMP" in "ACTIVE TEST" mode with CONSULT-II.
- 2. Set "ENGINE COOOANT TEMP" to 95° (203°F) by touching "Qu" and "UP" on CONSULT-II screen.
- 3. Make sure that cooling fan operates at low speed.

OK or NG

OK >> GO TO 3.

NG >> Check cooling fan low speed control circuit. (Go to <u>EC-518. "PROCEDURE A"</u>.)

3. CHECK COOLING FAN HIGH SPEED OPERATION

(III) With CONSULT-II

- 1. Set "ENGINE COOOANT TEMP" to 100° (212°F) by touching "Qu" and "UP" on CONSULT-II screen.
- Make sure that cooling fan operates at higher speed than low speed.

OK or NG

OK >> GO TO 4.

NG >> Check cooling fan high speed control circuit. (Go to <u>EC-519, "PROCEDURE B"</u>.)

ACTIVE TEST		
ENG COOLANT TEMP	XXX C	
MONITOR		
ENG SPEED	XXX rpm	
INJ PULSE-B1	XXX msec	
IGN TIMING	XXX BTDC	
COOLING FAN	ON	
		PBIB0974E

[TYPE 1]

4. CHECK COOLING FAN MOTOR GROUND CIRCUIT FOR OPEN AND SHORT-I

(II) With CONSULT-II

- 1. Turn ignition switch "OFF".
- 2. Disconnect cooling fan motor harness connector.
- 3. Turn ignition switch "ON".
- 4. Select "ENGINE COOOANT TEMP" in "ACTIVE TEST" mode with CONSULT-II.
- 5. Set "ENGINE COOOANT TEMP" to 95° (203°F) by touching "Qu" and "UP" on CONSULT-II screen.
- 6. Check harness continuity between cooling fan motor terminals 3, 4 and IPDM E/R terminal 14. Refer to Wiring Diagram.

Continuity should exist.

7. Also check harness for short to power.

OK or NG

OK >> GO TO 9. NG >> GO TO 8.

CHECK COOLING FAN LOW SPEED OPERATION

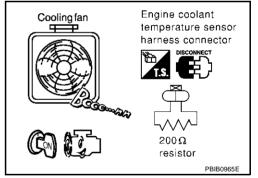
W Without CONSULT-II

- 1. Turn ignition switch "OFF".
- 2. Disconnect engine coolant temperature sensor harness connector.
- 3. Connect 200Ω resistor to the engine coolant temperature sensor harness connector.
- 4. Start engine and make sure that cooling fan operates at low speed.

OK or NG

OK >> GO TO 6.

NG >> Check cooling fan low speed control circuit. (Go to EC-518, "PROCEDURE A" .)



6. CHECK COOLING FAN HIGH SPEED OPERATION

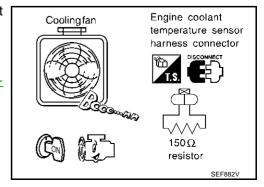
® Without CONSULT-II

- 1. Turn ignition switch "OFF".
- 2. Disconnect 200Ω resistor from engine coolant temperature sensor harness connector.
- 3. Connect 150Ω resistor to engine coolant temperature sensor harness connector.
- 4. Restart engine and make sure that cooling fan operates at higher speed than low speed.

OK or NG

OK >> GO TO 7.

NG >> Check cooling fan high speed control circuit. (Go to $\underline{\text{EC-}}$ $\underline{519}$, "PROCEDURE B" .)



ACTIVE TEST

ENG COOLANT TEMP XXX 'C

MONITOR

ENG SPEED XXX rpm

INJ PULSE-B1 XXX msec

IGN TIMING XXX BTDC

COOLING FAN ON

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$7.\,$ CHECK COOLING FAN MOTOR GROUND CIRCUIT FOR OPEN AND SHORT-I

Without CONSULT-II

- 1. Turn ignition switch "OFF".
- 2. Disconnect cooling fan motor harness connector.
- 3. Disconnect engine coolant temperature sensor harness connector.
- 4. Connect 150Ω resistor to the engine coolant temperature sensor harness connector.
- 5. Turn ignition switch "ON".
- 6. Check harness continuity between cooling fan motor terminals 3,4 and IPDM E/R terminal 14. Refer to Wiring Diagram.

Continuity should exist.

7. Also check harness for short to power.

OK or NG

OK >> GO TO 9. NG >> GO TO 8.

8. CHECK COOLING FAN MOTOR GROUND CIRCUIT FOR OPEN AND SHORT-II

- Turn ignition switch "OFF".
- 2. Disconnect IPDM E/R harness connector E6.
- Check harness continuity between the following; cooling fan motor terminal 3 and IPDM E/R terminal 15 cooling fan motor terminal 4 and IPDM E/R terminal 12. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to power.

OK or NG

OK >> Replace IPDM E/R.

NG >> Repair open circuit or short to power in harness or connector.

9. CHECK COOLING SYSTEM FOR LEAK

Apply pressure to the cooling system with a tester, and check if the pressure drops.

Testing pressure: 157 kPa (1.6 kg/cm², 23 psi)

CAUTION:

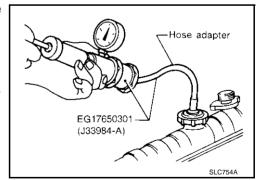
Higher than the specified pressure may cause radiator damage. Pressure should not drop.

OK or NG

OK >> GO TO 10.

NG >> Check the following for leak

- Hose
- Radiator
- Water pump Refer to <u>CO-26, "WATER PUMP"</u>.



[TYPE 1]

10. CHECK RADIATOR CAP

Apply pressure to cap with a tester.

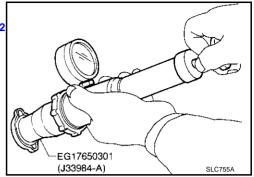
Radiator cap relief pressure: 59 - 98 kPa (0.6 - 1.0 kg/cm²

, 9 - 14 psi)

OK or NG

OK >> GO TO 11.

NG >> Replace radiator cap.



11. CHECK THERMOSTAT

1. Check valve seating condition at normal room temperatures. **It should seat tightly.**

2. Check valve opening temperature and valve lift.

Valve opening temperature: 82°C (180°F) [standard]
Valve lift: More than 8.6 mm/95°C

(0.339 in/203°F)

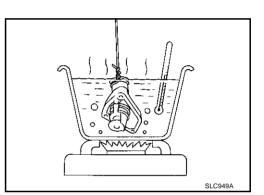
3. Check if valve is closed at 5°C (9°F) below valve opening temperature.

For details, refer to CO-30, "THERMOSTAT AND THERMOSTAT HOUSING".



OK >> GO TO 12.

NG >> Replace thermostat.



12. CHECK ENGINE COOLANT TEMPERATURE SENSOR

Refer to EC-194, "Component Inspection".

OK or NG

OK >> GO TO 13.

NG >> Replace engine coolant temperature sensor.

13. CHECK MAIN 12 CAUSES

If the cause cannot be isolated, go to EC-520, "Main 12 Causes of Overheating".

>> INSPECTION END

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PROCEDURE A

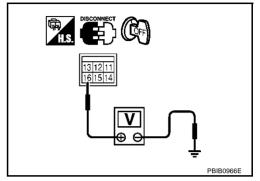
1. CHECK POWER SUPPLY CIRCUIT

- 1. Turn ignition switch "OFF".
- 2. Disconnect IPDM E/R harness connectors E6.
- Check voltage between IPDM E/R terminal 16 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 3. NG >> GO TO 2.



2. DETECT MALFUNCTIONING PART

Check the following.

- 40A fusible link
- Harness for open or short between IPDM E/R and battery
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK COOLING FAN MOTOR CIRCUIT

- 1. Disconnect cooling fan motor harness connector.
- Check harness continuity between the following; cooling fan motor terminal 1 and IPDM E/R terminal 5, cooling fan motor terminal 3 and IPDM E/R terminal 15, cooling fan motor terminal 4 and IPDM E/R terminal 12, IPDM E/R terminal 14 and body ground. Refer to wiring diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 4.

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

4. CHECK COOLING FAN MOTOR

Refer to EC-520, "COOLING FAN MOTOR".

OK or NG

OK >> GO TO 5.

NG >> Replace cooling fan motor.

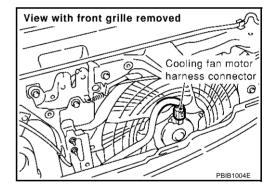
5. CHECK INTERMITTENT INCIDENT

Perform EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

OK or NG

OK >> Replace IPDM E/R. Refer to PG-16, "IPDM E/R (INTELLIGENT POWER DISTRIBUTION MOD-ULE ENGINE ROOM)".

NG >> Repair or replace harness or connector.



[TYPE 1]

PROCEDURE B

1. CHECK COOLING FAN MOTOR CIRCUIT

- 1. Turn ignition switch "OFF".
- 2. Disconnect cooling fan motor harness connector.
- Check harness continuity between the following; cooling fan motor terminal 2 and IPDM E/R terminal 7, cooling fan motor terminal 3 and IPDM E/R terminal 15, cooling fan motor terminal 4 and IPDM E/R terminal 12. Refer to wiring diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 2.

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



Refer to EC-520, "COOLING FAN MOTOR".

OK or NG

OK >> GO TO 3.

NG >> Replace cooling fan motor.

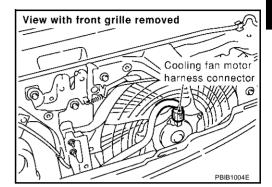
3. CHECK INTERMITTENT INCIDENT

Perform EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> Replace IPDM E/R. Refer to <u>PG-16</u>, "IPDM E/R (INTELLIGENT POWER DISTRIBUTION MOD-<u>ULE ENGINE ROOM)"</u>.

NG >> Repair or replace harness connectors.



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[TYPE 1]

Main 12 Causes of Overheating

BS000F2

Engine	Step	Inspection item	Equipment	Standard	Reference page
OFF	1	Blocked radiatorBlocked condenser	Visual	No blocking	_
		Blocked radiator grille			
		 Blocked bumper 			
	2	Coolant mixture	Coolant tester	50 - 50% coolant mixture	MA-12
	3	Coolant level	Visual	Coolant up to MAX level in reservoir tank and radiator filler neck	CO-11
	4	Radiator cap	Pressure tester	59 - 98 kPa	<u>CO-17</u>
				(0.6 - 1.0 kg/cm ² , 9 - 14 psi) (Limit)	
ON* ²	5	Coolant leaks	Visual	No leaks	<u>CO-11</u>
ON* ²	6	Thermostat	Touch the upper and lower radiator hoses	Both hoses should be hot	<u>CO-30</u>
ON* ¹	7	Cooling fan	CONSULT-II	Operating	See trouble diagnosis for DTC P1217 (<u>EC-509</u>).
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	<u>CO-11</u>
OFF* ⁴	10	Coolant return from reservoir tank to radia- tor	Visual	Should be initial level in reservoir tank	CO-11
OFF	11	Cylinder head	Straight gauge feeler gauge	0.1 mm (0.004 in) Maximum distortion (warping)	EM-89
	12	Cylinder block and pistons	Visual	No scuffing on cylinder walls or piston	<u>EM-103</u>

^{*1:} Turn the ignition switch ON.

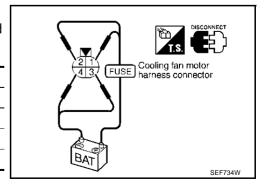
For more information, refer to CO-7, "OVERHEATING CAUSE ANALYSIS" .

Component Inspection COOLING FAN MOTOR

ABS000F3

- 1. Disconnect cooling fan motor harness connectors.
- 2. Supply cooling fan motor terminals with battery voltage and check operation.

	Speed	terminals	
	Opeeu	(+)	(–)
Cooling fan motor	Low	1	3 and 4
	LOW	2	3 and 4
	High	1 and 2	3 and 4



Cooling fan motor should operate.

If NG, replace cooling fan motor.

^{*2:} Engine running at 3,000 rpm for 10 minutes.

^{*3:} Drive at 90 km/h (55 MPH) for 30 minutes and then let idle for 10 minutes.

^{*4:} After 60 minutes of cool down time.

DTC P1223, P1224 TP SENSOR

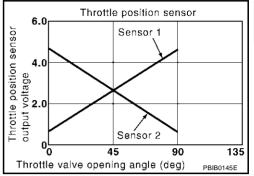
PFP:16119

Component Description

ABS000F4

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 the 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.



CONSULT-II Reference Value in Data Monitor Mode

ABS000F5

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
• Ignition switch: ON	Accelerator pedal: Fully released	More than 0.36V	
THRTL SEN2*	(Engine stopped) ■ Shift lever: D	Accelerator pedal: Fully depressed	Less than 4.75V

^{*:} Throttle position sensor 2 signal is converted by ECM internally. Thus, it differs from ECM terminal voltage signal.

On Board Diagnosis Logic

ABS000F6

These self-diagnoses have the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1223 1223	Throttle position sensor 2 circuit low input	An excessively low voltage from the TP sensor 2 is sent to ECM.	Harness or connectors (The TP sensor 2 circuit is open or
P1224 1224	Throttle position sensor 2 circuit high input	An excessively high voltage from the TP sensor 2 is sent to ECM.	shorted.)Electric throttle control actuator (TP sensor 2)

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Engine operation condition in fail-safe mode

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.

So, the acceleration will be poor.

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DTC Confirmation Procedure

ABS000F7

NOTE:

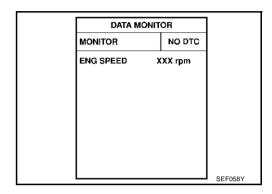
If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

(P) WITH CONSULT-II

- 1. Turn ignition switch "ON".
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- 3. Start engine and let it idle for 1 second.
- 4. If DTC is detected, go to EC-524, "Diagnostic Procedure" .



WITH GST

Follow the procedure "WITH CONSULT-II" above.

Wiring Diagram

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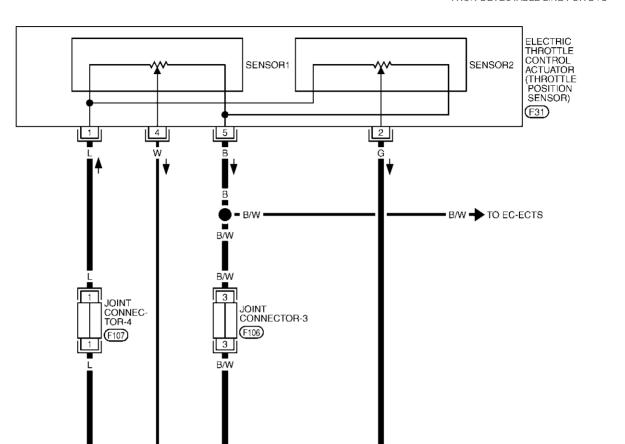
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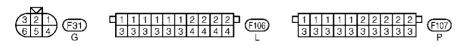
EC-TPS2-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC



84

ECM (F101)



B/W

58

GND-A

83

111



TBWT0150E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)	
			[Engine is running]		
58	B/W	Sensors' ground	Warm-up condition	Approximately 0V	
			Idle speed		
			[Ignition switch "ON"]		
			Engine stopped	More than 0.36V	
			Gear position: "D"	Wiore than 0.30 v	
83	W	Throttle position sensor 1	Accelerator pedal fully released		
03	VV		[Ignition switch "ON"]		
			Engine stopped	1 th 4 75\/	
			Gear position: "D"	Less than 4.75V	
			Accelerator pedal fully depressed		
			[Ignition switch "ON"]		
			Engine stopped	1 th 4 75\/	
			Gear position: "D"	Less than 4.75V	
0.4	0		Accelerator pedal fully released		
84	84 G	Throttle position sensor 2	[Ignition switch "ON"]		
		 Engine stopped Gear position: "D" Accelerator pedal fully depressed 	M (1 0 00)/		
			• Gea	Gear position: "D"	More than 0.36V
			Accelerator pedal fully depressed		
111	L	Sensors' power supply	[Ignition switch "ON"]	Approximately 5V	

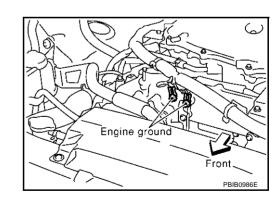
Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

ABS000F9

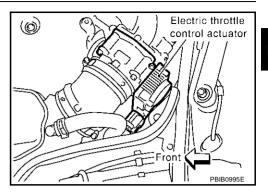
- 1. Turn ignition switch "OFF".
- 2. Loosen and retighten engine ground screws.

>> GO TO 2.



$\overline{2}$. CHECK THROTTLE POSITION SENSOR 2 POWER SUPPLY CIRCUIT

- 1. Disconnect electric throttle control actuator harness connector.
- 2. Turn ignition switch "ON".

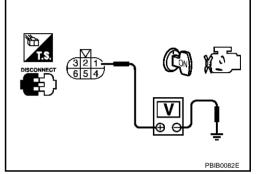


Check voltage between electric throttle control actuator terminal 1 and ground with CONSULT-II or tester.

Voltage: Approximately 5V

OK or NG

OK >> GO TO 4. NG >> GO TO 3.



3. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-4
- Harness for open or short between electric throttle control actuator and ECM
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK THROTTLE POSITION SENSOR 2 GROUND CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch "OFF".
- Check harness continuity between electric throttle control actuator terminal 5 and engine ground. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 6. NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-3
- Harness for open or short between electric throttle control actuator and ECM
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

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6. CHECK THROTTLE POSITION SENSOR 2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Disconnect ECM harness connector.
- 2. Check harness continuity between ECM terminal 84 and electric throttle control actuator terminal 2. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 7.

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

7. CHECK THROTTLE POSITION SENSOR

Refer to EC-526, "Component Inspection".

OK or NG

OK >> GO TO 9. NG >> GO TO 8.

8. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

- 1. Replace the electric throttle control actuator.
- 2. Perform EC-51, "Throttle Valve Closed Position Learning".
- 3. Perform EC-51, "Idle Air Volume Learning".

>> INSPECTION END

9. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

Component Inspection THROTTLE POSITION SENSOR

ABS000FA

- 1. Reconnect all harness connectors disconnected.
- 2. Perform EC-51, "Throttle Valve Closed Position Learning".
- 3. Turn ignition switch "ON".
- 4. Set selector lever to "D" position.
- Check voltage between ECM terminals 83 (TP sensor 1signal), 84 (TP sensor 2signal) and engine ground under the following conditions.

Terminal	Accelerator pedal	Voltage
83	Fully released	More than 0.36V
(Throttle position sensor 1)	Fully depressed	Less than 4.75V
84	Fully released	Less than 4.75V
(Throttle position sensor 2)	Fully depressed	More than 0.36V

- ECM OCONNECTOR

 83 84

 PRIBOSERE
- 6. If NG, replace electric throttle control actuator and go to the next step.
- 7. Perform EC-51, "Throttle Valve Closed Position Learning".
- Perform EC-51, "Idle Air Volume Learning".

DTC P1223, P1224 TP SENSOR

[TYPE 1]

Removal and Installation ELECTRIC THROTTLE CONTROL ACTUATOR

ABS000FB

Refer to EM-18, "INTAKE MANIFOLD COLLECTOR".

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DTC P1225 TP SENSOR

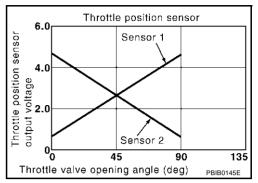
PFP:16119

Component Description

ABS000FC

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 the 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.



On Board Diagnosis Logic

ABS000FD

The MIL will not light up for this diagnosis.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1225 1225	Closed throttle position learning performance problem	Closed throttle position learning value is excessively low.	Electric throttle control actuator (TP sensor 1 and 2)

DTC Confirmation Procedure

ABS000FE

NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

(P) WITH CONSULT-II

- 1. Turn ignition switch "ON".
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- 3. Turn ignition switch "OFF", wait at least 10 seconds.
- 4. Turn ignition switch "ON".
- If 1st trip DTC is detected, go to <u>EC-529, "Diagnostic Procedure"</u>

DATA MONITOR

MONITOR NO DTC

ENG SPEED XXX rpm

SEF058Y

WITH GST

Follow the procedure "WITH CONSULT-II" above.

DTC P1225 TP SENSOR

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Diagnostic Procedure

1. CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

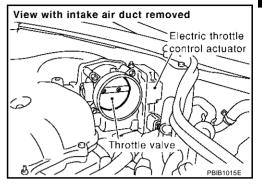
- Turn ignition switch "OFF".
- 2. Remove the intake air duct.
- Check if foreign matter is caught between the throttle valve and the housing.

OK or NG

OK >> GO TO 2.

NG

>> Remove the foreign matter and clean the electric throttle control actuator inside.



2. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

- Replace the electric throttle control actuator.
- 2. Perform EC-51, "Throttle Valve Closed Position Learning".
- 3. Perform EC-51, "Idle Air Volume Learning".

>> INSPECTION END

Removal and Installation **ELECTRIC THROTTLE CONTROL ACTUATOR**

Refer to EM-18, "INTAKE MANIFOLD COLLECTOR".

ABS000FG

DTC P1226 TP SENSOR

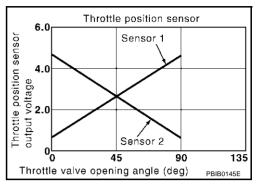
PFP:16119

Component Description

ABS000FH

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 the 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.



On Board Diagnosis Logic

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The MIL will not light up for this diagnosis.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1226 1226	Closed throttle position learning performance problem	Closed throttle position learning is not performed successfully, repeatedly.	Electric throttle control actuator (TP sensor 1 and 2)

DTC Confirmation Procedure

ABS000FJ

NOTE

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

(P) WITH CONSULT-II

- 1. Turn ignition switch "ON".
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- 3. Turn ignition switch "OFF", wait at least 10 seconds.
- 4. Turn ignition switch "ON".
- 5. Repeat steps 3 and 4, 32 times.
- If 1st trip DTC is detected, go to <u>EC-531</u>, "<u>Diagnostic Procedure</u>"

DATA MONITOR

MONITOR NO DTC

ENG SPEED XXX rpm

SEF058Y

WITH GST

Follow the procedure "With CONSULT-II" above.

DTC P1226 TP SENSOR

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Diagnostic Procedure

1. CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

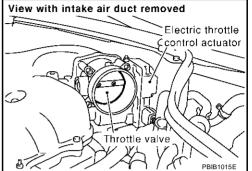
- Turn ignition switch "OFF".
- 2. Remove the intake air duct.
- Check if foreign matter is caught between the throttle valve and the housing.

OK or NG

OK >> GO TO 2.

NG

>> Remove the foreign matter and clean the electric throttle control actuator inside.



2. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

- Replace the electric throttle control actuator.
- 2. Perform EC-51, "Throttle Valve Closed Position Learning".
- 3. Perform EC-51, "Idle Air Volume Learning".

>> INSPECTION END

Removal and Installation **ELECTRIC THROTTLE CONTROL ACTUATOR**

Refer to EM-18, "INTAKE MANIFOLD COLLECTOR".

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DTC P1227, P1228 APP SENSOR

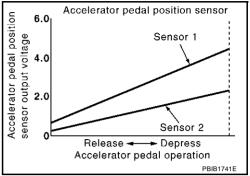
PFP:18002

Component Description

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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 potentiometers 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 feed 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 the engine oper-

CONSULT-II Reference Value in Data Monitor Mode

ABS000NT

Specification data are reference values.

ation such as fuel cut.

MONITOR ITEM	CONDITION		SPECIFICATION
ACCEL SEN1	Ignition switch: ON	Accelerator pedal: Fully released	0.41 - 0.72V
ACCEL SENT	(Engine stopped)	Accelerator pedal: Fully depressed	More than 3.2V
ACCEL SEN2*	Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.15 - 0.98V
ACCEL SENZ		Accelerator pedal: Fully depressed	More than 2.98V
CLSD THL POS	Ignition switch: ON	Accelerator pedal: Fully released	ON
	(Engine stopped)	Accelerator pedal: Slightly depressed	OFF

^{*:} Accelerator pedal position sensor 2 signal is converted by ECM internally. Thus, it differs from ECM terminal voltage signal.

On Board Diagnosis Logic

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These self-diagnoses have the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1227 1227	Accelerator pedal position sensor 2 circuit low input	An excessively low voltage from the APP sensor 2 is sent to ECM.	Harness or connectors (The APP sensor 2 circuit is open or shorted.)
P1228 1228	Accelerator pedal position sensor 2 circuit high input	An excessively high voltage from the APP sensor 2 is sent to ECM.	,

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Engine operating condition in fail-safe mode

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.

So, the acceleration will be poor.

DTC P1227, P1228 APP SENSOR

[TYPE 1]

DTC Confirmation Procedure

ABS000FP

NOTE:

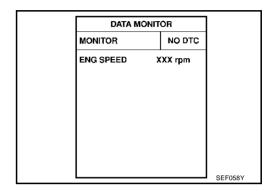
If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

(II) WITH CONSULT-II

- 1. Turn ignition switch "ON".
- Select "DATA MONITOR" mode with CONSULT-II.
- 3. Start engine and let it idle for 1 second.
- 4. If DTC is detected, go to EC-535, "Diagnostic Procedure" .



® WITH GST

Follow the procedure "With CONSULT-II" above.

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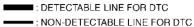
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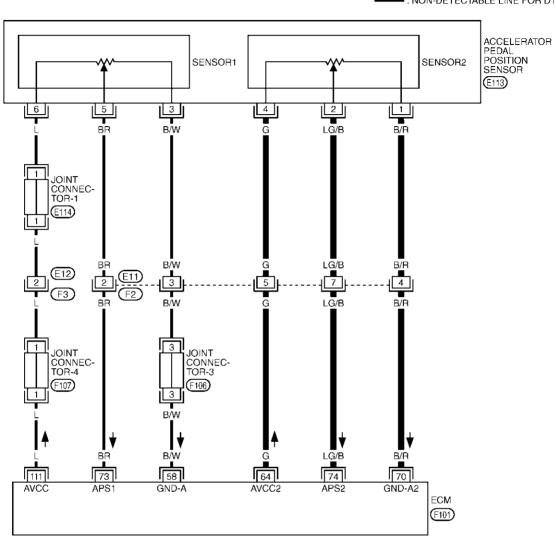
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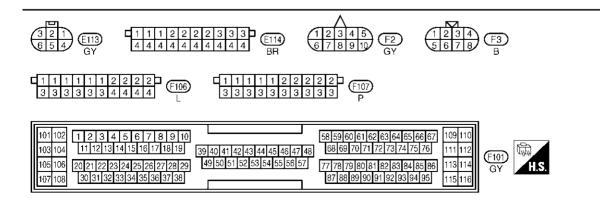
Wiring Diagram

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EC-APPS2-01







TBWT0153E

DTC P1227, P1228 APP SENSOR

[TYPE 1]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

				<u> </u>
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
58	B/W	Sensors' ground	[Engine is running]Warm-up conditionIdle speed	Approximately 0V
64	G	Accelerator pedal position sensor 2 power supply	[Ignition switch "ON"]	Approximately 2.5V
70	B/R	Accelerator pedal position sensor 2 ground	[Ignition switch "ON"]	Approximately 0V
73	BR	Accelerator pedal position sensor 1	 [Ignition switch "ON"] Engine stopped Accelerator pedal fully released [Ignition switch "ON"] Engine stopped Accelerator pedal fully depressed 	0.41 - 0.72V More than 3.2V
74	LG/B	Accelerator pedal position sensor 2	 [Ignition switch "ON"] Engine stopped Accelerator pedal fully released [Ignition switch "ON"] Engine stopped Accelerator pedal fully depressed 	0.07 - 0.49V More than 1.49V
111	L	Sensors' power supply	[Ignition switch "ON"]	Approximately 5V

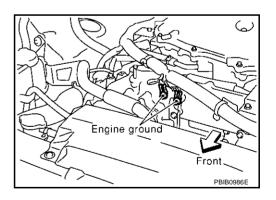
Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

1. Turn ignition switch "OFF".

2. Loosen and retighten engine ground screws.

>> GO TO 2.



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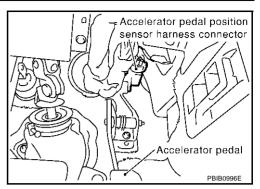
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$\overline{2}$. CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT

- Disconnect accelerator pedal position (APP) sensor harness connector.
- 2. Turn ignition switch "ON".

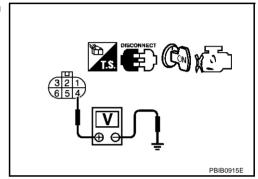


Check voltage between APP sensor terminal 4 and ground with CONSULT-II or tester.

Voltage: Approximately 2.5V

OK or NG

OK >> GO TO 4. NG >> GO TO 3.



3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E11, F2
- Harness for open or short between ECM and accelerator pedal position sensor
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK APP SENSOR 2 GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch "OFF".
- Check harness continuity between APP sensor terminal 1 and engine ground. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 6. NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E11, F2
- Harness for open or short between ECM and accelerator pedal position sensor
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

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6. CHECK APP SENSOR 2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Disconnect ECM harness connector.
- Check harness continuity between ECM terminal 74 and APP sensor terminal 2. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 8. NG >> GO TO 7.

7. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E11, F2
- Harness for open or short between ECM and accelerator pedal position sensor

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

8. CHECK APP SENSOR

Refer to EC-537, "Component Inspection".

OK or NG

OK >> GO TO 9.

NG >> Replace accelerator pedal assembly.

9. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

Component Inspection ACCELERATOR PEDAL POSITION SENSOR

- 1. Reconnect all harness connectors disconnected.
- Turn ignition switch "ON".
- Check voltage between ECM terminals 73 (APP sensor 1 signal), 74 (APP sensor 2 signal) and engine ground under the following conditions.

Terminal	Accelerator pedal	Voltage
73	Fully released	0.41 - 0.72V
(Accelerator pedal position sensor 1)	Fully depressed	More than 3.2V
74	Fully released	0.07 - 0.49V
(Accelerator pedal position sensor 2)	Fully depressed	More than 1.49V

CONNECTOR ECM SEC901C

- If NG, replace accelerator pedal assembly.
- Perform EC-51, "Accelerator Pedal Released Position Learning". 5.
- Perform EC-51, "Throttle Valve Closed Position Learning".
- Perform EC-51, "Idle Air Volume Learning".

Removal and Installation ACCELERATOR PEDAL

Refer to ACC-4, "ACCELERATOR CONTROL SYSTEM".

EC-537 Revision; 2004 April 2003 G35 Sedan

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[TYPE 1]

DTC P1229 SENSOR POWER SUPPLY

On Board Diagnosis Logic

PFP:16119

ABS000FU

This self-diagnosis has the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1229 1229	Sensor power supply circuit short	ECM detects a voltage of power source for sensor is excessively low or high.	 Harness or connectors (The TP sensor 1 and 2 circuit is shorted.) (APP sensor 1 circuit is shorted.) (MAF sensor circuit is shorted.) (EVAP control system pressure sensor circuit is shorted.) (Power steering pressure sensor circuit is shorted.) (Refrigerant pressure sensor circuit is shorted.) (Refrigerant pressure sensor circuit is shorted.) Electric throttle control actuator (TP sensor 1 and 2) Accelerator pedal position sensor (APP sensor 1) MAF sensor EVAP control system pressure sensor Power steering pressures sensor Refrigerant pressures sensor ECM pin terminal

FAIL-SAFE MODE

When the malfunction is detected, ECM enters in fail-safe mode and the MIL lights up.

Engine operation condition in fail-safe mode

ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.

DTC Confirmation Procedure

ABS000FV

NOTE:

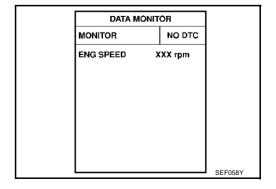
If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

(II) WITH CONSULT-II

- 1. Turn ignition switch "ON".
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- 3. Start engine and let it idle for 1 second.
- 4. If DTC is detected, go to EC-540, "Diagnostic Procedure".



WITH GST

Follow the procedure "WITH CONSULT-II" above.

Wiring Diagram

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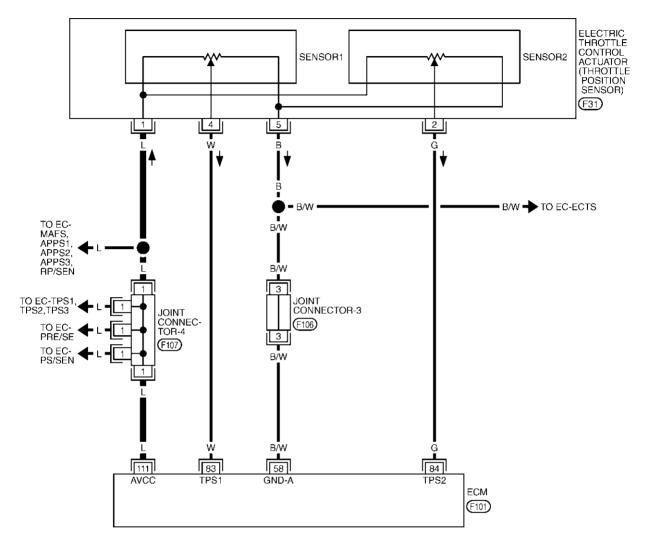
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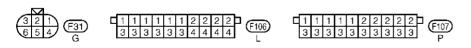
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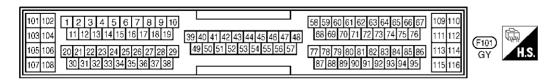
EC-SEN/PW-01

■ : DETECTABLE LINE FOR DTC

: NON-DETECTABLE LINE FOR DTC







TBWT0171E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
111	L	Sensors' power supply	[Ignition switch "ON"]	Approximately 5V

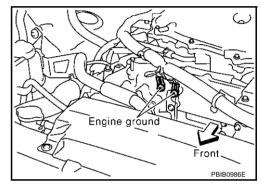
Diagnostic Procedure

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1. RETIGHTEN GROUND SCREWS

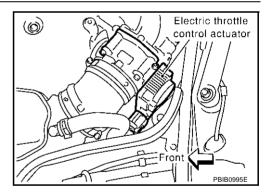
- 1. Turn ignition switch "OFF".
- 2. Loosen and retighten engine ground screws.

>> GO TO 2.



2. CHECK THROTTLE POSITION SENSOR POWER SUPPLY CIRCUIT

- 1. Disconnect electric throttle control actuator harness connector.
- 2. Turn ignition switch "ON".

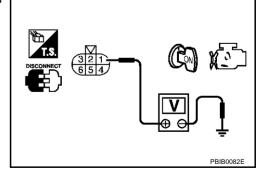


3. Check voltage between electric throttle control actuator terminal 1 and ground with CONSULT-II or tester.

Voltage: Approximately 5V

OK or NG

OK >> GO TO 5. NG >> GO TO 3.



DTC P1229 SENSOR POWER SUPPLY

[TYPE 1]

$\overline{3}$. CHECK SENSOR POWER SUPPLY CIRCUITS

Check the following.

Harness for short to power and short to ground, between the following terminals.

ECM terminal	Sensor terminals	Reference Wiring Diagram
	Electric throttle control actuator terminal 1	EC-539
	APP sensor terminal 6	EC-534
111	MAF sensor terminal 2	EC-180
111	EVAP control system pressure sensor terminal 3	EC-381
	Power steering pressure sensor terminal 1	EC-430
	Refrigerant pressure sensor terminal 1	EC-618

ECM pin terminal.

OK or NG

OK >> GO TO 4.

NG >> Repair short to ground or short to power in harness or connectors.

4. CHECK COMPONENTS

Check the following.

- Accelerator pedal position sensor (Refer to EC-537 "Component Inspection".)
- Mass air flow sensor (Refer to EC-176 "Component Inspection".)
- EVAP control system pressure sensor (Refer to EC-384 "Component Inspection".)
- Power steering pressure sensor (Refer to EC-433 "Component Inspection".)

OK or NG

OK >> GO TO 7.

NG >> Replace malfunctioning component.

5. CHECK THROTTLE POSITION SENSOR

Refer to EC-295 "Component Inspection".

OK or NG

OK >> GO TO 7.

NG >> GO TO 6.

6. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

- 1. Replace electric throttle control actuator.
- 2. Perform EC-51, "Throttle Valve Closed Position Learning".
- 3. Perform EC-51, "Idle Air Volume Learning".

>> INSPECTION END

7. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

EC-541 2003 G35 Sedan Revision; 2004 April

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DTC P1444 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE ITYPE 11

DTC P1444 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

PFP:14920

Description SYSTEM DESCRIPTION

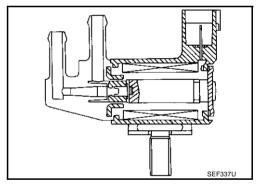
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Sensor	Input Signal to ECM	ECM function	Actuator	
Crankshaft position sensor (POS) Camshaft position sensor (PHASE)	Engine speed			
Mass air flow sensor	Amount of intake air			
Engine coolant temperature sensor	Engine coolant temperature			
Ignition switch	Start signal			
Throttle position sensor	Throttle position	EVAP canister	EVAP canister purge vol-	
Accelerator pedal position switch	Accelerator pedal position	purge flow control	ume control solenoid valve	
Heated oxygen sensors 1	Density of oxygen in exhaust gas (Mixture ratio feedback signal)			
Fuel tank temperature sensor	Fuel temperature in fuel tank			
Vehicle speed signal (CAN communication line)	Vehicle speed			

This system controls flow rate of fuel vapor from the EVAP canister. The opening of the vapor by-pass passage in the EVAP canister purge volume control solenoid valve changes to control the flow rate. The EVAP canister purge volume control solenoid valve repeats ON/OFF operation according to the signal sent from the ECM. The opening of the valve varies for optimum engine control. The optimum value stored in the ECM is determined by considering various engine conditions. When the engine is operating, the flow rate of fuel vapor from the EVAP canister is regulated as the air flow changes.

COMPONENT DESCRIPTION

The EVAP canister purge volume control solenoid valve uses a ON/ OFF duty 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.



CONSULT-II Reference Value in Data Monitor Mode

ABS000FZ

Specification data are reference values.

MONITOR ITEM	CON	SPECIFICATION	
	Engine: After warming up	Idle	0%
PURG VOL C/V	Shift lever: NAir conditioner switch: OFFNo-load	2,000 rpm	_

DTC P1444 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE [TYPE 1]

On Board Diagnosis Logic

ABS000G0

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	_
P1444 1444	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 	E
			Hoses (Hoses are connected incorrectly or clogged.)	ı

DTC Confirmation Procedure

ABS000G1

NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Always perform test at a temperature of 5°C (41°F) or more.

WITH CONSULT-II

- 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". 3.
- Select "PURG VOL CN/V P1444" of "EVAPORATIVE SYSTEM" in "DTC WORK SUPPORT" mode with CONSULT-II.
- Touch "START".

PURG VOL CN/V	P1444	PURG VOL CN/V	P1444		PURG VOL CN/V P1444	
OUT OF CONDITION		TESTING				
MONITOR		MONITOR		•	COMPLETED	
ENG SPEED	XXX rpm	ENG SPEED	XXX rpm	•		
B/FUEL SCHDL	XXX msec	B/FUEL SCHDL	XXX msec			
COOLAN TEMP/S	xxx.c	COOLAN TEMP/S	xxx °c			
VHCL SPEED SE	XXX km/h	VHCL SPEED SE	XXX km/h			PBIB0839E

Start engine and let it idle until "TESTING" on CONSULT-II changes to "COMPLETED". (It will take approximately 10 seconds.)

If "TESTING" is not displayed after 5 minutes, retry from step 2.

7. Make sure that "OK" is displayed after touching "SELF-DIAG RESULTS". If "NG" is displayed, refer to EC-545, "Diagnostic Procedure"

® WITH GST

- 1. Start engine and warm it up to normal operating temperature.
- Turn ignition switch "OFF" and wait at least 10 seconds.
- 3. Start engine and let it idle for at least 20 seconds.
- 4. Select "MODE 7" with GST.
- 5. If 1st trip DTC is detected, go to EC-545, "Diagnostic Procedure".

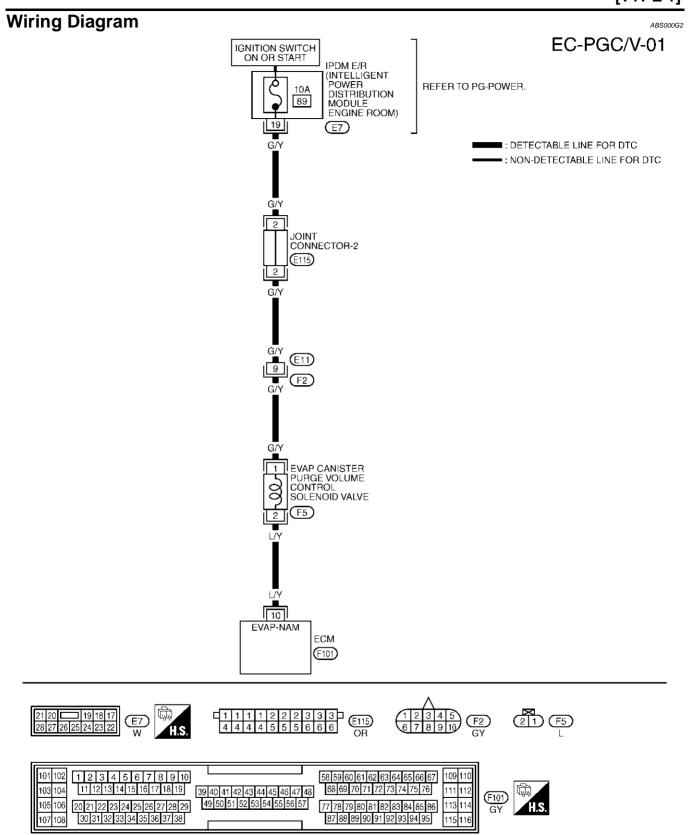
EC-543 Revision; 2004 April 2003 G35 Sedan

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DTC P1444 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE [TYPE 1]



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DTC P1444 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE [TYPE 1]

Specification data are reference values and are measured between each terminal and ground. Pulse signal is measured by CONSULT-II.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
10	LY	EVAP canister purge volume control solenoid valve	[Engine is running] • Idle speed	BATTERY VOLTAGE (11 - 14V)*
10			 [Engine is running] ● Engine speed is about 2,000 rpm (More than 100 seconds after starting engine). 	BATTERY VOLTAGE (11 - 14V)*

^{★:} Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

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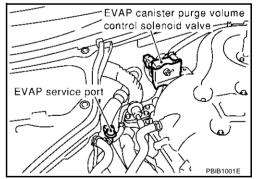
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1. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE POWER SUPPLY CIR-CUIT

- 1. Turn ignition switch "OFF".
- Disconnect EVAP canister purge volume control solenoid valve harness connector.
- Turn ignition switch "ON".

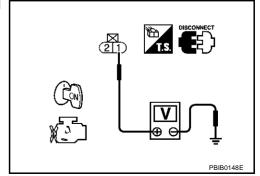


4. Check voltage between EVAP canister purge volume control solenoid valve terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 3. NG >> GO TO 2.



Revision; 2004 April EC-545 2003 G35 Sedan

$\overline{2}$. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E11, F2
- Joint connector-2
- IPDM E/R harness connector E7
- 10A fuse
- Harness for open or short between EVAP canister purge volume control solenoid valve and IPDM E/R
 - >> Repair harness or connectors.

3. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OUTPUT SIGNAL CIR-CUIT FOR OPEN AND SHORT

- 1. Turn ignition switch "OFF".
- 2. Disconnect ECM harness connector.
- 3. Check harness continuity between ECM terminal 10 and EVAP canister purge volume control solenoid valve terminal 2. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 4.

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

4. 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.

OK or NG

OK >> GO TO 5.

NG >> Replace EVAP control system pressure sensor.

5. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-384, "Component Inspection".

OK or NG

OK (With CONSULT-II)>>GO TO 6.

OK (Without CONSULT-II)>>GO TO 7.

NG >> Replace EVAP control system pressure sensor.

DTC P1444 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

6. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

(P) With CONSULT-II

- 1. Turn ignition switch "OFF".
- 2. Reconnect harness connectors disconnected.
- 3. Start engine.
- 4. Perform "PURG VOL CONT/V" in "ACTIVE TEST" mode with CONSULT-II. Check that engine speed varies according to the valve opening.

OK or NG

OK >> GO TO 8. NG >> GO TO 7.

ACTIVE TES	ACTIVE TEST			
PURG VOL CONT/V	IG VOL CONT/V 0 %			
MONITOR				
ENG SPEED	XXX rpm			
HO2S1 MNTR (B1)	LEAN			
HO2S1 MNTR (B2)	LEAN			
A/F ALPHA-B1	XXX %			
A/F ALPHA-B2	XXX %			

7. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-548, "Component Inspection".

OK or NG

OK >> GO TO 8.

NG >> Replace EVAP canister purge volume control solenoid valve.

8. CHECK RUBBER TUBE FOR CLOGGING

- Disconnect rubber tube connected to EVAP canister vent control valve.
- 2. Check the rubber tube for clogging.

OK or NG

OK >> GO TO 9.

NG >> Clean the rubber tube using an air blower.

9. CHECK EVAP CANISTER VENT CONTROL VALVE

Refer to EC-374, "Component Inspection".

OK or NG

OK >> GO TO 10.

NG >> Replace EVAP canister vent control valve.

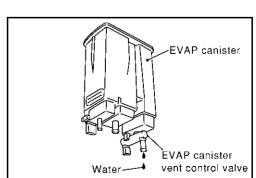
$10.\,$ check if evap canister saturated with water

- Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
- Check if water will drain from the EVAP canister.

OK or NG

OK >> GO TO 11.

NG >> GO TO 14.



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DTC P1444 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

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).

OK or NG

OK >> GO TO 13. NG >> GO TO 12.

12. DETECT MALFUNCTIONING PART

Check the following.

- EVAP canister for damage
- EVAP hose between EVAP canister and water separator for clogging or poor connection
 - >> Repair hose or replace EVAP canister.

13. CHECK WATER SEPARATOR

Refer to EC-362, "Component Inspection".

OK or NG

OK >> GO TO 14.

NG >> Clean or replace water separator.

14. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

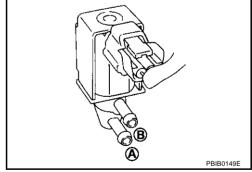
Component Inspection EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

ABS000G4

(P) With CONSULT-II

Check air passage continuity of EVAP canister purge volume control solenoid valve under the following conditions.

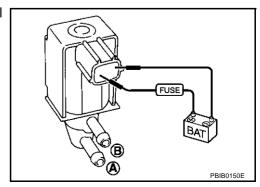
Condition (PURG VOL CONT/V value)	Air passage continuity between A and B
100%	Yes
0%	No



Without CONSULT-II

Check air passage continuity of EVAP canister purge volume control solenoid valve under the following conditions.

Condition	Air passage continuity between A and B
12V direct current supply between terminals 1 and 2	Yes
No supply	No



DTC P1444 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE [TYPE 1]

Removal and Installation EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EM-18, "INTAKE MANIFOLD COLLECTOR".

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DTC P1446 EVAP CANISTER VENT CONTROL VALVE

PFP:14935

Component Description

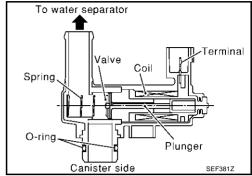
ABS000G6

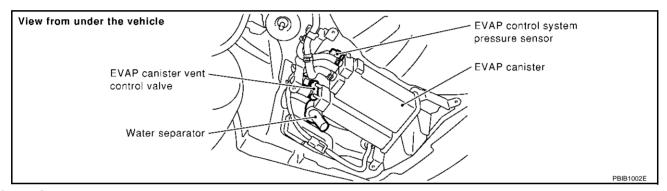
The EVAP canister vent control valve is located on the EVAP canister and is used to seal the canister vent.

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.





CONSULT-II Reference Value in Data Monitor Mode

ABS000G7

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
VENT CONT/V	Ignition switch: ON	OFF

On Board Diagnosis Logic

ABS000G8

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1446 1446	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
			Water separator
			EVAP canister is saturated with water

DTC P1446 EVAP CANISTER VENT CONTROL VALVE

[TYPE 1]

DTC Confirmation Procedure

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NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

(P) WITH CONSULT-II

- 1. Turn ignition switch "ON" and wait at least 5 seconds.
- 2. Turn ignition switch "OFF" and wait at least 10 seconds.
- 3. Turn ignition switch "ON" and select "DATA MONITOR" mode with CONSULT-II.
- 4. Start engine and let it idle for at least 1 minute.
- Repeat next procedures 3 times.
- a. Increase the engine speed up to 3,000 to 3,500 rpm and keep it for 2 minutes and 50 seconds to 3 minutes.

Never exceed 3 minutes.

- b. Fully released accelerator pedal and keep engine idle for about 5 seconds.
- 6. If 1st trip DTC is detected, go to EC-553, "Diagnostic Procedure"

DATA MONITOR

MONITOR

NO DTC

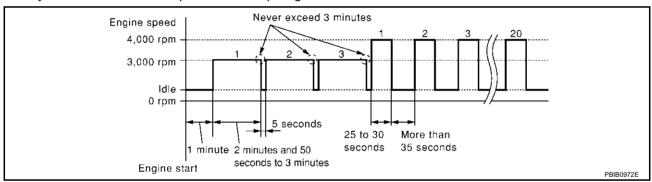
ENG SPEED XXXX rpm

SEF058Y

If 1st trip DTC is not detected, go to the next step.

7. Repeat next procedure 20 times.

- a. Quickly increase the engine speed up to 4,000 to 4,500 rpm or more and keep it for 25 to 30 seconds.
- Fully released accelerator pedal and keep engine idle for at least 35 seconds.



If 1st trip DTC is detected, go to <u>EC-553, "Diagnostic Procedure"</u>.

WITH GST

Follow the procedure "WITH CONSULT-II" above.

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[TYPE 1]

Wiring Diagram EC-VENT/V-01 IGNITION SWITCH ON OR START IPDM E/R (INTELLIGENT POWER REFER TO PG-POWER. DISTRIBUTION 89 MODULE ENGINE ROOM) ■ : DETECTABLE LINE FOR DTC (E7) : NON-DETECTABLE LINE FOR DTC G/Y 2 JOINT CONNECTOR-2 (E115) G/Y 9 G/Y 15H G/Y 49J G/Y **E11** (F2) (F102) (M72)M12(B1) (B108) (B201) EVAP CANISTER VENT CONTROL VALVE (B201) (B108) (B1) 35J (M12) GY/L 26H (M72) GY/L (F102) CDCV ЕСМ (F101) REFER TO THE FOLLOWING. (F102), (B1) -SUPER MULTIPLE 19 18 17 26 25 24 23 22 (E7) (F2) JUNCTION (SMJ) 2 1 B203 1 2 3 4 5 6 7 8 9 10 58 59 60 61 62 63 64 65 66 67 103 104 11 12 13 14 15 16 17 18 19 68 69 70 71 72 73 74 75 76 111 112 39 40 41 42 43 44 45 46 47 48 (F101) 105 106 49 50 51 52 53 54 55 56 57 113 114 20 21 22 23 24 25 26 27 28 29 77 78 79 80 81 82 83 84 85 86 GY 107 108 87 88 89 90 91 92 93 94 95

TBWT0159E

DTC P1446 EVAP CANISTER VENT CONTROL VALVE

[TYPE 1]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

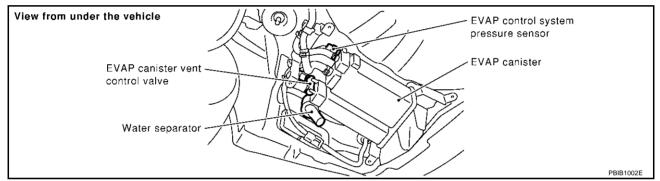
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
105	GY/L	EVAP canister vent control valve	[Ignition switch "ON"]	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

ABS000GB

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.

OK or NG

OK >> GO TO 2.

NG >> Clean rubber tube using an air blower.

2. CHECK WATER SEPARATOR

Refer to EC-362, "Component Inspection".

OK or NG

OK >> GO TO 3.

NG >> Clean or replace water separator.

3. CHECK EVAP CANISTER VENT CONTROL VALVE

Refer to EC-555, "EVAP CANISTER VENT CONTROL VALVE".

OK or NG

OK >> GO TO 4.

NG >> Replace EVAP canister vent control valve.

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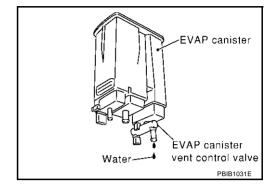
1\/

4. CHECK IF EVAP CANISTER 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.

OK or NG

OK >> GO TO 5. NG >> GO TO 7.



5. 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).

OK or NG

OK >> GO TO 7. NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- EVAP canister for damage
- EVAP hose between EVAP canister and water separator for clogging or poor connection
 - >> Repair hose or replace EVAP canister.

7. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR CONNECTOR

- 1. Disconnect EVAP control system pressure sensor harness connector.
- Check connectors for water.

Water should not exist.

OK or NG

OK >> GO TO 8.

NG >> Replace EVAP control system pressure sensor.

8. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-384, "Component Inspection".

OK or NG

OK >> GO TO 9.

NG >> Replace EVAP control system pressure sensor.

9. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

[TYPE 1]

Component Inspection EVAP CANISTER VENT CONTROL VALVE

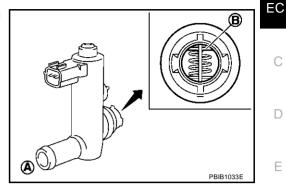
ABS000GC

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(P) With CONSULT-II

- 1. Remove EVAP canister vent control valve from EVAP canister.
- Check portion **B** of EVAP canister vent control valve for being rusted.
 - If NG, replace EVAP canister vent control valve. If OK, go to next step.
- 3. Reconnect harness connectors disconnected.
- Turn ignition switch "ON".



- 5. Perform "VENT CONTROL/V" in "ACTIVE TEST" mode.
- Check air passage continuity and operation delay time. Make sure new O-ring is installed properly.

Condition VENT CONTROL/V	Air passage continuity between A and B
ON	No
OFF	Yes

Operation takes less than 1 second.

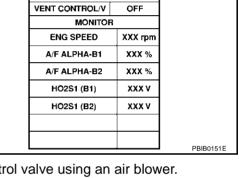
If NG, replace EVAP canister vent control valve.

If OK, go to next step.

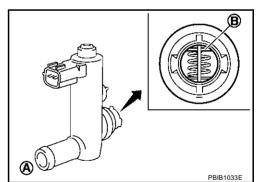
- 7. Clean the air passage (Portion A to B) of EVAP canister vent control valve using an air blower.
- 8. Perform step 6 again.

⋈ Without CONSULT-II

- Remove EVAP canister vent control valve from EVAP canister.
- Check portion **B** of EVAP canister vent control valve for being rusted.



ACTIVE TEST



Check air passage continuity and operation delay time under the following conditions.

Make sure new O-ring is installed properly.

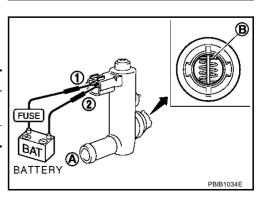
Condition	Air passage continuity between A and B
12V direct current supply between terminals 1 and 2	No
OFF	Yes

Operation takes less than 1 second.

If NG, replace EVAP canister vent control valve.

If OK, go to next step.

Clean the air passage (Portion A to B) of EVAP canister vent control valve using an air blower.



EC-555 Revision; 2004 April 2003 G35 Sedan

DTC P1446 EVAP CANISTER VENT CONTROL VALVE

[TYPE 1]

5. Perform step 3 again.

[TYPE 1]

DTC P1464 FUEL LEVEL SENSOR

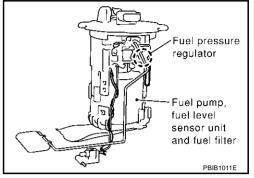
PFP:25060

Component Description

ABSOOGD

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

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.



On Board Diagnosis Logic

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ECM receives two signals from the fuel level sensor.

One is fuel level sensor power supply circuit, and the other is fuel level sensor ground circuit.

This diagnosis indicates the latter to detect open circuit malfunction.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1464 1464	Fuel level sensor circuit ground signal	A high voltage from the sensor is sent to ECM.	Harness or connectors (The sensor circuit is open or shorted)

DTC Confirmation Procedure

ABSOOGE

NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

(A) WITH CONSULT-II

- Turn ignition switch "ON". 1.
- Select "DATA MONITOR" mode with CONSULT-II.
- 3. Wait at least 5 seconds.
- If 1st trip DTC is detected, go to EC-559, "Diagnostic Procedure"

DATA MON	IITOR	
MONITOR	NO DTC	
FUELT/TMP SE FUEL LEVEL SE	XXX A	
		SEF195Y

® WITH GST

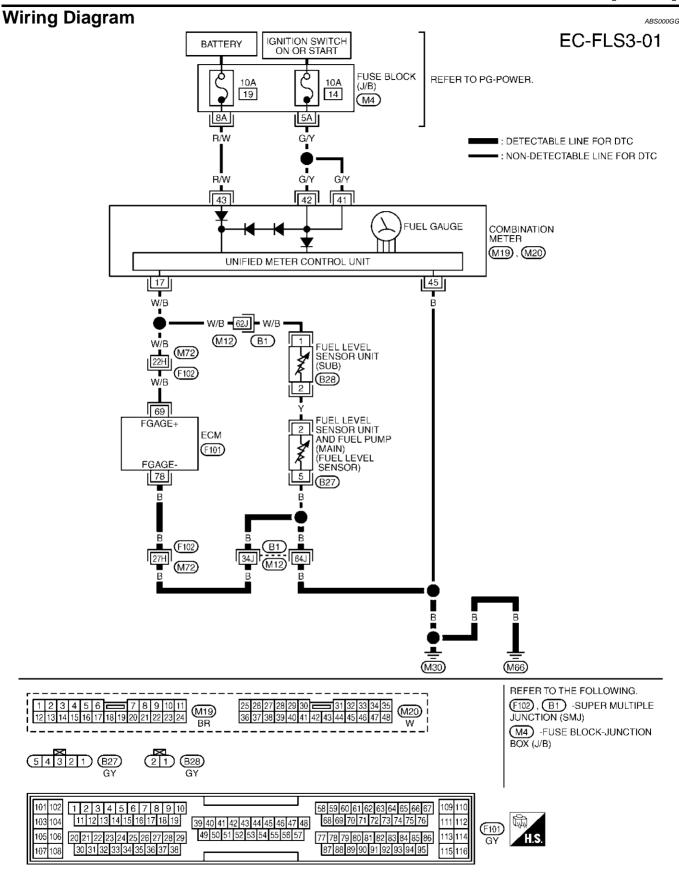
Follow the procedure "WITH CONSULT-II" above.

EC-557 Revision; 2004 April 2003 G35 Sedan

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TBWT0163E

DTC P1464 FUEL LEVEL SENSOR

[TYPE 1]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
69	W/B	Fuel level sensor	[Ignition switch "ON"]	Approximately 0 - 4.8V Output voltage varies with fuel level.
78	В	Fuel level sensor ground	[Engine is running] • Idle speed	Approximately 0V

Diagnostic Procedure

ABS000GH

1. CHECK FUEL LEVEL SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch "OFF".
- 2. Disconnect ECM harness connector.
- Check harness continuity between ECM terminal 78 and ground. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to power.

OK or NG

OK >> GO TO 3. NG >> GO TO 2.

2. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F102, M72
- Harness connectors M12, B1
- Harness for open and short between ECM and ground

>> Replace open circuit or short to power in harness or connectors.

3. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

ABS000GI

>> INSPECTION END

Removal and Installation FUEL LEVEL SENSOR

Refer to FL-5, "Removal and Installation".

Revision; 2004 April EC-559 2003 G35 Sedan

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DTC P1564 ASCD STEERING SWITCH

Component Description

PFP:25551

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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 <u>EC-650</u>, "AUTOMATIC SPEED CONTROL DEVICE (ASCD)" for the ASCD function.



CONSULT-II Reference Value in Data Monitor Mode

ABS000OA

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
MAINLOW.	1 22 21 01	CRUISE switch: Pressed	ON
MAIN SW	Ignition switch: ON	CRUISE switch: Released	OFF
CANCEL SW • Ignition sw	- Ignition quitable ON	CANCEL switch: Pressed	ON
	Ignition switch: ON	CANCEL switch: Released	OFF
DECLINE A CO CIA	. In this control of the control of	ACCEL/RES switch: Pressed	ON
RESUME/ACC SW	Ignition switch: ON	ACCEL/RES switch: Released	OFF
OFT OW	• Ignition switch: ON	COAST/SET switch: Pressed	ON
SET SW		COAST/SET switch: Released	OFF

On Board Diagnosis Logic

ABS000GL

The MIL will not light up for this diagnosis.

NOTF:

If DTC P1564 is displayed with DTC P0605, first perform the trouble diagnosis for DTC P0605. Refer to <u>EC-434</u>.

DTC No.	Trouble Diagnosis Name	DTC Detecting Condition	Possible Cause
P1564 1564	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 P1564 ASCD STEERING SWITCH

[TYPE 1]

DTC Confirmation Procedure

ABS000GM

NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

(P) WITH CONSULT-II

- Turn ignition switch "ON".
- Select "DATA MONITOR" mode with CONSULT-II.
- Wait at least 10 seconds.
- Press "CRUISE" switch for at least 10 seconds, then release it and wait at least 10 seconds.
- Press "ACCEL/RES" switch for at least 10 seconds, then release it and wait at least 10 seconds.
- Press "COAST/SET" 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.
- If 1st trip DTC is detected, go to EC-564, "Diagnostic Procedure".

WITH GST

Follow the procedure "WITH CONSULT-II" above.

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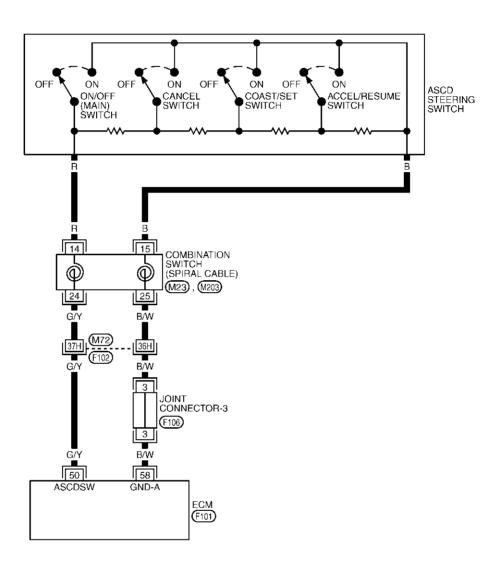
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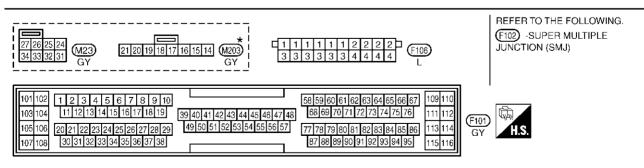
Wiring Diagram

RSOOGN

EC-ASC/SW-01







*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TBWT0172E

DTC P1564 ASCD STEERING SWITCH

[TYPE 1]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
			[Ignition switch "ON"] • ASCD steering switch is released.	Approximately 4V
			[Ignition switch "ON"] • CRUISE switch is pressed.	Approximately 0V
50	50 G/Y ASCD steering switch	[Ignition switch "ON"] • CANCEL switch is pressed.	Approximately 1V	
			[Ignition switch "ON"] • COAST/SET switch is pressed.	Approximately 2V
			[Ignition switch "ON"] • ACCEL/RESUME switch is pressed.	Approximately 3V
58	B/W	Sensors' ground	[Engine is running] • Warm-up condition • Idle speed	Approximately 0V

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Diagnostic Procedure

1. CHECK ASCD STEERING SWITCH CIRCUIT

(P) With CONSULT-II

- 1. Turn ignition switch "ON".
- 2. Select "MAIN SW", "RESUME/ACC SW", "SET SW" and "CANCEL SW" in "DATA MONITOR" mode with CONSULT-II.
- 3. Check each item indication under the following conditions.

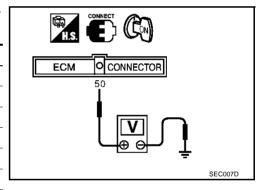
Switch	Monitor item	Condition	Indication
CRUISE	MAIN SW	Pressed	ON
ONOIGE	WAIN OW	Released	OFF
COAST/SET SET SW		Pressed	ON
COAST/SET	SET SW	Released	OFF
ACCEL/RES RESUME/ACC SW		Pressed	ON
ACCEL/NES	ACCEL/RES RESUME/ACC SW		OFF
CANCEL	CANCEL SW	Pressed	ON
CANGLE	CANCLL SW	Released	OFF

DATA MONIT	r O R	
MONITOR	NO DTC	
MAIN SW	OFF	
CANCEL SW	OFF	
RESUME/ACC SW	OFF	
SET SW	OFF	
		SEC006

⋈ Without CONSULT-II

- 1. Turn ignition switch "ON".
- 2. Check voltage between ECM terminal 50 and ground with pressing each button.

Condition	Voltage [V]
Pressed	Approx. 0
Released	Approx. 4
Pressed	Approx. 2
Released	Approx. 4
Pressed	Approx. 3
Released	Approx. 4
Pressed	Approx. 1
Released	Approx. 4
	Pressed Released Pressed Released Pressed Pressed Released Pressed



OK or NG

OK >> GO TO 7. NG >> GO TO 2.

2. Check ascd steering switch ground circuit for open and short

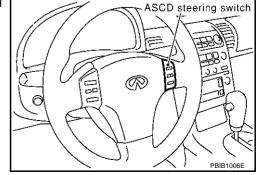
- 1. Turn ignition switch "OFF".
- 2. Disconnect combination switch harness connector M203.
- 3. Check harness continuity between combination switch terminal 15 and ground. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to power.

OK or NG

OK >> GO TO 4. NG >> GO TO 3.



DTC P1564 ASCD STEERING SWITCH

[TYPE 1]

$\overline{3}$. DETECT MALFUNCTIONING PART Check the following. Harness connectors M72, F102 EC Joint connector-3 Combination switch (spiral cable) Harness for open and short between ECM and combination switch >> Repair open circuit or short to power in harness or connectors. D 4. CHECK ASCD STEERING SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT Disconnect ECM harness connector. 1. F Check harness continuity between ECM terminal 50 and combination switch terminal 14. Refer to Wiring Diagram. Continuity should exist. 3. Also check harness for short to ground and short to power. OK or NG >> GO TO 6. OK >> GO TO 5. NG 5. DETECT MALFUNCTIONING PART Check the following. Harness connectors M72, F102 Combination switch (spiral cable) Harness for open and short between ECM and combination switch >> Repair open circuit or short to ground or short to power in harness or connectors. 6. CHECK ASCD STEERING SWITCH Refer to EC-565, "Component Inspection". OK or NG >> GO TO 7. OK NG >> Replace steering wheel. /. CHECK INTERMITTENT INCIDENT M Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT". >> INSPECTION END **Component Inspection** ABS000GP

ASCD STEERING SWITCH

1. Disconnect combination switch (spiral cable).

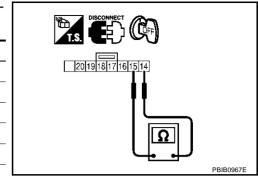
Revision; 2004 April EC-565 2003 G35 Sedan

DTC P1564 ASCD STEERING SWITCH

[TYPE 1]

2. Check continuity between combination switch (spiral cable) terminals 14 and 15 with pushing each switch.

Switch	Condition	Resistance [Ω]
CRUISE SW	Pressed	Approx. 0
CIVOIGE SW	Released	Approx. 4,000
COAST/SET SW	Pressed	Approx. 660
	Released	Approx. 4,000
ACCEL/RES SW	Pressed	Approx. 1,480
ACCEL/RES OW	Released	Approx. 4,000
CANCEL SW	Pressed	Approx. 250
	Released	Approx. 4,000



[TYPE 1]

DTC P1572 ASCD BRAKE SWITCH

PFP:25320

Component Description

(ASCD)" for the ASCD function.

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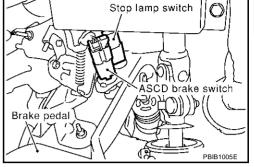
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When the brake pedal is depressed, ASCD brake switch is turned OFF and stop lamp switch is turned ON. ECM detects the state of the brake pedal by this input of two kinds (ON/OFF signal).

Refer to EC-650, "AUTOMATIC SPEED CONTROL DEVICE



CONSULT-II Reference Value in Data Monitor Mode

ABS000GR

Specification data are reference values.

MONITOR ITEM	C	CONDITION	
BRAKE SW 1	Ignition switch: ON	Brake pedal fully released	ON
(ASCD brake switch)		Brake pedal depressed	OFF
BRAKE SW 2	Ignition switch: ON	Brake pedal fully released	OFF
(stop lamp switch)	• Ignition switch. ON	Brake pedal depressed	ON

On Board Diagnosis Logic

ABSOOGS

The MIL will not light up for this diagnosis.

NOTE:

If DTC P 1572 is displayed with DTC P0605, first perform the trouble diagnosis for DTC P0605. Refer to EC-434

<u> </u>				
DTC No.	Trouble Diagnosis Name	DTC Detecting Condition	Possible Cause	J
P1572 ASCD brake switch		Harness or connectors (The stop lamp switch circuit is open or shorted.)	K	
	When the vehicle speed is above 30 km/h (19 MPH), ON signals from the stop lamp switch	Harness or connectors (The ASCD brake switch circuit is open or shorted.)	L	
1572	and the ASCD brake switch are sent to the ECM at the same time.	Stop lamp switch		
		Low at the same time.	ASCD brake switch	
			Incorrect stop lamp switch installation	M
			Incorrect ASCD brake switch installation	
		• ECM		

[TYPE 1]

DTC Confirmation Procedure

ABS000GT

CAUTION:

Always drive vehicle at a safe speed.

NOTE

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Steps 3 and 4 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.

(III) WITH CONSULT-II

- 1. Start engine (VDC switch "OFF").
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- 3. Drive the vehicle for at least 5 consecutive seconds under the following condition.

VHCL SPEED SE	More than 30 km/h (19 MPH)
Selector lever	Suitable position

If 1st trip DTC is detected, go to EC-570, "Diagnostic Procedure".

If 1st trip DTC is not detected, go to the following step.

4. Drive the vehicle for at least 5 consecutive seconds under the following condition.

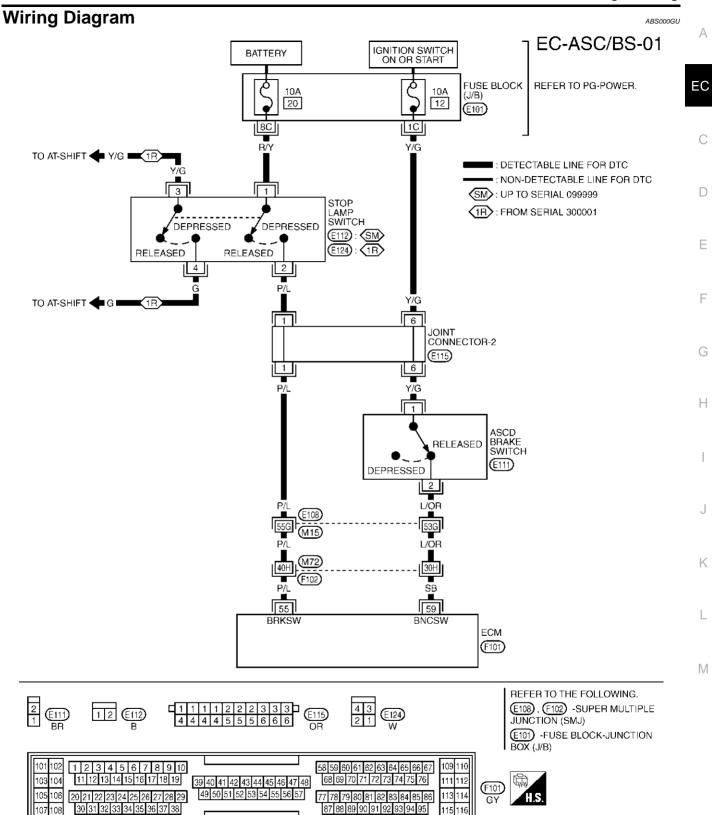
VHCL SPEED SE	More than 30 km/h (19 MPH)
Selector lever	Suitable position
Driving location	Depress the brake pedal for more than five seconds so as not to come off from the above-mentioned condition.

5. If 1st trip DTC is detected, go to EC-570, "Diagnostic Procedure".

® WITH GST

Follow the procedure "WITH CONSULT-II" above.

[TYPE 1]



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Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
			[Ignition switch "ON"]	Approximately 0V
55	55 P/L Stop lamp switch		Brake pedal is fully released	
		[Ignition switch "ON"]	BATTERY VOLTAGE	
			Brake pedal is depressed	(11 - 14V)
			[Ignition switch "ON"]	Approximately OV
59 SB ASCD brake switch	ASCD brake switch	Brake pedal is depressed	Approximately 0V	
39	39 SB AGGD Blake Switch	[Ignition switch "ON"]	BATTERY VOLTAGE	
			Brake pedal is fully released	(11 - 14V)

Diagnostic Procedure

1. CHECK OVERALL FUNCTION-I

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(P) With CONSULT-II

- 1. Turn ignition switch "ON".
- 2. Select "BRAKE SW1" in "DATA MONITOR" mode with CONSULT-II.
- 3. Check "BRAKE SW1" indication under the following conditions.

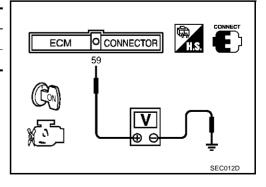
CONDITION	INDICATION
When brake pedal is depressed	OFF
When brake pedal is fully released	ON

DATA MONITOR	
MONITOR	NO DTC
BRAKE SW1	OFF

(R) Without CONSULT-II

- 1. Turn ignition switch "ON".
- 2. Check voltage between ECM terminal 59 and ground under the following conditions.

CONDITION	VOLTAGE
When brake pedal is depressed	Approximately 0V
When brake pedal is fully released	Battery voltage



OK or NG

OK >> GO TO 2.

NG >> GO TO 3.

[TYPE 1]

2. CHECK OVERALL FUNCTION-II

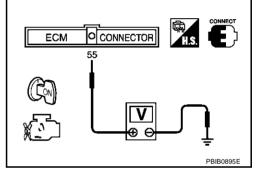
(B) With CONSULT-II Check "BRAKE SW2" indication in "DATA MONITOR" mode.

CONDITION	INDICATION
When brake pedal is released	OFF
When brake pedal is depressed	ON

DATA MONITOR	
MONITOR	NO DTC
BRAKE SW2	OFF

Without CONSULT-II Check voltage between ECM terminal 55 and ground under the following conditions.

CONDITION	VOLTAGE
When brake pedal is released	Approximately 0V
When brake pedal is depressed	Battery voltage



OK or NG

OK >> GO TO 13.

NG >> GO TO 8. EC

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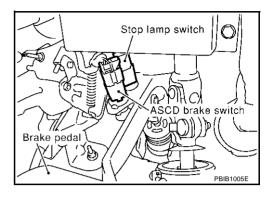
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3. CHECK ASCD BRAKE SWITCH POWER SUPPLY CIRCUIT

- 1. Turn ignition switch "OFF".
- 2. Disconnect ASCD brake switch harness connector.
- 3. Turn ignition switch "ON".

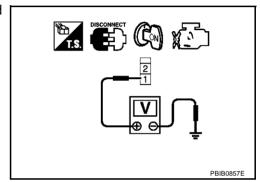


4. Check voltage between ASCD brake switch terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 5. NG >> GO TO 4.



4. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E101
- 10A fuse
- Joint connector-2
- Harness for open or short between ASCD brake switch and fuse
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK ASCD BRAKE SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch "OFF".
- 2. Disconnect ECM harness connector.
- Check harness continuity between ECM terminal 59 and ASCD brake switch terminal 2. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 7. NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness connectors M72, F102
- Harness for open or short between ECM and ASCD brake switch
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK ASCD BRAKE SWITCH

Refer to EC-629. "Component Inspection"

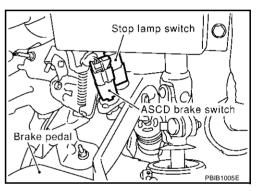
OK or NG

OK >> GO TO 13.

NG >> Replace ASCD brake switch.

8. CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT

- Turn ignition switch "OFF".
- Disconnect stop lamp switch harness connector. 2.

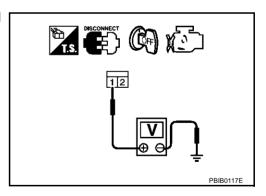


3. Check voltage between stop lamp switch terminal 1 and ground with CONSULT -II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 10. NG >> GO TO 9.



9. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E101
- 10A fuse
- Joint connector-2
- Harness for open or short between stop lamp switch and fuse
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

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10. CHECK STOP LAMP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Disconnect ECM harness connector.
- Check harness continuity between ECM terminal 55 and stop lamp switch terminal 2. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 12. NG >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness connectors M72, F102
- Joint connector-2
- Harness for open or short between ECM and stop lamp switch

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

12. CHECK STOP LAMP SWITCH

Refer to EC-629, "Component Inspection"

OK or NG

OK >> GO TO 13.

NG >> Replace stop lamp switch.

13. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

Component Inspection ASCD BRAKE SWITCH

ABS000GW

- 1. Turn ignition switch "OFF".
- Disconnect ASCD brake switch harness connector.
- 3. Check harness continuity between ASCD brake switch terminals 1 and 2 under the following conditions.

Condition	Continuity
When brake pedal is fully released.	Should exist.
When brake pedal is depressed.	Should not exist.

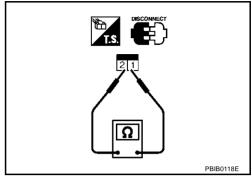
If NG, adjust ASCD brake switch installation, refer to <u>BR-6</u>, "BRAKE PEDAL", and perform step 3 again.

STOP LAMP SWITCH (UP TO SERIAL 099999)

- 1. Turn ignition switch "OFF".
- 2. Disconnect stop lamp switch harness connector.
- 3. Check harness continuity between stop lamp switch terminals 1 and 2 under the following conditions.

Condition	Continuity	
When brake pedal is fully released.	Should not exist.	
When brake pedal is depressed.	Should exist.	

If NG, adjust stop lamp switch installation, refer to <u>BR-6</u>, <u>"BRAKE PEDAL"</u>, and perform step 3 again.

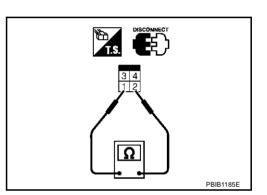


STOP LAMP SWITCH (FROM SERIAL 300001)

- 1. Turn ignition switch "OFF".
- 2. Disconnect stop lamp switch harness connector.
- 3. Check harness continuity between stop lamp switch terminals 1 and 2 under the following conditions.

Condition	Continuity	
When brake pedal is fully released. Should not exist		
When brake pedal is depressed.	Should exist.	

If NG, adjust stop lamp switch installation, refer to <u>BR-6</u>, <u>"BRAKE PEDAL"</u>, and perform step 3 again.



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[TYPE 1]

DTC P1574 ASCD VEHICLE SPEED SENSOR

PFP:31036

Component Description

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The ECM receives two vehicle speed sensor signals via CAN communication line. One is sent from combination meter, and the other is from TCM (Transmission control module). The ECM uses these signals for ASCD control. Refer to EC-650, "AUTOMATIC SPEED CONTROL DEVICE (ASCD)" for ASCD functions.

On Board Diagnosis Logic

ABS000GY

The MIL will not light up for this diagnosis.

NOTE:

- If DTC P1574 is displayed with DTC U1000, U1001, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-142, "DTC U1000, U1001 CAN COMMUNICATION LINE".
- If DTC P1574 is displayed with DTC P0500, first perform the trouble diagnosis for DTC P0500.
 Refer to EC-423, "DTC P0500 VSS"
- If DTC P1574 is displayed with DTC P0605, first perform the trouble diagnosis for DTC P0605.
 Refer to <u>EC-434</u>, "<u>DTC P0605 ECM"</u>

DTC No.	Trouble Diagnosis Name	DTC Detecting Condition	Possible Cause	
P1574 1574	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.) Combination meter VDC/TCS/ABS control unit Wheel sensor TCM ECM 	

DTC Confirmation Procedure

ABS000GZ

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Step 3 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-II

- 1. Start engine (VDC switch "OFF").
- Select "DATA MONITOR" mode with CONSULT-II.
- 3. Drive the vehicle at more than 40 km/h (25 MPH).
- 4. If 1st trip DTC is detected, go to EC-577, "Diagnostic Procedure"

DATA MONITOR]
MONITOR	NO DTC	
ENG SPEED	XXX rpm	1
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Follow the procedure "WITH CONSULT-II" above.

DTC P1574 ASCD VEHICLE SPEED SENSOR

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	[1175 1]
Diagnostic Procedure 1. CHECK DTC WITH TCM	AB\$000H0
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Check DTC with TCM. Refer to AT-39.	
OK or NG	
OK >> GO TO 2.	
NG >> Perform trouble shooting relevant to DTC indicated.	
2. CHECK DTC WITH VDC/TCS ABS CONTROL UNIT	
Refer to BRC-13, "TROUBLE DIAGNOSIS" .	
OK or NG	
OK >> GO TO 3.	
NG >> Repair or replace.	
3. CHECK COMBINATION METER	
Check combination meter function. Refer to DI-4, "COMBINATION METERS". >> INSPECTION END	

Revision; 2004 April EC-577 2003 G35 Sedan

[TYPE 1]

DTC P1706 PNP SWITCH

PFP:32006

Component Description

ABS000H1

When the gear position is "P" or "N", park/neutral position (PNP) switch is "ON". ECM detects the position because the continuity of the line (the "ON" signal) exists.

CONSULT-II Reference Value in Data Monitor Mode

ABSOOOHS

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
P/N POSI SW	Ignition switch: ON	Shift lever: P or N	ON
17111 031 311		Shift lever: Except above	OFF

On Board Diagnosis Logic

ABS000H3

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1706 1706	Park/neutral position switch	The signal of the park/neutral position (PNP) switch is not changed in the process of engine starting and driving.	 Harness or connectors [The park/neutral position (PNP) switch circuit is open or shorted.] Park/neutral position (PNP) switch

DTC Confirmation Procedure

ABS000H4

CAUTION:

Always drive vehicle at a safe speed.

NOTE

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

(WITH CONSULT-II

- Turn ignition switch "ON".
- Select "P/N POSI SW" in "DATA MONITOR" mode with CON-SULT-II. Then check the "P/N POSI SW" signal under the following conditions.

Position (Selector lever)	Known-good signal
"N" and "P" position	ON
Except the above position	OFF

DATA MONITOR

MONITOR NO DTC

P/N POSI SW ON

SEF212Y

If NG, go to EC-581, "Diagnostic Procedure".

If OK, go to following step.

- Select "DATA MONITOR" mode with CONSULT-II.
- 4. Start engine and warm it up to normal operating temperature.
- Maintain the following conditions for at least 60 consecutive seconds.

ENG SPEED	1,400 - 6375 rpm
COOLAN TEMP/S	More than 70°C (158°F)
B/FUEL SCHDL	2.0 - 3.8 msec
VHCL SPEED SE	More than 64 km/h (40 MPH)
Selector lever	Suitable position

6. If 1st trip DTC is detected, go to EC-581, "Diagnostic Procedure"

DATA MON	ИT)R
MONITOR		NO DTC
ENG SPEED	X	XX rpm
COOLAN TEMP/S	;	xxx .c
VHCL SPEED SE	X	XX km/h
P/N POSI SW		OFF
B/FUEL SCHDL	X	(X msec

Overall Function Check

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Use this procedure to check the overall function of the park/neutral position (PNP) switch circuit. During this check, a 1st trip DTC might not be confirmed.

DTC P1706 PNP SWITCH

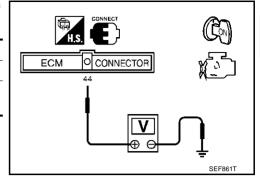
[TYPE 1]

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- 1. Turn ignition switch "ON".
- 2. Check voltage between ECM terminal 44 (PNP switch signal) and ground under the following conditions.

Condition (Gear position)	Voltage V (Known good data)
"P" and "N" position	Approx. 0
Except the above position	BATTERY VOLTAGE (11 - 14V)

3. If NG, go to EC-581, "Diagnostic Procedure".



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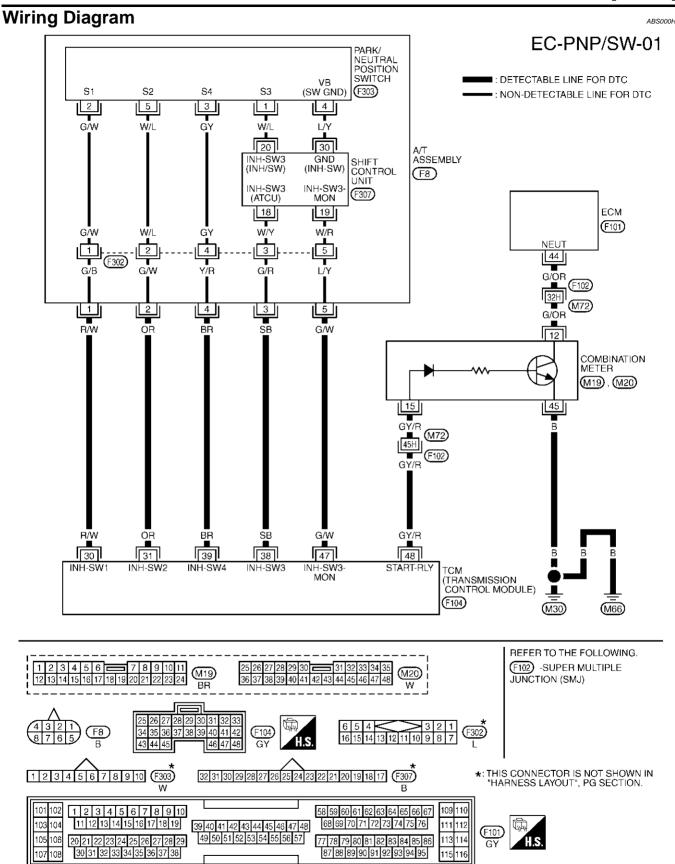
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DTC P1706 PNP SWITCH

[TYPE 1]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
44 G/OR PNP switch	PNP switch	[Ignition switch "ON"] ● Gear position is "P" or "N".	Approximately 0V	
44	44 G/OR PNP SWILCTI	[Ignition switch "ON"] • Except the above gear position	BATTERY VOLTAGE (11 - 14V)	

Diagnostic Procedure

1. INSPECTION START

Do you have CONSULT-II?

Yes or No

Yes >> GO TO 2. No >> GO TO 3.

2. CHECK PNP SWITCH SIGNAL

(P) With CONSULT-II

- Turn ignition switch "ON".
- Select "A/T", then "DATA MONITOR" mode with CONSULT-II.
- Select "P/N POSI SW" signal and check its indication under the following conditions.

Condition (Gear position)	P/N POSI SW
"P" or "N" position	ON
Other position	OFF

OK or NG

OK >> GO TO 5. NG >> GO TO 4.

DATA MONIT	DATA MONITOR	
MONITORING	NO DTC	
P/N POSI SW	ON	

3. CHECK PNP SWITCH

(R) Without CONSULT-II

Confirm that the PNP switch signal is sent to TCM correctly.

Refer to AT-110, "DTC P0705 PARK/NEUTRAL POSITION SWITCH".

OK or NG

>> GO TO 5. OK NG >> GO TO 4.

4. CHECK INTERMITTENT INCIDENT

Check the PNP switch circuit.

Refer to AT-110, "DTC P0705 PARK/NEUTRAL POSITION SWITCH".

>> INSPECTION END

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5. CHECK PNP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT-I

- 1. Turn ignition switch "OFF".
- 2. Disconnect TCM harness connector.
- 3. Disconnect combination meter harness connector.
- 4. Check harness continuity between TCM terminal 48 and combination meter terminal 15. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 7 NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F102, M72
- Harness for open or short between TCM and combination meter
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK PNP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT-II

 Check harness continuity between combination meter terminal 45 and ground. Refer to Wiring Diagram.

Continuity should exist.

2. Also check harness for short to power.

OK or NG

OK >> GO TO 8.

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

8. CHECK PNP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT-III

- Disconnect ECM harness connector.
- Check harness continuity between ECM terminal 44 and combination meter terminal 12. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 10. NG >> GO TO 9.

9. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F102, M72
- Harness for open or short between ECM and combination meter
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

DTC P1706 PNP SWITCH

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	[TYPE 1]
10. CHECK COMBINATION METER	
Refer to DI-4, "COMBINATION METERS".	
OK or NG	
OK >> GO TO 11. NG >> Replace combination meter	
11. CHECK INTERMITTENT INCIDENT	
Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".	
>> INSPECTION END	

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[TYPE 1]

DTC P1805 BRAKE SWITCH

PFP:25320

Description

ARSOOOHS

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 driving.

CONSULT-II Reference Value in Data Monitor Mode

ABS000H9

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
BRAKE SW	Ignition switch: ON	Brake pedal: Fully released	OFF
DIVARL SW		Brake pedal: Slightly depressed	ON

On Board Diagnosis Logic

ABS000HA

The MIL will not light up for this diagnosis.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1805 1805	Brake switch	A brake switch signal is not sent to ECM for an extremely long time while the vehicle is driving.	 Harness or connectors (Stop lamp switch circuit is open or shorted.) Stop lamp switch

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode.

Engine operating condition in fail-safe mode				
ECM controls the electric throttle control actuator by regulating the Therefore, acceleration will be poor.	e throttle opening to a small range.			
	Driving condition			
When engine is idling	Normal			
When accelerating	Poor acceleration			

DTC Confirmation Procedure

ARSOOOHR

(WITH CONSULT-II

- 1. Turn ignition switch "ON".
- 2. Fully depress the brake pedal for at least 5 seconds.
- 3. Erase the DTC with CONSULT-II.
- 4. Select "DATA MONITOR" mode with CONSULT-II.
- 5. If 1st trip DTC is detected, go to EC-586, "Diagnostic Procedure"

DATA MO	ONITOR
MONITOR	NO DTC
ENG SPEED	XXX rpm
	•

WITH GST

Follow the procedure "WITH CONSULT-II" above.

Wiring Diagram Α EC-BRK/SW-01 ■: DETECTABLE LINE FOR DTC : NON-DETECTABLE LINE FOR DTC EC SM: UP TO SERIAL 099999 1R : FROM SERIAL 300001 BATTERY C FUSE BLOCK (J/B) REFER TO PG-POWER. 20 (E101) D TO AT-SHIFT TY/G F STOP LAMP SWITCH DEPRESSED DEPRESSED E112 : SM (E124): (1R) RELEASED RELEASED IL4 2 G TO AT-SHIFT G IR JOINT CONNECTOR-2 Н M15 (M72)P/L 55 BRKSW **ECM** (F101) M REFER TO THE FOLLOWING. 1 1 1 1 2 2 2 3 3 3 TE115 4 4 4 4 5 5 5 6 6 6 OR (E108), (F102) -SUPER MULTIPLE JUNCTION (SMJ) 1 2 E112 E101) -FUSE BLOCK-JUNCTION BOX (J/B) 109 110 1 2 3 4 5 6 7 8 9 10 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 103 104 11 12 13 14 15 16 17 18 19 111 112 39 40 41 42 43 44 45 46 47 48 (F101) 49 50 51 52 53 54 55 56 57 105 106 20 21 22 23 24 25 26 27 28 29 77 78 79 80 81 82 83 84 85 86

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87 88 89 90 91 92 93 94 95

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
55 P/L	Stop lamp switch	[Ignition switch "ON"] • Brake pedal is fully released	Approximately 0V	
	Stop famp switch	[Ignition switch "ON"] • Brake pedal is depressed	BATTERY VOLTAGE (11 - 14V)	

Diagnostic Procedure

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1. CHECK STOP LAMP SWITCH CIRCUIT

- 1. Turn ignition switch "OFF".
- 2. Check the stop lamp when depressing and releasing the brake pedal.

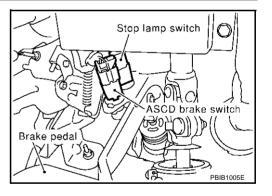
Brake pedal	Stop lamp
Fully released	Not illuminated
Depressed	Illuminated

OK or NG

OK >> GO TO 4. NG >> GO TO 2.

2. CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT

1. Disconnect stop lamp switch harness connector.

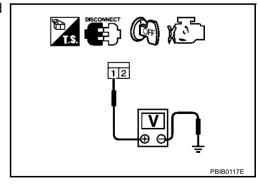


2. Check voltage between stop lamp switch terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 4. NG >> GO TO 3.



$\overline{3}$. DETECT MALFUNCTIONING PART

Check the following.

- 10A fuse
- Fuse block (J/B) connector E101
- Harness for open and short between stop lamp switch and battery
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK STOP LAMP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch "OFF".
- 2. Disconnect ECM harness connector.
- Disconnect stop lamp switch harness connector.
- Check harness continuity between ECM terminal 55 and stop lamp switch terminal 2.

Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 6. >> GO TO 5. NG

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness connectors M72, F102
- Joint connector-2
- Harness for open or short between ECM and stop lamp switch

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

6. CHECK STOP LAMP SWITCH

Refer to EC-588, "Component Inspection".

OK or NG

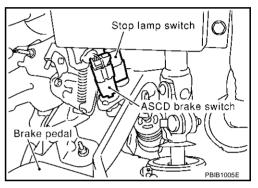
OK >> GO TO 7.

NG >> Replace stop lamp switch.

7. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END



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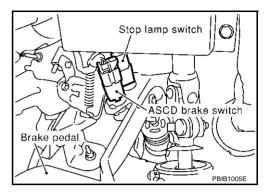
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Component Inspection STOP LAMP SWITCH (UP TO SERIAL 099999)

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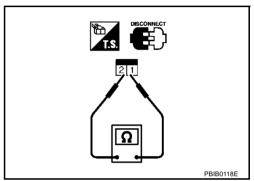
1. Disconnect stop lamp switch harness connector.



2. Check continuity between stop lamp switch terminals 1 and 2 under the following conditions.

Conditions	Continuity
Brake pedal fully released	Should not exist.
Brake pedal depressed	Should exist.

3. If NG, adjust stop lamp switch installation, refer to <u>BR-6</u>, <u>"BRAKE PEDAL"</u>, and perform step 2 again.

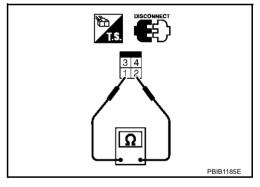


STOP LAMP SWITCH (FROM SERIAL 300001)

- 1. Turn ignition switch "OFF".
- 2. Disconnect stop lamp switch harness connector.
- 3. Check harness continuity between stop lamp switch terminals 1 and 2 under the following conditions.

Condition	Continuity
When brake pedal is fully released.	Should not exist.
When brake pedal is depressed.	Should exist.

If NG, adjust stop lamp switch installation, refer to <u>BR-6</u>, <u>"BRAKE PEDAL"</u>, and perform step 3 again.



IGNITION SIGNAL

[TYPE 1]

PBIB1007E

IGNITION SIGNAL PFP:22448

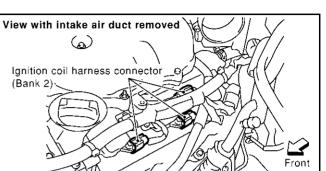
Component Description IGNITION COIL & POWER TRANSISTOR

Ignition coil harness connector

(Bank 1) {{\}}

ABS000HF

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.



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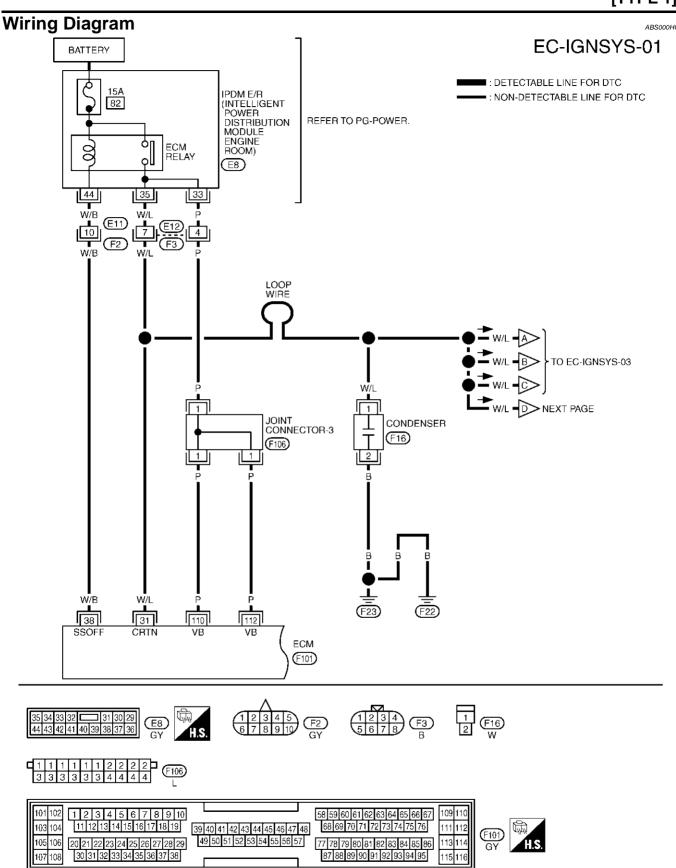
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TBWT0176E

IGNITION SIGNAL

[TYPE 1]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
31	W/L	Counter current return [Ignition switch "ON"]		BATTERY VOLTAGE (11 - 14V)
38	W/B	ECM relay (Self shut-off)	[Engine is running] [Ignition switch "OFF"] ● For a few seconds after turning ignition switch "OFF"	0 - 1.5V
(Sell Stiut-oil)		(Seii Silut-Oii)	[Ignition switch "OFF"] ● A few seconds passed after turning ignition switch "OFF"	BATTERY VOLTAGE (11 - 14V)
110 112	P P	Power supply for ECM	[Ignition switch "ON"]	BATTERY VOLTAGE (11 - 14V)

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EC-IGNSYS-02 ■: DETECTABLE LINE FOR DTC : NON-DETECTABLE LINE FOR DTC ECM (F101) IGN-I#1 IGN-I#3 IGN-I#5 7 5 16 PU/W L/R PRECEDING D W/L Y/R W/L ĽR (F201) 2 L/R 5 W/L LOOP WIRE W/L W/L PŪ/W L/R 3 IGNITION IGNITION COIL NO.3 IGNITION COIL NO.5 (WITH POWER TRANSISTOR) COIL NO.1 (WITH POWER TRANSISTOR) (WITH POWER TRANSISTOR) 000 000 000 <u>0000</u> \overline{m} ത്ത (F203) (F202) (F15) 2 2 2 SPARK H SPARK PLUG SPARK PLUG B - 1 - B (F201) (F18) (F23) (F22) 123 456 F18



3 2 1 (F15), (F202), (F203) GY GY

TBWT0177E

IGNITION SIGNAL

[TYPE 1]

Specification data are reference values and are measured between each terminal and ground. Pulse signal is measured by CONSULT-II.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
5 Y/R		[Engine is running] • Warm-up condition • Idle speed	Warm-up condition	0 - 0.2V*
16	L/R PU/W	Ignition signal No. 3 Ignition signal No. 5	 [Engine is running] Warm-up condition Engine speed is 2,500 rpm. 	0.1 - 0.3V*

^{★:} Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

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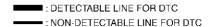
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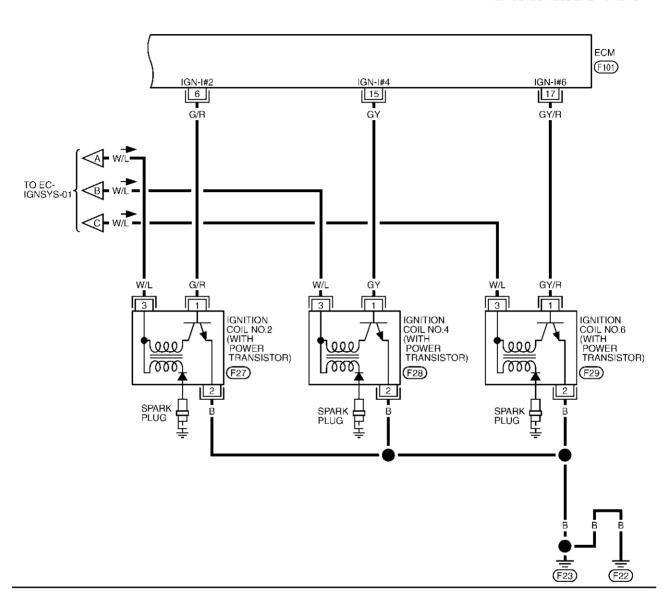
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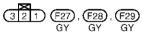
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EC-IGNSYS-03









TBWT0178E

Specification data are reference values and are measured between each terminal and ground. Pulse signal is measured by CONSULT-II.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
6 G/R	Ignition signal No. 2		0 - 0.2V★	
15 17	GY GY/R	Ignition signal No. 4 Ignition signal No. 6	[Engine is running]Warm-up conditionEngine speed is 2,500 rpm.	0.1 - 0.3V*

^{★:} Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

1. CHECK ENGINE START

Turn ignition switch "OFF", and restart engine.

Is engine running?

Yes or No

Yes (With CONSULT-II)>>GO TO 2. Yes (Without CONSULT-II)>>GO TO 3.

No >> GO TO 4.

2. CHECK OVERALL FUNCTION

(P) With CONSULT-II

- 1. Perform "POWER BALANCE" in "ACTIVE TEST" mode with CONSULT-II.
- 2. Make sure that each circuit produces a momentary engine speed drop.

OK or NG

OK >> INSPECTION END

NG >> GO TO 10.

ACTIVE TEST		
POWER BALANCE		
MONITOR	1	
ENG SPEED	XXX rpm	
MAS A/F SE-B1	xxx v	
	1	PBIB0133E

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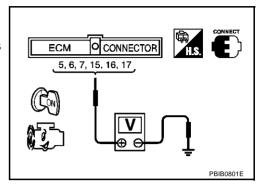
$\overline{3}$. CHECK OVERALL FUNCTION

W Without CONSULT-II

- 1. Let engine idle.
- 2. Read the voltage signal between ECM terminals 5, 6, 7, 15, 16, 17 and ground with an oscilloscope.
- 3. Verify that the oscilloscope screen shows the signal wave as shown below.



SEC986C



OK or NG

OK >> INSPECTION END

NG >> GO TO 10.

4. CHECK IGNITION COIL POWER SUPPLY CIRCUIT-I

- 1. Turn ignition switch OFF, wait at least 10 seconds and then turn ON.
- 2. Check voltage between ECM terminals 110, 112 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 5.

NG >> Go to EC-136, "POWER SUPPLY CIRCUIT FOR ECM"

ECM O CONNECTOR

110, 112

V

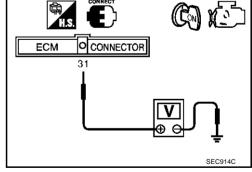
5. CHECK IGNITION COIL POWER SUPPLY CIRCUIT-II

Check voltage between ECM terminal 31 and ground with CON-SULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 8. NG >> GO TO 6.



6. CHECK IGNITION COIL POWER SUPPLY CIRCUIT-III

- Turn ignition switch OFF. 1.
- 2. Disconnect ECM harness connector.
- Disconnect IPDM E/R harness connector.
- Check harness continuity between ECM terminal 31 and IPDM E/R terminal 35. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> Replace IPDM E/R.

NG >> GO TO 7.

7. DETECT MALFUNCTIONING PART

Check the following.

- Harness or connectors E12, F3
- Harness for open and short between ECM and IPDM E/R
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

8. CHECK CONDENSER CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF. 1.
- 2. Disconnect condenser harness connector.
- 3. Disconnect ECM harness connector.
- Check harness continuity between ECM terminal 31 and condenser terminal 1, condenser terminal 2 and engine ground. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 9.

NG >> Repair open circuit or short to ground or short to power

in harness or connectors.

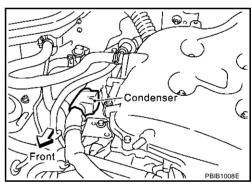
9. CHECK CONDENSER

Refer to EC-599, "Component Inspection".

OK or NG

>> GO TO 10. OK

NG >> Replace condenser.



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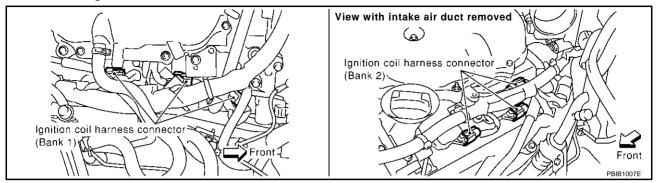
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10. CHECK IGNITION COIL POWER SUPPLY CIRCUIT-V

- 1. Turn ignition switch OFF.
- 2. Reconnect all harness connectors disconnected.
- Disconnect ignition coil harness connector.

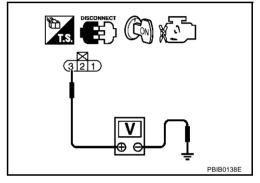


- 4. Turn ignition switch ON.
- 5. Check voltage between ignition coil terminal 3 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 12. NG >> GO TO 11.



11. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F18, F201
- Harness for open or short between ignition coil and ECM
- Harness for open or short between ignition coil and harness connector F3
 - >> Repair or replace harness or connectors.

12. CHECK IGNITION COIL GROUND CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- Check harness continuity between ignition coil terminal 2 and engine ground. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 14. NG >> GO TO 13.

13. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F18, F201
- Harness for open or short between ignition coil and engine ground
 - >> Repair open circuit or short to power in harness or connectors.

14. CHECK IGNITION COIL OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Disconnect ECM harness connector.
- 2. Check harness continuity between ECM terminals 5, 6, 7, 15, 16, 17 and ignition coil terminal 1. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 16. NG >> GO TO 15.

15. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F18, F201
- Harness for open or short between ignition coil and ECM
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

16. CHECK IGNITION COIL WITH POWER TRANSISTOR

Refer to EC-599, "Component Inspection".

OK or NG

OK >> GO TO 17.

NG >> Replace ignition coil with power transistor.

17. CHECK INTERMITTENT INCIDENT

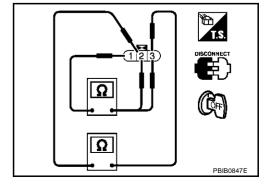
Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

Component Inspection IGNITION COIL WITH POWER TRANSISTOR

- Turn ignition switch "OFF".
- 2. Disconnect ignition coil harness connector.
- 3. Check resistance between ignition coil terminals as follows.

Terminal No. (Polarity)	Resistance Ω [at 25°C (77°F)]
1 and 2	Except 0 or ∞
1 and 3	Except 0
2 and 3	Except o



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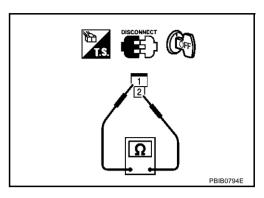
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CONDENSER

- 1. Turn ignition switch "OFF".
- 2. Disconnect condenser harness connector.
- 3. Check resistance between condenser terminals 1 and 2.

Resistance	Above 1 MΩ at 25°C (77°F)



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Removal and Installation IGNITION COIL WITH POWER TRANSISTOR

Refer to EM-34, "IGNITION COIL" .

[TYPE 1]

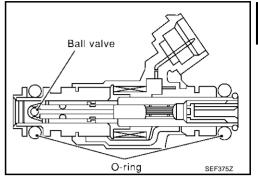
INJECTOR CIRCUIT

PFP:16600

Component Description

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The fuel injector is a small, precise solenoid valve. When the ECM supplies a ground to the injector circuit, the coil in the injector is energized. The energized coil pulls the needle valve back and allows fuel to flow through the injector into the intake manifold. The amount of fuel injected depends upon the injection pulse duration. Pulse duration is the length of time the injector remains open. The ECM controls the injection pulse duration based on engine fuel needs.



CONSULT-II Reference Value in Data Monitor Mode

ABS000C

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
	Engine: After warming up	Idle	2.5 - 3.5 msec
B/FUEL SCHDL	Shift lever: N		
Bri dee donibe	Air conditioner switch: OFF	2,000 rpm	2.5 - 3.5 msec
	No-load		
	Engine: After warming up	Idle	2.0 - 3.0 msec
INJ PULSE-B1	Shift lever: N		
INJ PULSE-B2	Air conditioner switch: OFF	2,000 rpm	1.9 - 2.9 msec
	No-load		

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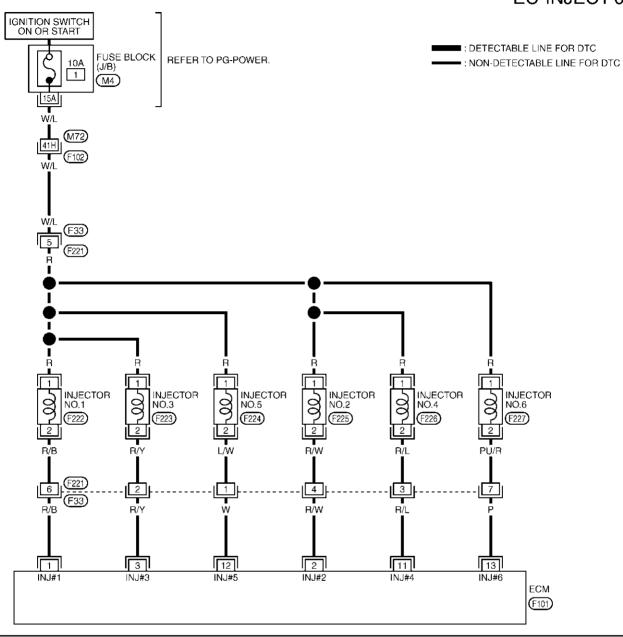
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Wiring Diagram

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EC-INJECT-01

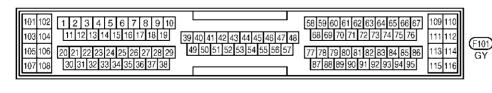




REFER TO THE FOLLOWING.

(F102) -SUPER MULTIPLE JUNCTION (SMJ)

M4) -FUSE BLOCK-JUNCTION BOX (J/B)





TBWT0179E

INJECTOR CIRCUIT

[TYPE 1]

Specification data are reference values and are measured between each terminal and ground. Pulse signal is measured by CONSULT-II.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
1 2 3	R/B R/W R/Y	Injector No. 1 Injector No. 2 Injector No. 3	[Engine is running] • Warm-up condition • Idle speed	BATTERY VOLTAGE (11 - 14V)* Interpretation of the property o
11 12 13	R/L W P	Injector No. 4 Injector No. 5 Injector No. 6	[Engine is running]Warm-up conditionEngine speed is 2,000 rpm	BATTERY VOLTAGE (11 - 14V)* INTERPRETATION SO THE DIVIDING SEC985C

^{★:} Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

1. INSPECTION START

Turn ignition switch to "START".

Is any cylinder ignited?

Yes or No

Yes >> GO TO 2. No >> GO TO 3. EC

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2. CHECK OVERALL FUNCTION

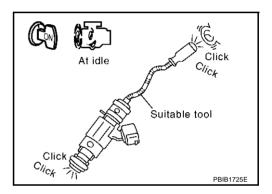
(II) With CONSULT-II

- 1. Start engine.
- Perform "POWER BALANCE" in "ACTIVE TEST" mode with CONSULT-II.
- 3. Make sure that each circuit produces a momentary engine speed drop.

ACTIVE TES	3T
POWER BALANCE	
MONITOR	
ENG SPEED	XXX rpm
MAS A/F SE-B1	xxx v

⋈ Without CONSULT-II

- 1. Start engine.
- 2. Listen to each injector operating sound. Clicking noise should be heard.



OK or NG

OK >> INSPECTION END

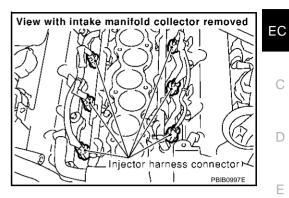
NG >> GO TO 3.

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3. CHECK INJECTOR POWER SUPPLY CIRCUIT

- Turn ignition switch "OFF".
- 2. Disconnect injector harness connector.
- Turn ignition switch "ON".

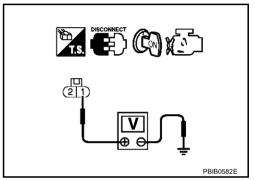


Check voltage between injector terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 5. NG >> GO TO 4.



4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M72, F102
- Harness connectors F33, F221
- Fuse block (J/B) connector M4
- 10A fuse
- Harness for open or short between injector and fuse

>> Repair harness or connectors.

5. CHECK INJECTOR OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch "OFF". 1.
- Disconnect ECM harness connector.
- Check harness continuity between injector terminal 2 and ECM terminals 1, 2, 3, 11, 12, 13. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 7. NG >> GO TO 6.

EC-605 2003 G35 Sedan Revision; 2004 April

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F33, F221
- Harness for open or short between injector and ECM
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK INJECTOR

Refer to EC-606, "Component Inspection".

OK or NG

OK >> GO TO 8.

NG >> Replace injector.

8. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

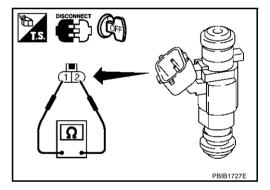
>> INSPECTION END

Component Inspection INJECTOR

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- 1. Disconnect injector harness connector.
- 2. Check resistance between terminals as shown in the figure.

Resistance: $13.5 - 17.5\Omega$ [at $10 - 60^{\circ}$ C ($50 - 140^{\circ}$ F)]



Removal and Installation INJECTOR

Refer to EM-37, "FUEL INJECTOR AND FUEL TUBE".

ABS000HV

START SIGNAL

[TYPE 1]

START SIGNAL

PFP:48750

CONSULT-II Reference Value in Data Monitor Mode

ABS000HW

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
START SIGNAL	• Ignition switch: $ON \rightarrow START \rightarrow ON$	$OFF \to ON \to OFF$

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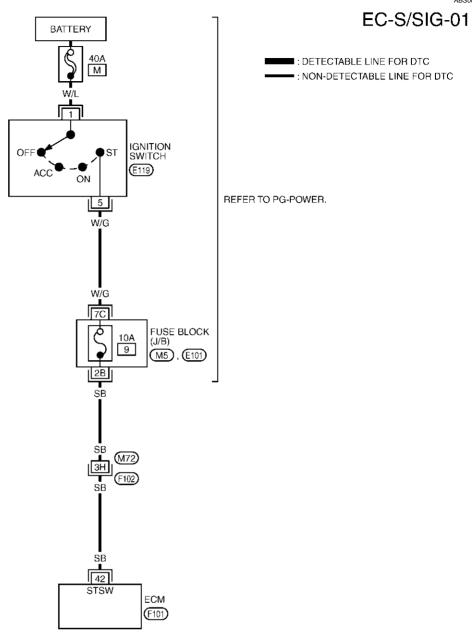
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Wiring Diagram

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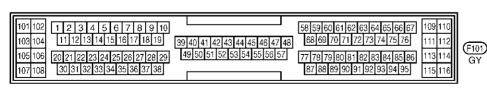




REFER TO THE FOLLOWING.

(F102) -SUPER MULTIPLE
JUNCTION (SMJ)

M5), (E101) -FUSE BLOCK-JUNCTION BOX (J/B)





TBWT0180E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	I WIR⊢	ITEM	CONDITION	DATA (DC Voltage)
42	SB	Start signal	[Ignition switch "ON"]	Approximately 0V
42	30	Start signal	[Ignition switch "START"]	9 - 12V

Diagnostic Procedure

1. INSPECTION START

Do you have CONSULT-II?

Yes or No

Yes >> GO TO 2. No >> GO TO 3.

2. CHECK OVERALL FUNCTION

(P) With CONSULT-II

- Turn ignition switch "ON".
- Check "START SIGNAL" in "DATA MONITOR" mode with CON-SULT-II under the following conditions.

Condition	START SIGNAL
Ignition switch "ON"	OFF
Ignition switch "START"	ON

OK or NG

OK >> INSPECTION END

NG >> GO TO 4.

DATA MONITOR MONITOR NO DTC START SIGNAL OFF CLSD THE POS ON AIR COND SIG OFF P/N POSI SW ON PBIB0182E

3. CHECK OVERALL FUNCTION

(R) Without CONSULT-II

Check voltage between ECM terminal 42 and ground under the following conditions.

Condition	Voltage
Ignition switch "START"	Battery voltage
Other positions	Approximately 0V

OK or NG

OK >> INSPECTION END

NG >> GO TO 4.

CONNECTOR ECM ⊕⊝ PBIB0183F

4. CHECK STARTING SYSTEM

Turn ignition switch "OFF", then turn it to "START".

Does starter motor operate?

Yes or No

>> GO TO 5. Yes

>> Refer to SC-9, "STARTING SYSTEM". No

EC-609 Revision; 2004 April 2003 G35 Sedan

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5. CHECK FUSE

- 1. Turn ignition switch "OFF".
- 2. Disconnect 10A fuse.
- 3. Check if 10A fuse is OK.

OK or NG

OK >> GO TO 6.

NG >> Replace 10A fuse.

6. CHECK START SIGNAL INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Disconnect ECM harness connector.
- 2. Disconnect ignition switch harness connector.
- 3. Check harness continuity between ECM terminal 42 and ignition switch terminal 5. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 8. NG >> GO TO 7.

7. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M72, F102
- Fuse block (J/B) connectors M5, E101
- Harness for open or short between ignition switch and fuse block (J/B)
- Harness for open or short between ECM and fuse block (J/B)
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

8. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

FUEL PUMP CIRCUIT

[TYPE 1]

FUEL PUMP CIRCUIT

Description SYSTEM DESCRIPTION

PFP:17042

ABS000HZ

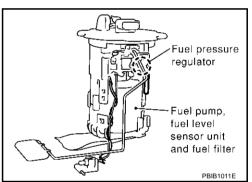
Sensor	Input Signal to ECM	ECM Function	Actuator
Crankshaft position sensor (POS) Camshaft position sensor (PHASE)	Engine speed	Fuel pump control	Fuel pump relay
Ignition switch	Start signal		

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 (PHASE), 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 DESCRIPTION

A turbine type design fuel pump is used in the furl tank.



CONSULT-II Reference Value in Data Monitor Mode

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
 For 1 second after turning ignition switch ON FUEL PUMP RLY Engine running or cranking 		ON
	Except above conditions	OFF

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Wiring Diagram EC-F/PUMP-01 IGNITION SWITCH ON OR START : DETECTABLE LINE FOR DTC ■: NON-DETECTABLE LINE FOR DTC IPDM E/R (INTELLIGENT POWER REFER TO PG-POWER. 81 DISTRIBUTION MODULE ENGINE ROOM) PUMP RELAY 20 B/OR B/Y B/Y 18 B/OR E106 2G (M15) B/OR B/OR (M72) FUEL LEVEL SENSOR UNIT AND FUEL PUMP (FUEL PUMP) B/OR CONDENSER (B26) G/B B/OR **ECM** (F101) (B29) (B5) REFER TO THE FOLLOWING. (E108), (F102) -SUPER MULTIPLE JUNCTION (SMJ) 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 **E**7 1 2 3 4 5 6 7 8 9 10 58 59 60 61 62 63 64 65 66 67 103 104 11 12 13 14 15 16 17 18 19 68 69 70 71 72 73 74 75 76 39 40 41 42 43 44 45 46 47 48 (F101) 105 106 49 50 51 52 53 54 55 56 57 20 21 22 23 24 25 26 27 28 29 77 78 79 80 81 82 83 84 85 86

TBWT0181E

FUEL PUMP CIRCUIT

[TYPE 1]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
23 B/O	B/OR	Fuel pump relay	[Ignition switch "ON"]● For 1 second after turning ignition switch "ON"[Engine is running]	0 - 1.5V
			[Ignition switch "ON"] ■ More than 1 second after turning ignition switch "ON".	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

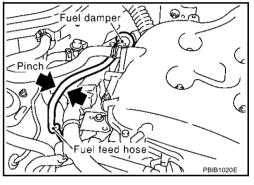
1. CHECK OVERALL FUNCTION

- 1. Turn ignition switch "ON".
- Pinch fuel feed hose with two fingers.
 Fuel pressure pulsation should be felt on the fuel feed hose for 1 second after ignition switch is turned "ON".

OK or NG

OK >> INSPECTION END

NG >> GO TO 2.



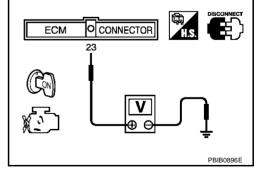
2. CHECK FUEL PUMP POWER SUPPLY CIRCUIT-I

- 1. Turn ignition switch "OFF".
- Disconnect ECM harness connector.
- 3. Turn ignition switch "ON".
- 4. Check voltage between ECM terminal 23 and ground with CON-SULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 5. NG >> GO TO 3.



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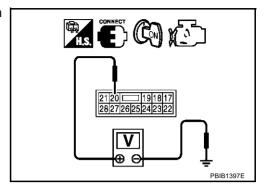
3. CHECK FUEL PUMP POWER SUPPLY CIRCUIT-I

- 1. Turn ignition switch "ON".
- 2. Check voltage between IPDM E/R terminal 20 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 4. NG >> GO TO 13.



4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108. M15
- Harness connectors M72, F102
- Harness for open or short between IPDM E/R and ECM

>> Repair harness or connectors.

5. CHECK CONDENSER POWER SUPPLU CIRCUIT-I

- 1. Turn ignition switch "OFF".
- 2. Reconnect all harness connectors disconnected.
- 3. Disconnect condenser harness connector.
- 4. Turn ignition switch "ON".
- 5. Check voltage between condenser terminal 1 and ground with CONSULT-II or tester.

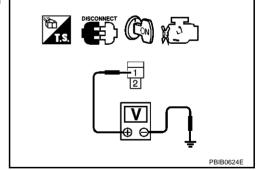
Voltage: Battery voltage should exist for 1 second after ignition switch is turned

"ON".

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

OK or NG

OK >> GO TO 9. NG >> GO TO 6.



6. CHECK 15A FUSE

- 1. Turn ignition switch "OFF".
- 2. Disconnect 15A fuse.
- 3. Check 15A fuse.

OK or NG

OK >> GO TO 7. NG >> Replace fuse.

[TYPE 1]

7. CHECK CONDENSER POWER SUPPLY CIRCUIT-II

- 1. Disconnect IPDM E/R harness connector E7.
- Check harness continuity between IPDM E/R terminal 23 and condenser terminal 1. Refer to Wiring Diagram.

EC

Continuity should exist.

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

OK or NG

OK >> GO TO 13. NG >> GO TO 8.

8. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E106, B2
- Harness for open or short between IPDM E/R and condenser

>> Repair harness or connectors.

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9. CHECK CONDENSER GROUND CIRCUIT

1. Check harness continuity between condenser terminal 2 and ground. Refer to Wiring Diagram.

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Continuity should exist.

2. Also check harness for short to power.

OK or NG

OK >> GO TO 10.

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

10. CHECK CONDENSER

Refer to EC-616, "Component Inspection".

OK or NG

OK >> GO TO 11.

NG >> Replace condenser.

L

11. CHECK FUEL PUMP POWER SUPPLU AND GROUND CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch "OFF".
- 2. Disconnect fuel level sensor unit and fuel pump harness connector.
- Check harness continuity between "fuel level sensor unit and fuel pump" terminal 1 and harness connector B2 terminal 18, "fuel level sensor unit and fuel pump" terminal 3 and ground. Refer to Wiring Diagram.

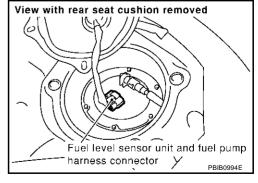
Continuity should exist.

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

OK or NG

OK >> GO TO 12.

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



Revision; 2004 April EC-615 2003 G35 Sedan

$\overline{12}$. CHECK CONDENSER

Refer to EC-616, "Component Inspection".

OK or NG

OK >> GO TO 13.

NG >> Replace fuel pump.

13. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

OK or NG

OK >> Replace IPDM E/R.

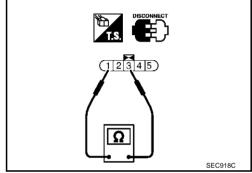
NG >> Repair or replace harness or connectors.

Component Inspection FUEL PUMP

ABS00013

- 1. Disconnect fuel level sensor unit and fuel pump harness connector.
- 2. Check resistance between "fuel level sensor unit and fuel pump" terminals 1 and 3.

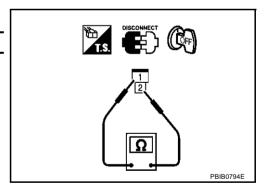
Resistance: Approximately 1.0 Ω [at 25°C (77°F)]



CONDENSER

- Turn ignition switch "OFF".
- 2. Disconnect condenser harness connector.
- 3. Check resistance between condenser terminals as 1 and 2.

Б : -	AL 4.140 (0500 (3705)
Resistance	Above 1 M Ω at 25°C (77°F)



Removal and Installation FUEL PUMP

ABS00014

Refer to FL-5, "FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY".

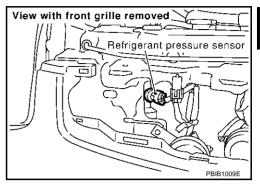
REFRIGERANT PRESSURE SENSOR

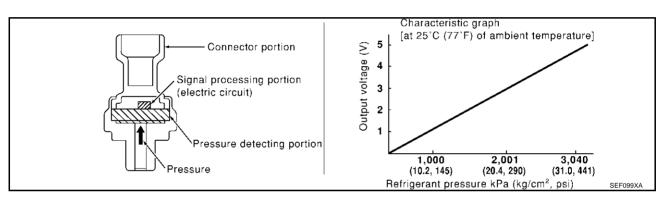
PFP:92136

Component Description

ABS00019

The refrigerant pressure sensor is installed at the liquid tank 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.





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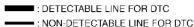
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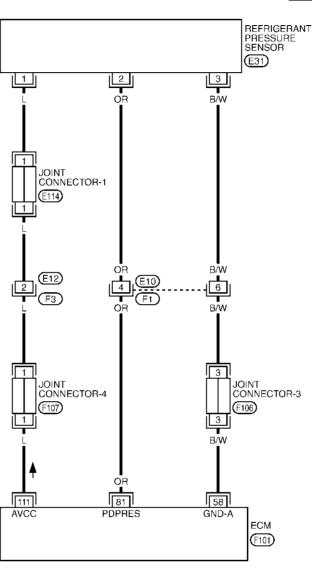
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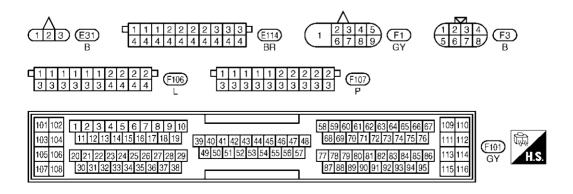
Wiring Diagram

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EC-RP/SEN-01







TBWT0182E

REFRIGERANT PRESSURE SENSOR

[TYPE 1]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
58	B/W	Sensors' ground	[Engine is running]Warm-up conditionIdle speed	Approximately 0V
81	OR	Refrigerant pressure sensor	 [Engine is running] Warm-up condition Both A/C switch and blower switch are "ON". (Compressor operates.) 	1.0 - 4.0V
111	L	Sensors' power supply	[Ignition switch "ON"]	Approximately 5V

Diagnostic Procedure

1. CHECK REFRIGERANT PRESSURE SENSOR OVERALL FUNCTION

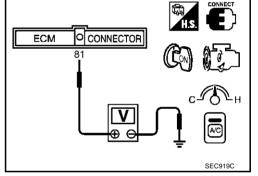
- 1. Start engine and warm it up to normal operating temperature.
- 2. Turn A/C switch and blower switch "ON".
- 3. Check voltage between ECM terminal 81 and ground with CON-SULT-II or tester.

Voltage: 1.0 - 4.0V

OK or NG

OK >> INSPECTION END

NG >> GO TO 2.



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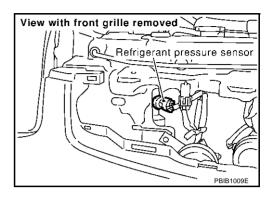
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$\overline{2}$. Check refrigerant pressure sensor power supply circuit

- 1. Turn A/C switch and blower switch "OFF".
- 2. Stop engine.
- 3. Disconnect refrigerant pressure sensor harness connector.
- Turn ignition switch "ON".

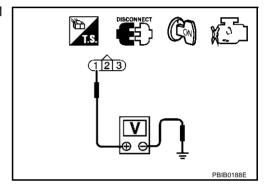


5. Check voltage between refrigerant pressure sensor terminal 1 and ground with CONSULT-II or tester.

Voltage: Approximately 5V

OK or NG

OK >> GO TO 4. NG >> GO TO 3.



3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Joint connector-1
- Joint connector-4
- Harness for open or short between ECM and refrigerant pressure sensor
 - >> Repair harness or connectors.

4. CHECK REFRIGERANT PRESSURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch "OFF".
- 2. Check harness continuity between refrigerant pressure sensor terminal 3 and engine ground. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 6.

NG >> GO TO 5.

REFRIGERANT PRESSURE SENSOR

[TYPE 1]

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5.	DETECT MALFUNCTIONING PART	А
Ch	eck the following. Harness connectors E10, F1	
•	Joint connector-3	EC
•	Harness for open or short between ECM and refrigerant pressure sensor	
	>> Repair open circuit or short to ground or short to power in harness or connectors.	С
6.	CHECK REFRIGERANT PRESSURE SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT	D
1.	Disconnect ECM harness connector.	<u> </u>
2.	Check harness continuity between ECM terminal 81 and refrigerant pressure sensor terminal 2. Refe Wiring Diagram.	r to ⊟
	Continuity should exist.	
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<u>/.</u>	DETECT MALFUNCTIONING PART	
Cho	eck the following. Harness connectors E10, F1	Н
•	Harness for open or short between ECM and refrigerant pressure sensor	1
	>> Repair open circuit or short to ground or short to power in harness or connectors.	
8.	CHECK INTERMITTENT INCIDENT	J
	fer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".	
OK O N		K
	emoval and Installation FRIGERANT PRESSURE SENSOR	S000IC

Revision; 2004 April **EC-621** 2003 G35 Sedan

Refer to ATC-166, "Removal and Installation of Refrigerant Pressure Sensor" .

[TYPE 1]

ELECTRICAL LOAD SIGNAL

PFP:25350

Description

ABSOCOLO

The electrical load signal (Headlamp switch signal, rear window defogger switch signal, etc.) is transferred through the CAN communication line from BCM to ECM via IPDM E/R.

CONSULT-II Reference Value in Data Monitor Mode

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Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
LOAD SIGNAL	• Ignition switch: ON	Rear window defogger switch is ON and/or lighting switch is in 2nd.	ON
LOAD GIONAL	GNAL • Ignition switch: ON	Rear window defogger switch is OFF and lighting switch is OFF.	OFF

Diagnostic Procedure

ABS000IF

1. CHECK LOAD SIGNAL CIRCUIT OVERALL FUNCTION-I

- Turn ignition switch "ON".
- 2. Connect CONSULT-II and select "DATA MONITOR" mode.
- Select "LOAD SIGNAL" and check indication under the following conditions.

Condition	Indication
Rear window defogger switch "ON"	ON
Rear window defogger switch "OFF"	OFF

DATA MONITOR MONITORING NO DTC LOAD SIGNAL PBIB0103E

OK or NG

OK >> GO TO 2. NG >> GO TO 3.

2. CHECK LOAD SIGNAL CIRCUIT OVERALL FUNCTION-II

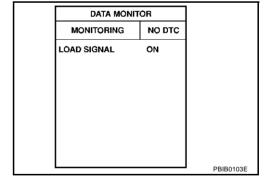
Check "LOAD SIGNAL" indication under the following conditions.

Condition	Indication
Lighting switch "ON" at 2nd position	ON
Lighting switch "OFF"	OFF

OK or NG

OK >> INSPECTION END

NG >> GO TO 4.



3. CHECK REAR WINDOW DEFOGGER SYSTEM

Refer to GW-99, "REAR WINDOW DEFOGGER".

>> INSPECTION END

4. CHECK HEADLAMP SYSTEM

Refer to LT-7, "HEADLAMP (FOR USA)" or LT-33, "HEADLAMP (FOR CANADA) - DAYTIME LIGHT SYS-TEM -".

>> INSPECTION END

ASCD BRAKE SWITCH

[TYPE 1]

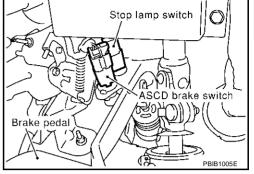
ASCD BRAKE SWITCH

PFP:25320

Component Description

ABS000IF

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 this input of two kinds (ON/OFF signal). Refer to EC-650, "AUTOMATIC SPEED CONTROL DEVICE (ASCD)" for the ASCD function.



CONSULT-II Reference Value in Data Monitor Mode

ABS000IG

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
BRAKE SW 1	Ignition switch: ON	Brake pedal fully released	ON
(ASCD brake switch)	• Ignition switch. ON	Brake pedal depressed	OFF
BRAKE SW 2	Ignition switch: ON	Brake pedal fully released	OFF
(stop lamp switch)	• Igrillion Switch. ON	Brake pedal depressed	ON

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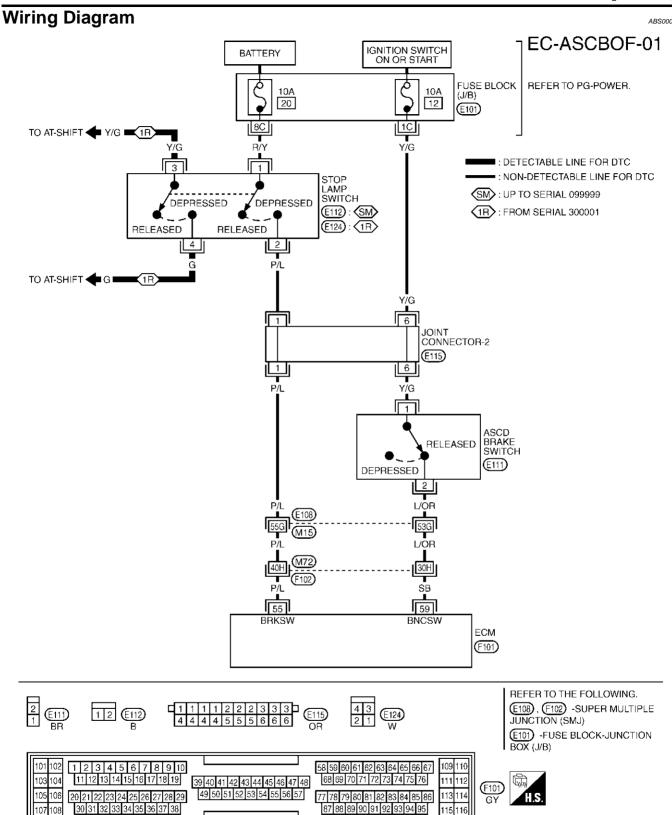
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Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
55 P/L	D/I	Stop lamp switch	[Ignition switch "ON"] • Brake pedal is fully released	Approximately 0V
	P/L		[Ignition switch "ON"] • Brake pedal is depressed	BATTERY VOLTAGE (11 - 14V)
59	SB	B ASCD brake switch	[Ignition switch "ON"] • Brake pedal is depressed	Approximately 0V
			[Ignition switch "ON"] • Brake pedal is fully released	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

1. CHECK OVERALL FUNCTION-I

(II) With CONSULT-II

- 1. Turn ignition switch "ON".
- 2. Select "BRAKE SW1" in "DATA MONITOR" mode with CONSULT-II.
- 3. Check "BRAKE SW1" indication under the following conditions.

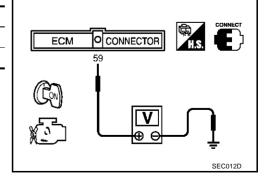
CONDITION	INDICATION
When brake pedal is depressed	OFF
When brake pedal is fully released	ON

DATA MONITOR	
MONITOR	NO DTC
BRAKE SW1	OFF

Without CONSULT-II

- 1. Turn ignition switch "ON".
- 2. Check voltage between ECM terminal 59 and ground under the following conditions.

CONDITION	VOLTAGE
When brake pedal is depressed	Approximately 0V
When brake pedal is fully released	Battery voltage



OK or NG

OK >> GO TO 2.

NG >> GO TO 3.

2. CHECK OVERALL FUNCTION-II

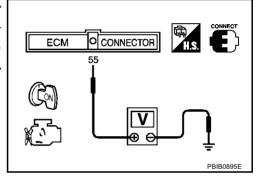
(B) With CONSULT-II Check "BRAKE SW2" indication in "DATA MONITOR" mode.

CONDITION	INDICATION	
When brake pedal is released	OFF	
When brake pedal is depressed	ON	

DATA MONITOR		
MONITOR	NO DTC	
BRAKE SW2	OFF	
		SEC013D

Without CONSULT-II Check voltage between ECM terminal 55 and ground under the following conditions.

CONDITION	VOLTAGE	
When brake pedal is released	Approximately 0V	
When brake pedal is depressed	Battery voltage	



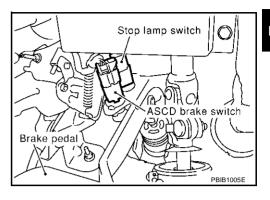
OK or NG

OK >> INSPECTION END

NG >> GO TO 8.

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".

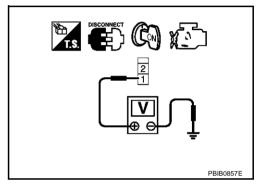


4. Check voltage between ASCD brake switch terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 5. NG >> GO TO 4.



4. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E101
- 10A fuse
- Joint connector-2
- Harness for open or short between ASCD brake switch and fuse
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK ASCD BRAKE SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch "OFF".
- 2. Disconnect ECM harness connector.
- Check harness continuity between ECM terminal 59 and ASCD brake switch terminal 2. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 7.

NG >> GO TO 6.

Revision; 2004 April EC-627 2003 G35 Sedan

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6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, F15
- Harness connectors M72, F102
- Harness for open or short between ECM and ASCD brake switch
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK ASCD BRAKE SWITCH

Refer to EC-629, "Component Inspection"

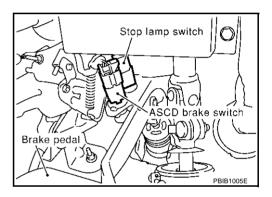
OK or NG

OK >> GO TO 13.

NG >> Replace ASCD brake switch.

8. CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT

- 1. Turn ignition switch "OFF".
- 2. Disconnect stop lamp switch harness connector.

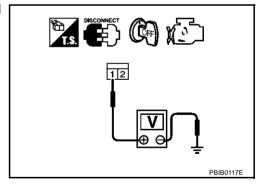


3. Check voltage between stop lamp switch terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 10. NG >> GO TO 9.



9. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E101
- 10A fuse
- Harness for open or short between stop lamp switch and fuse
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

[TYPE 1]

10. CHECK STOP LAMP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Disconnect ECM harness connector.
- 2. Check harness continuity between ECM terminal 55 and stop lamp switch terminal 2. Refer to Wiring Diagram.

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Continuity should exist.

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

OK or NG

OK >> GO TO 12. NG >> GO TO 11.



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11. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness connectors M72, F102
- Joint connector-2
- Harness for open or short between ECM and stop lamp switch
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

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12. CHECK STOP LAMP SWITCH

Refer to EC-629, "Component Inspection".

OK or NG

OK >> GO TO 13.

NG >> Replace stop lamp switch.

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13. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

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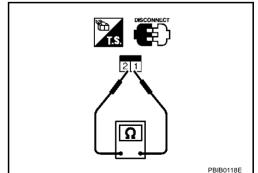
>> INSPECTION END

Component Inspection STOP LAMP SWITCH (UP TO SERIAL 099999)

- 1. Turn ignition switch "OFF".
- Disconnect stop lamp switch harness connector.
- Check harness continuity between stop lamp switch terminals 1 and 2 under the following conditions.

Condition	Continuity	
When brake pedal is fully released.	Should not exist.	
When brake pedal is depressed.	Should exist.	

If NG, adjust stop lamp switch installation, refer to <u>BR-6, "BRAKE PEDAL"</u>, and perform step 3 again.



STOP LAMP SWITCH (FROM SERIAL 300001)

- 1. Turn ignition switch "OFF".
- 2. Disconnect stop lamp switch harness connector.

Revision; 2004 April EC-629 2003 G35 Sedan

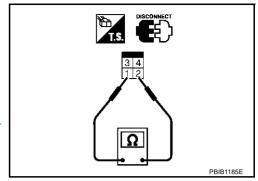
ASCD BRAKE SWITCH

[TYPE 1]

3. Check harness continuity between stop lamp switch terminals 1 and 2 under the following conditions.

Condition	Continuity	
When brake pedal is fully released.	Should not exist.	
When brake pedal is depressed.	Should exist.	

If NG, adjust stop lamp switch installation, refer to <u>BR-6</u>, <u>"BRAKE PEDAL"</u>, and perform step 3 again.



ASCD INDICATOR

[TYPE 1]

PFP:24814

ASCD INDICATOR

Component Description

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ASCD indicator lamp illuminates to indicate ASCD operation status. Lamp has two indicators, CRUISE and SET, and is integrated in combination meter.

CRUISE indicator illuminates when CRUISE switch on ASCD steering switch is turned ON to indicated that ASCD system is ready for operation.

SET indicator illuminates when following conditions are met.

- CRUISE indicator is illuminated.
- SET switch on ASCD steering switch is turned ON while vehicle speed is within the range of ASCD setting.

SET indicator remains lit during ASCD control.

Refer to EC-650, "AUTOMATIC SPEED CONTROL DEVICE (ASCD)" for the ASCD function.

CONSULT-II Reference Value in Data Monitor Mode

ABS000IK

Specification data are reference value.

MONITOR ITEM	CONDITION		SPECIFICATION
CRUISE LAMP	Ignition switch: ON	CRUISE switch pressed	ON
		CRUISE switch released	OFF
SET LAMP	CRUISE switch: ON	COAST/SET switch pressed	ON
	When vehicle speed is between 40 km/h (25 MPH) and 144 km/h (89 MPH)	COAST/SET switch released	OFF

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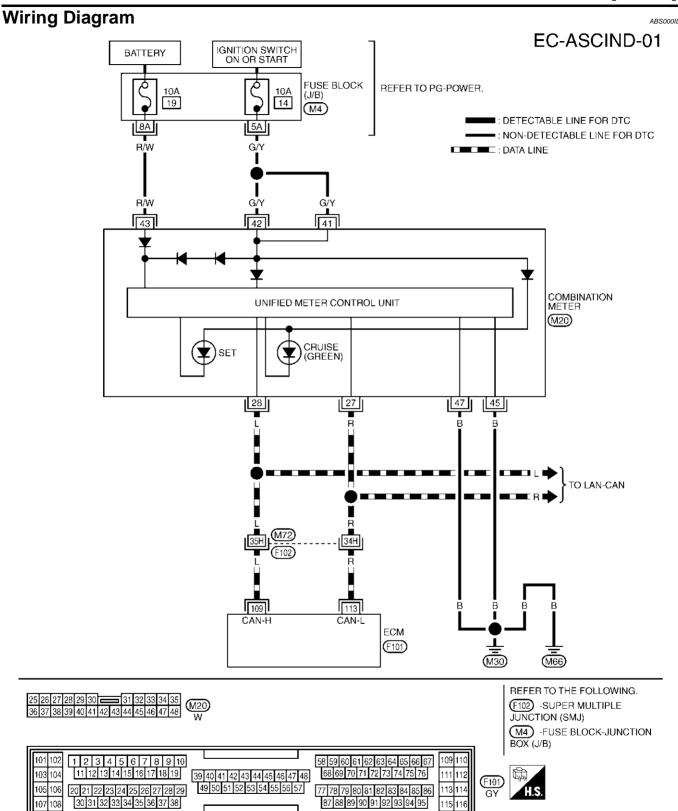
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TBWT0184E

ASCD INDICATOR

[TYPE 1]

Diagnostic Procedure

1. CHECK OVERALL FUNCTION

Check ASCD indicator under the following conditions.

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ACCO INDICATOR			
ASCD INDICATOR	CONDITION		SPECIFICATION
CRUISE LAMP	Ignition switch: ON	CRUISE switch pressed	ON
		CRUISE switch released	OFF
	CRUISE switch: ON	COAST/SET switch pressed	ON
SET LAMP	 When vehicle speed is between 40 km/h (25 MPH) 	COAST/SET switch released	OFF

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OK or NG

OK >> INSPECTION END

NG >> GO TO 2.

2. CHECK DTC

Check that DTC U1000 or U1001 is not displayed.

OK or NG

OK >> GO TO 3. NG >> Perform to G

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>> Perform trouble diagnoses for DTC U1000, U1001. Refer to <u>EC-142, "DTC U1000, U1001 CAN COMMUNICATION LINE"</u>.

3. CHECK COMBINATION METER OPERATION

Does combination meter operate normally?

Yes or No

Yes >> GO TO 4.

No >> Check combination meter circuit. Refer to <u>DI-4, "COMBINATION METERS"</u>.

4. CHECK INTERMITTENT INCIDENT

Refer to EC-135, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

and 144 km/h (89 MPH)

>> INSPECTION END

DATA LINK CONNECTOR

PFP:24814

Wiring Diagram

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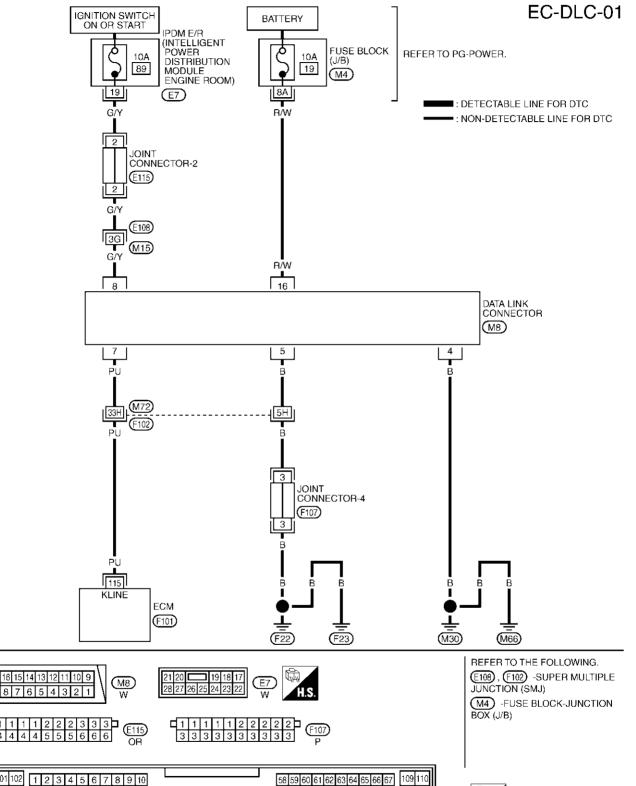
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20 21 22 23 24 25 26 27 28 29

30 31 32 33 34 35 36 37 38

ABS000IN



TBWT0185E

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EVAPORATIVE EMISSION SYSTEM

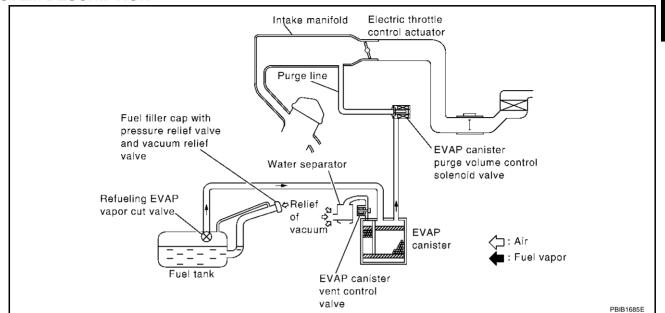
[TYPE 1]

EVAPORATIVE EMISSION SYSTEM

PFP:14950

Description SYSTEM DESCRIPTION

ABS000IO



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.

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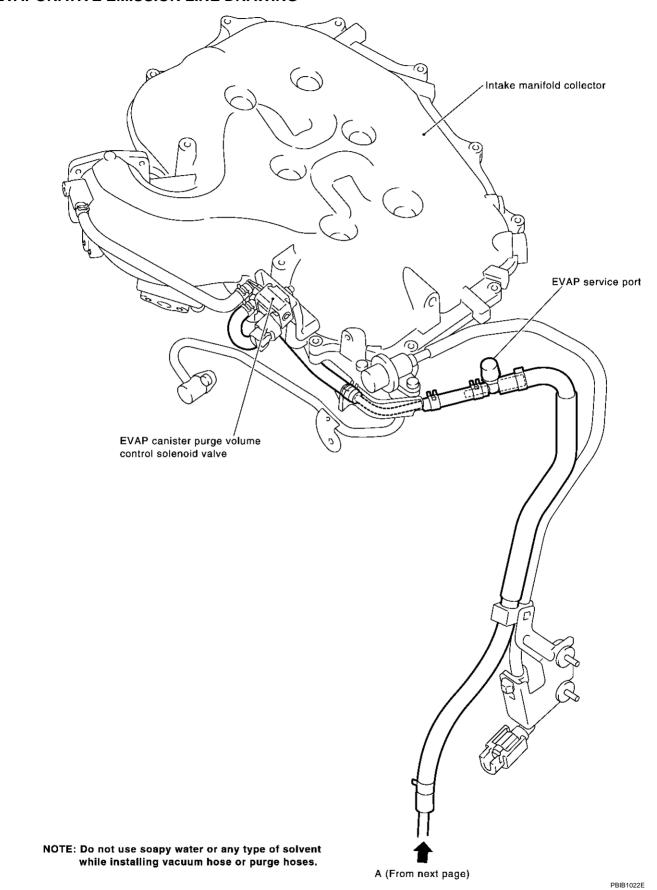
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EVAPORATIVE EMISSION LINE DRAWING



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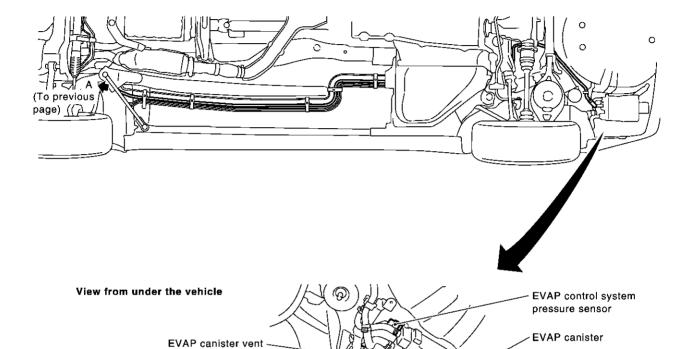
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control valve

Water separator

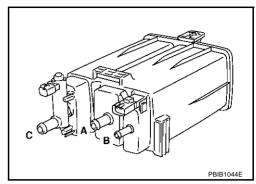
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Component Inspection EVAP CANISTER

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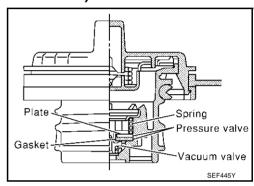
Check EVAP canister as follows:

- 1. Block port B.
- 2. Blow air into port A and check that it flows freely out of port C.
- Release blocked port B.
- 4. Apply vacuum pressure to port ${\bf B}$ and check that vacuum pressure exists at the ports ${\bf A}$ and ${\bf C}$.
- 5. Block port A and B.
- 6. Apply pressure to port **C** and check that there is no leakage.



FUEL TANK VACUUM RELIEF VALVE (BUILT INTO FUEL FULLER CAP)

1. Wipe clean valve housing.



2. Check valve opening pressure and vacuum.

Pressure: 15.3 - 20.0 kPa (0.156 - 0.204 kg/cm², 2.22 -

2.90 psi)

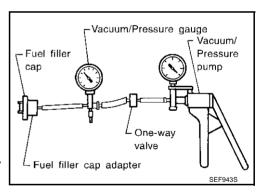
Vacuum: -6.0 to -3.3 kPa (-0.061 to -0.034 kg/cm², -

0.87 to -0.48 psi)

3. If out of specification, replace fuel filler cap as an assembly.

CAUTION:

Use only a genuine fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the MIL may come on.



EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-368.

FUEL TANK TEMPERATURE SENSOR

Refer to EC-289.

EVAP CANISTER VENT CONTROL VALVE

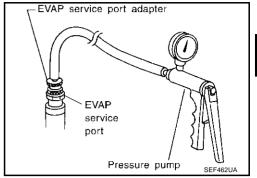
Refer to EC-374.

EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-384.

EVAP SERVICE PORT

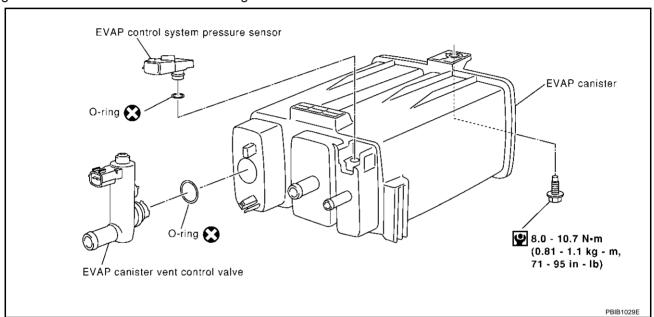
Positive pressure is delivered to the EVAP system through the EVAP service port. If fuel vapor leakage in the EVAP system occurs, use a leak detector to locate the leak.



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Removal and Installation **EVAP CANISTER**

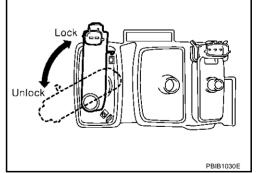
Tighten EVAP canister as shown in the figure.



EVAP CANISTER VENT CONTROL VALVE

- Turn EVAP canister vent control valve counterclockwise.
- 2. Remove the EVAP canister vent control valve.

Do not reuse the O-ring, replace it with a new one.



How to Detect Fuel Vapor Leakage

CAUTION:

- Never 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 to the EVAP service port may cause a leak.

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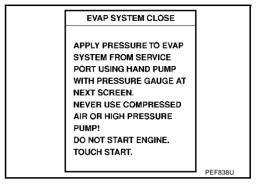
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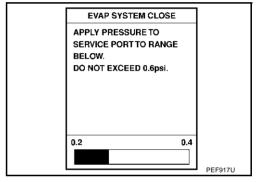
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(A) WITH CONSULT-II

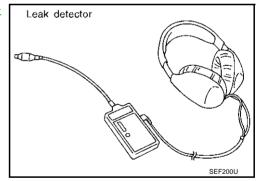
- 1. Attach the EVAP service port adapter securely to the EVAP service port.
- 2. Also attach the pressure pump and hose to the EVAP service port adapter.
- 3. Turn ignition switch "ON".
- Select the "EVAP SYSTEM CLOSE" of "WORK SUPPORT MODE" with CONSULT-II.
- 5. Touch "START". A bar graph (Pressure indicating display) will appear on the screen.



- 6. Apply positive pressure to the EVAP system until the pressure indicator reaches the middle of the bar graph.
- 7. Remove EVAP service port adapter and hose with pressure pump.

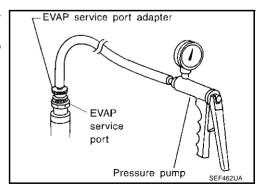


8. Locate the leak using a leak detector. Refer to EC-636, "EVAP-ORATIVE EMISSION LINE DRAWING".



M WITHOUT CONSULT-II

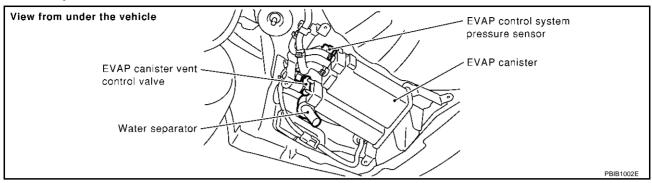
- 1. Attach the EVAP service port adapter securely to the EVAP service port.
- Also attach the pressure pump with pressure gauge to the EVAP service port adapter.



EVAPORATIVE EMISSION SYSTEM

[TYPE 1]

3. Apply battery voltage to between the terminals of EVAP canister vent control valve to make a closed EVAP system.



- 4. 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).
- 5. Remove EVAP service port adapter and hose with pressure pump.
- 6. Locate the leak using a leak detector. Refer to EC-636, "EVAPORATIVE EMISSION LINE DRAWING" .

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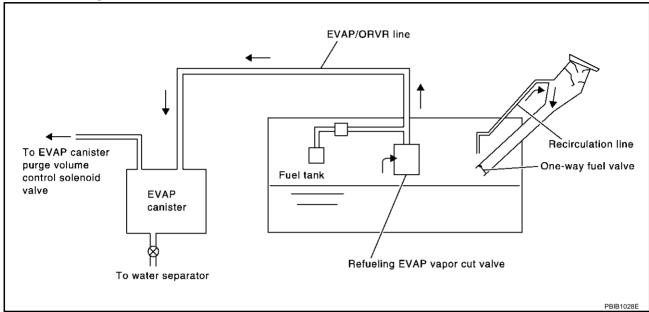
[TYPE 1]

ON BOARD REFUELING VAPOR RECOVERY (ORVR)

PFP:00032

System Description

ABS000IR



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: INFLAMMABLE" sign in workshop.
- Do not smoke while servicing fuel system. Keep open flames and sparks away from work area.
- Be sure to 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 "Fuel Pressure Release", <u>EC-53</u>.
- Disconnect battery ground cable.
- Always replace O-ring when the fuel gauge retainer is removed.
- Do not kink or twist hose and tube when they are installed.
- Do not tighten hose and clamps excessively to avoid damaging hoses.
- After installation, run engine and check for fuel leaks at connection.
- Do not 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.

ON BOARD REFUELING VAPOR RECOVERY (ORVR)

[TYPE 1]

Diagnostic Procedure

SYMPTOM: FUEL ODOR FROM EVAP CANISTER IS STRONG.

ABS000IS

1. 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).

OK or NG

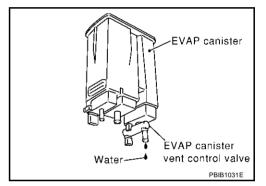
OK >> GO TO 2. NG >> GO TO 3.

2. CHECK IF EVAP CANISTER SATURATED WITH WATER

Does water drain from the EVAP canister?

Yes or No

Yes >> GO TO 3. No >> GO TO 6.



3. REPLACE EVAP CANISTER

Replace EVAP canister with a new one.

>> GO TO 4.

4. CHECK WATER SEPARATOR

Refer to EC-645, "Component Inspection".

OK or NG

OK >> GO TO 5.

NG >> Replace water separator.

5. DETECT MALFUNCTIONING PART

Check the EVAP hose between EVAP canister and water separator for clogging or poor connection.

>> Repair or replace EVAP hose.

6. CHECK REFUELING EVAP VAPOR CUT VALVE

Refer to EC-645, "Component Inspection".

OK or NG

OK >> INSPECTION END

NG >> Replace refueling EVAP vapor cut valve with fuel tank.

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[TYPE 1]

SYMPTOM: CANNOT REFUEL/FUEL ODOR FROM THE FUEL FILLER OPENING IS STRONG WHILE REFUELING.

1. 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).

OK or NG

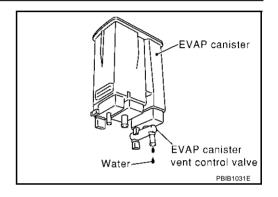
OK >> GO TO 2. NG >> GO TO 3.

$2.\,$ check if evap canister saturated with water

Does water drain from the EVAP canister?

Yes or No

Yes >> GO TO 3. No >> GO TO 6.



3. REPLACE EVAP CANISTER

Replace EVAP canister with a new one.

>> GO TO 4.

4. CHECK WATER SEPARATOR

Refer to EC-645, "Component Inspection".

OK or NG

OK >> GO TO 5.

NG >> Replace water separator.

5. DETECT MALFUNCTIONING PART

Check the EVAP hose between EVAP canister and water separator for clogging or poor connection.

>> Repair or replace EVAP hose.

6. CHECK VENT HOSES AND VENT TUBES

Check hoses and tubes between EVAP canister and refueling control valve for clogging, kink, looseness and improper connection.

OK or NG

OK >> GO TO 7.

NG >> Repair or replace hoses and tubes.

ON BOARD REFUELING VAPOR RECOVERY (ORVR)

[TYPE 1]

7. CHECK FILLER NECK TUBE

Check recirculation line for clogging, dents and cracks.

OK or NG

OK >> GO TO 8.

NG >> Replace filler neck tube.

8. CHECK REFUELING EVAP VAPOR CUT VALVE

Refer to EC-645, "Component Inspection".

OK or NG

OK >> GO TO 9.

NG >> Replace refueling EVAP vapor cut valve with fuel tank.

9. CHECK FUEL FILLER TUBE

Check filler neck tube and hose connected to the fuel tank for clogging, dents and cracks.

OK or NG

OK >> GO TO 10.

NG >> Replace fuel filler tube.

10. CHECK ONE-WAY FUEL VALVE-I

Check one-way valve for clogging.

OK or NG

OK >> GO TO 11.

NG >> Repair or replace one-way fuel valve with fuel tank.

11. CHECK ONE-WAY FUEL VALVE-II

- 1. Make sure that fuel is drained from the tank.
- 2. Remove fuel filler tube and hose.
- 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.

OK or NG

OK >> INSPECTION END

NG >> Replace fuel filler tube or replace one-way fuel valve with fuel tank.

One-way fuel valve Fuel tank

ABS000IT

Component Inspection WATER SEPARATOR

- 1. Check visually for insect nests in the water separator air inlet.
- Check visually for cracks or flaws in the appearance.
- Check visually for cracks or flaws in the hose.

Revision; 2004 April EC-645 2003 G35 Sedan

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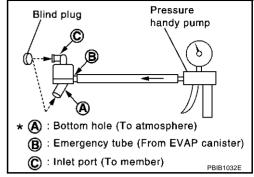
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- 4. Check that **A** and **C** are not clogged by blowing air into **B** with **A**, and then **C** plugged.
- 5. In case of NG in items 2 4, replace the parts.

NOTE:

Do not disassemble water separator.



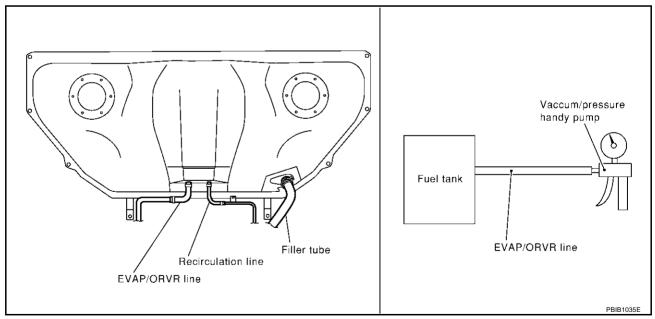
REFUELING EVAP VAPOR CUT VALVE

(P) With CONSULT-II

- 1. Remove fuel tank. Refer to FL-12, "FUEL TANK" .
- 2. Drain fuel from the tank as follows:
- Remove fuel feed hose located on the fuel gauge retainer.
- b. Connect a spare fuel hose, one side to fuel gauge retainer where the hose was removed and the other side to a fuel container.
- c. Drain fuel using "FUEL PUMP RELAY" in "ACTIVE TEST" mode with CONSULT-II.
- 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.
- 4. Check refueling EVAP vapor cut valve for being stuck to open as follows.
- a. Connect vacuum pump to hose end.
- b. Remove fuel gauge retainer with fuel gauge unit.

Always replace O-ring with new one.

- c. Put fuel tank upside down.
- d. Apply vacuum pressure to hose end [-13.3 kPa (-100 mmHg, -3.94 inHg)] with fuel gauge retainer remaining open and check that the pressure is applicable.



⋈ Without CONSULT-II

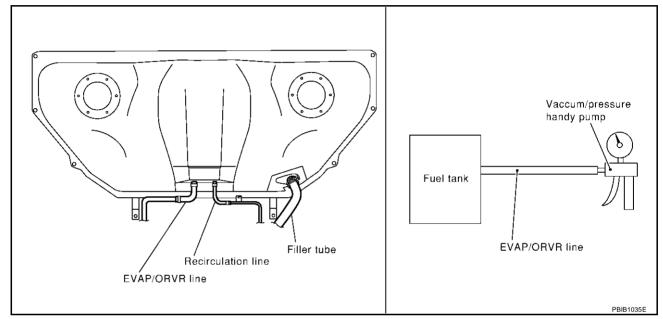
- 1. Remove fuel tank. Refer to FL-12, "FUEL TANK".
- 2. Drain fuel from the tank as follows:
- Remove fuel gauge retainer.
- b. Drain fuel from the tank using a handy pump into a fuel container.
- 3. Check refueling EVAP vapor cut valve for being stuck to close as follows.

ON BOARD REFUELING VAPOR RECOVERY (ORVR)

[TYPE 1]

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.

- 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.
- Put fuel tank upside down.
- Apply vacuum pressure to hose end [-13.3 kPa (-100 mmHg, -3.94 inHg)] with fuel gauge retainer remaining open and check that the pressure is applicable.



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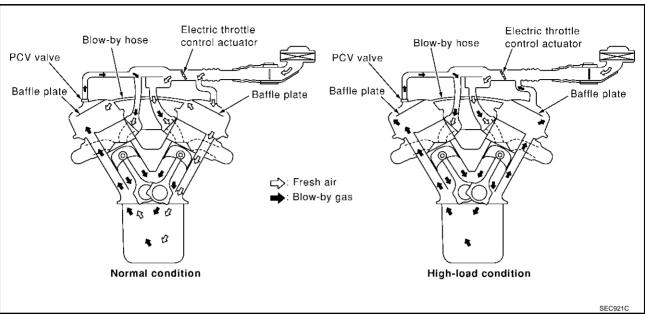
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POSITIVE CRANKCASE VENTILATION

PFP:11810

Description SYSTEM DESCRIPTION

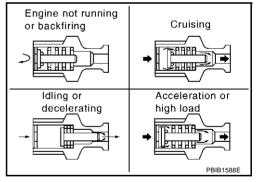
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This system returns blow-by gas to the intake manifold.

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 then 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.

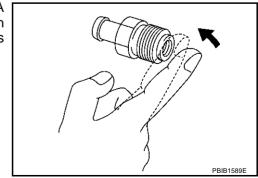
On vehicles with an excessively high blow-by, the valve does not meet the requirement. This is because some of the flow will go through the hose connection to the air inlet tubes under all conditions.



ABS000IV

Component Inspection PCV (POSITIVE CRANKCASE VENTILATION) VALVE

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.

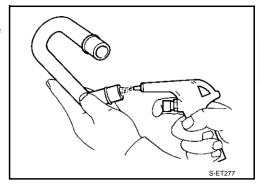


POSITIVE CRANKCASE VENTILATION

[TYPE 1]

PCV VALVE VENTILATION HOSE

- 1. Check hoses and hose connections for leaks.
- 2. Disconnect all hoses and clean with compressed air. If any hose cannot be freed of obstructions, replace.



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AUTOMATIC SPEED CONTROL DEVICE (ASCD)

[TYPE 1]

AUTOMATIC SPEED CONTROL DEVICE (ASCD)

System Description INPUT/OUTPUT SIGNAL CHART

ABS000IW

PFP:18930

Sensor	Input signal to ECM	ECM function	Actuator		
ASCD brake switch	Brake pedal operation				
Stop lamp switch	Brake pedal operation	ASCD vehicle speed control Electric throttle control actuator			
ASCD steering switch	ASCD steering switch operation		Floctric throttle control		
Park/Neutral position (PNP) switch	Gear position				
Combination meter	Vehicle speed				
TCM	Powertrain revolution				

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 ASCD system, it automatically deactivates control.

NOTE:

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

SET OPERATION

Press ASCD CRUISE switch (Main switch). (The CRUISE indicator in combination meter illuminates.) When vehicle speed reaches a desired speed between approximately 40 km/h (25 MPH) and 144 km/h (89 MPH), press SET switch. (Then SET indicator in combination meter illuminates.)

ACCEL OPERATION

If the RESUME/ACCEL 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 keep the new set speed.

CANCEL OPERATION

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

- CANCEL switch is depressed
- More than 2 switches at ASCD steering switch are pressed at the same time (Set speed will be cleared)
- Brake pedal is depressed
- Selector lever is changed to "N", "P", "R" position
- Vehicle speed decreased to 13 km/h (8 MPH) lower than the set speed
- VDC/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 indicator 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 switch or RESUME switch.
- Malfunction for some self-diagnoses regarding ASCD control: SET lamp will blink quickly.

If MAIN switch is turned to OFF during 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 keep the new set speed.

AUTOMATIC SPEED CONTROL DEVICE (ASCD)

[TYPE 1]

RESUME OPERATION

When the RESUME/ACCEL switch is pressed after cancel operation other than pressing MAIN switch is performed, 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 other than P and N positions
- Vehicle speed is greater than 40 km/h (25 MPH) and less than 144 km/h (89 MPH)

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AUTOMATIC SPEED CONTROL DEVICE (ASCD)

[TYPE 1]

ABS000IX

Component Description ASCD STEERING SWITCH

Refer to EC-560.

ASCD BRAKE SWITCH

Refer to EC-567, and EC-623.

STOP LAMP SWITCH

Refer to EC-567, EC-584 and EC-623.

ELECTRIC THROTTLE CONTROL ACTUATOR

Refer to $\underline{\mathsf{EC-451}}$, $\underline{\mathsf{EC-453}}$, $\underline{\mathsf{EC-460}}$ and $\underline{\mathsf{EC-465}}$.

ASCD INDICATOR

Refer to EC-631.

SERVICE DATA AND SPECIFICATIONS (SDS)

[TYPE 1]

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	SPECIFICATIONS (SD	8)	PFP:00030
Fuel Pressure			ABS000I
Fuel pressure at idling kPa (kg/cm ²	, psi)	Approximately 350 (3.57, 51)	
Idle Speed and Ignitio	n Timing		ABS000
Target idle speed	No-load* (in "P" or N" posit	ion) 650±50 rpm	
Air conditioner: ON	In "P" or N" position	775 rpm or more	
Ignition timing	In "P" or N" position	15° ± 5° BTDC	
*: Under the following conditions:		·	
Air conditioner switch: OFF			
Electric load: OFF (Lights, heater to	'		
Steering wheel: Kept in straight-ah			
Calculated Load Value)		ABS000
Conditio	ns	Calculated load value % (Using CONSULT-II or 0	GST)
At idle		10 - 35	
At 2,500 rpm		10 - 35	
Mass Air Flow Sensor	,		ABS000
Supply voltage		Battery voltage (11 - 14V)	
Output voltage at idle		1.1 - 1.5*V	
Mass air flow (Using CONSULT-II or	r GST)	2.0 - 6.0 g·m/sec at idle* 7.0 - 20.0 g·m/sec at 2,500 rpm*	
	·	7.0 - 20.0 g·m/sec at 2,500 rpm*	
: Engine is warmed up to normal ope	erating temperature and running und	7.0 - 20.0 g·m/sec at 2,500 rpm	ABS000.
: Engine is warmed up to normal ope	erating temperature and running und	7.0 - 20.0 g·m/sec at 2,500 rpm	ABS000.
: Engine is warmed up to normal ope	erating temperature and running und	7.0 - 20.0 g·m/sec at 2,500 rpm er no-load.	ABS000
: Engine is warmed up to normal ope Intake Air Temperature Temperature	erating temperature and running und	7.0 - 20.0 g·m/sec at 2,500 rpm er no-load. Resistance kΩ	ABS000.
: Engine is warmed up to normal operature Temperature 25 (77) 80 (176)	erating temperature and running und e Sensor °C (°F)	7.0 - 20.0 g·m/sec at 2,500 rpm er no-load. Resistance kΩ 1.9 - 2.1	
: Engine is warmed up to normal operature Temperature 25 (77) 80 (176)	erature Sensor	7.0 - 20.0 g·m/sec at 2,500 rpm er no-load. Resistance kΩ 1.9 - 2.1	
: Engine is warmed up to normal operature Temperature 25 (77) 80 (176) Engine Coolant Temperature	erature Sensor	7.0 - 20.0 g·m/sec at 2,500 rpm er no-load. Resistance kΩ 1.9 - 2.1 0.31 - 0.37	
: Engine is warmed up to normal operature Temperature 25 (77) 80 (176) Engine Coolant Temperature	erature Sensor	7.0 - 20.0 g·m/sec at 2,500 rpm er no-load.	
: Engine is warmed up to normal operature Temperature 25 (77) 80 (176) Engine Coolant Temperature Temperature 20 (68)	erature Sensor	7.0 - 20.0 g·m/sec at 2,500 rpm er no-load.	ABS000.
: Engine is warmed up to normal operature Temperature 25 (77) 80 (176) Engine Coolant Temperature 20 (68) 50 (122) 90 (194)	erature Sensor °C (°F) erature Sensor	$7.0 - 20.0 \text{ g·m/sec at 2,500 rpm}$ er no-load. $Resistance \ k\Omega$ $1.9 - 2.1$ $0.31 - 0.37$ $Resistance \ k\Omega$ $2.1 - 2.9$ $0.68 - 1.00$	
: Engine is warmed up to normal operature Temperature 25 (77) 80 (176) Engine Coolant Temperature 20 (68) 50 (122) 90 (194)	erature Sensor °C (°F) erature Sensor	$7.0 - 20.0 \text{ g·m/sec at 2,500 rpm}$ er no-load. $Resistance \ k\Omega$ $1.9 - 2.1$ $0.31 - 0.37$ $Resistance \ k\Omega$ $2.1 - 2.9$ $0.68 - 1.00$	ABS000.
: Engine is warmed up to normal operature Temperature 25 (77) 80 (176) Engine Coolant Temperature 20 (68) 50 (122) 90 (194) Heated Oxygen Sensor Resistance [at 25°C (77°F)]	erating temperature and running und e Sensor °C (°F) erature Sensor °C (°F) or 1 Heater	7.0 - 20.0 g·m/sec at 2,500 rpm er no-load. Resistance $k\Omega$ 1.9 - 2.1 0.31 - 0.37 Resistance $k\Omega$ 2.1 - 2.9 0.68 - 1.00 0.236 - 0.260	ABS000
: Engine is warmed up to normal operature Temperature 25 (77) 80 (176) Engine Coolant Temperature 20 (68) 50 (122) 90 (194) Heated Oxygen Senso Resistance [at 25°C (77°F)] Heated Oxygen senso	erating temperature and running und e Sensor °C (°F) erature Sensor °C (°F) or 1 Heater	7.0 - 20.0 g·m/sec at 2,500 rpm er no-load. Resistance $k\Omega$ 1.9 - 2.1 0.31 - 0.37 Resistance $k\Omega$ 2.1 - 2.9 0.68 - 1.00 0.236 - 0.260	ABS000
: Engine is warmed up to normal operature Temperature 25 (77) 80 (176) Engine Coolant Temperature 20 (68) 50 (122) 90 (194) Heated Oxygen Senso Resistance [at 25°C (77°F)] Heated Oxygen senso Resistance [at 25°C (77°F)]	erating temperature and running und e Sensor °C (°F) erature Sensor °C (°F) or 1 Heater or 2 Heater	7.0 - 20.0 g·m/sec at 2,500 rpm er no-load. Resistance $k\Omega$ 1.9 - 2.1 0.31 - 0.37 Resistance $k\Omega$ 2.1 - 2.9 0.68 - 1.00 0.236 - 0.260	ABS000
: Engine is warmed up to normal operature Temperature 25 (77) 80 (176) Engine Coolant Temperature 20 (68) 50 (122) 90 (194) Heated Oxygen Senso Resistance [at 25°C (77°F)] Heated Oxygen senso Resistance [at 25°C (77°F)] Crankshaft Position S	erating temperature and running und e Sensor °C (°F) erature Sensor °C (°F) or 1 Heater er 2 Heater ensor (POS)	7.0 - 20.0 g·m/sec at 2,500 rpm er no-load. Resistance $k\Omega$ 1.9 - 2.1 0.31 - 0.37 Resistance $k\Omega$ 2.1 - 2.9 0.68 - 1.00 0.236 - 0.260	ABS000
: Engine is warmed up to normal operature Temperature 25 (77) 80 (176) Engine Coolant Temperature 20 (68) 50 (122) 90 (194) Heated Oxygen Senso Resistance [at 25°C (77°F)] Heated Oxygen senso Resistance [at 25°C (77°F)] Crankshaft Position S Refer to EC-332, "Component	erating temperature and running und e Sensor °C (°F) erature Sensor °C (°F) or 1 Heater er 2 Heater ensor (POS) Inspection"	7.0 - 20.0 g·m/sec at 2,500 rpm er no-load. Resistance $k\Omega$ 1.9 - 2.1 0.31 - 0.37 Resistance $k\Omega$ 2.1 - 2.9 0.68 - 1.00 0.236 - 0.260	ABS000
: Engine is warmed up to normal operature Temperature 25 (77) 80 (176) Engine Coolant Temperature 20 (68) 50 (122) 90 (194) Heated Oxygen Senso Resistance [at 25°C (77°F)] Heated Oxygen senso Resistance [at 25°C (77°F)] Crankshaft Position Selection Sel	erating temperature and running und e Sensor °C (°F) erature Sensor °C (°F) or 1 Heater er 2 Heater ensor (POS) Inspection" nsor (PHASE)	7.0 - 20.0 g·m/sec at 2,500 rpm er no-load. Resistance $k\Omega$ 1.9 - 2.1 0.31 - 0.37 Resistance $k\Omega$ 2.1 - 2.9 0.68 - 1.00 0.236 - 0.260	ABS000 ABS000 ABS000
: Engine is warmed up to normal operature Intake Air Temperature 25 (77) 80 (176) Engine Coolant Temperature 20 (68) 50 (122) 90 (194) Heated Oxygen Sensor Resistance [at 25°C (77°F)] Heated Oxygen sensor Resistance [at 25°C (77°F)] Crankshaft Position Sensor Refer to EC-332, "Component Camshaft Position Sensor Refer to EC-341, "Component	erating temperature and running und e Sensor °C (°F) erature Sensor °C (°F) or 1 Heater er 2 Heater ensor (POS) Inspection" nsor (PHASE) Inspection"	7.0 - 20.0 g·m/sec at 2,500 rpm er no-load. Resistance $k\Omega$ 1.9 - 2.1 0.31 - 0.37 Resistance $k\Omega$ 2.1 - 2.9 0.68 - 1.00 0.236 - 0.260	ABS000
: Engine is warmed up to normal oper Intake Air Temperature 25 (77) 80 (176) Engine Coolant Temperature 20 (68) 50 (122) 90 (194) Heated Oxygen Sensor Resistance [at 25°C (77°F)] Heated Oxygen sensor Resistance [at 25°C (77°F)] Crankshaft Position Selection Select	erating temperature and running und e Sensor °C (°F) erature Sensor °C (°F) or 1 Heater er 2 Heater ensor (POS) Inspection" nsor (PHASE) Inspection"	7.0 - 20.0 g·m/sec at 2,500 rpm er no-load. Resistance $k\Omega$ 1.9 - 2.1 0.31 - 0.37 Resistance $k\Omega$ 2.1 - 2.9 0.68 - 1.00 0.236 - 0.260	ABS000 ABS000 ABS000

SERVICE DATA AND SPECIFICATIONS (SDS)

[TYPE 1]

Injector	ABS000J9
Resistance [at 10 – 60°C (50 – 140°F)]	13.5 - 17.5Ω
Fuel Pump	ABS000JA
Resistance [at 25°C (77°F)]	Approximately 1.0Ω

INDEX FOR DTC

[TYPE 2]

INDEX FOR DTC

PFP:00024

Alphabetical Index

ABS00804

Α

EC

С

D

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F

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M

NOTE:

If DTC U1000 or U1001 is displayed with other DTC, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-788, "DTC U1000, U1001 CAN COMMUNICATION LINE".

 \times :Applicable —: Not applicable

Items	DTC	C* ¹		MIL lighting	
(CONSULT-II screen terms)	CONSULT-II GST* ²	ECM* ³	Trip	up	Reference page
A/T INTERLOCK	P1730	1730	1	×	<u>AT-168</u>
A/T TCC S/V FNCTN	P0744	0744	2	×	<u>AT-127</u>
APP SEN 1/CIRC	P2122	2122	1	×	EC-1211
APP SEN 1/CIRC	P2123	2123	1	×	EC-1211
APP SEN 2/CIRC	P2127	2127	1	×	EC-1218
APP SEN 2/CIRC	P2128	2128	1	×	EC-1218
APP SENSOR	P2138	2138	1	×	EC-1232
ASCD BRAKE SW	P1572	1572	1	_	EC-1178
ASCD SW	P1564	1564	1	_	EC-1171
ASCD VHL SPD SEN	P1574	1574	1	_	EC-1195
ATF TEMP SEN/CIRC	P0710	0710	2	×	<u>AT-155</u>
BRAKE SW/CIRCUIT	P1805	1805	2	_	EC-1206
CAN COMM CIRCUIT	U1000	1000* ⁵	1	×	EC-788
CAN COMM CIRCUIT	U1001	1001* ⁵	2	_	EC-788
CKP SEN/CIRCUIT	P0335	0335	2	×	EC-949
CLOSED LOOP-B1	P1148	1148	1	×	EC-1119
CLOSED LOOP-B2	P1168	1168	1	×	EC-1119
CMP SEN/CIRC-B1	P0340	0340	2	×	EC-955
CMP SEN/CIRC-B2	P0345	0345	2	×	EC-955
CTP LEARNING	P1225	1225	2	_	EC-1147
CTP LEARNING	P1226	1226	2	_	EC-1149
CYL 1 MISFIRE	P0301	0301	2	×	EC-938
CYL 2 MISFIRE	P0302	0302	2	×	EC-938
CYL 3 MISFIRE	P0303	0303	2	×	EC-938
CYL 4 MISFIRE	P0304	0304	2	×	EC-938
CYL 5 MISFIRE	P0305	0305	2	×	EC-938
CYL 6 MISFIRE	P0306	0306	2	×	EC-938
D/C SOLENOID/CIRC	P1762	1762	1	×	<u>AT-198</u>
D/C SOLENOID FNCTN	P1764	1764	1	×	<u>AT-203</u>
ECM	P0605	0605	1 or 2	× or —	EC-1050
ECM BACK UP/CIRCUIT	P1065	1065	2	×	EC-1053
ECT SEN/CIRCUIT	P0117	0117	1	×	EC-830
ECT SEN/CIRCUIT	P0118	0118	1	×	EC-830
ECT SENSOR	P0125	0125	1	×	EC-842
ENG OVER TEMP	P1217	1217	1	×	EC-1123(A/T) EC-1135(M/T)
ENGINE SPEED SIG	P0725	0725	2	×	AT-120

Itomo	DTC	_* *1		NAIL E L-Ai-	
Items (CONSULT-II screen terms)	CONSULT-II GST* ²	ECM* ³	Trip	MIL lighting up	Reference page
ETC ACTR	P1121	1121	1	×	EC-1064
ETC FUNCTION/CIRC	P1122	1122	1	×	EC-1066
ETC MOT	P1128	1128	1	×	EC-1077
ETC MOT PWR	P1124	1124	1	×	EC-1072
ETC MOT PWR	P1126	1126	1	×	EC-1072
EVAP GROSS LEAK	P0455	0455	2	×	EC-1015
EVAP PURG FLOW/MON	P0441	0441	2	×	EC-969
EVAP SMALL LEAK	P0442	0442	2	×	EC-974
EVAP SYS PRES SEN	P0451	0451	2	×	EC-998
EVAP SYS PRES SEN	P0452	0452	2	×	EC-1001
EVAP SYS PRES SEN	P0453	0453	2	×	EC-1007
EVAP VERY SML LEAK	P0456	0456	2	×	EC-1023
FR/B SOLENOID/CIRC	P1757	1757	1	×	<u>AT-188</u>
FR/B SOLENOID FNCT	P1759	1759	1	×	<u>AT-193</u>
FTT SEN/CIRCUIT	P0182	0182	2	×	EC-927
FTT SEN/CIRCUIT	P0183	0183	2	×	EC-927
FTT SENSOR	P0181	0181	2	×	EC-922
FUEL LEV SEN SLOSH	P0460	0460	2	×	EC-1033
FUEL LEVEL SENSOR	P0461	0461	2	×	EC-1035
FUEL LEVL SEN/CIRC	P0462	0462	2	×	EC-1037
FUEL SYS-LEAN-B1	P0171	0171	2	×	EC-905
FUEL SYS-LEAN-B2	P0174	0174	2	×	EC-905
FUEL SYS-RICH-B1	P0172	0172	2	×	EC-914
FUEL SYS-RICH-B2	P0175	0175	2	×	EC-914
HLR/C SOL FNCTN	P1769	1769	1	×	<u>AT-212</u>
HLR/C SOL/CIRC	P1767	1767	1	×	<u>AT-207</u>
HO2S1 (B1)	P0132	0132	2	×	EC-850
HO2S1 (B1)	P0133	0133	2	×	EC-860
HO2S1 (B1)	P0134	0134	2	×	EC-873
HO2S1 (B1)	P1143	1143	2	×	EC-1082
HO2S1 (B1)	P1144	1144	2	×	EC-1088
HO2S1 (B2)	P0152	0152	2	×	EC-850
HO2S1 (B2)	P0153	0153	2	×	EC-860
HO2S1 (B2)	P0154	0154	2	×	EC-873
HO2S1 (B2)	P1163	1163	2	×	EC-1082
HO2S1 (B2)	P1164	1164	2	×	EC-1088
HO2S1 HTR (B1)	P0031	0031	2	×	EC-794
HO2S1 HTR (B1)	P0032	0032	2	×	EC-794
HO2S1 HTR (B2)	P0051	0051	2	×	EC-794
HO2S1 HTR (B2)	P0052	0052	2	×	EC-794
HO2S2 (B1)	P0138	0138	2	×	EC-883
HO2S2 (B1)	P0139	0139	2	×	EC-893

INDEX FOR DTC

[TYPE 2]

					[11762]	
	DT	C* ¹				
Items (CONSULT-II screen terms)	CONSULT-II GST* ²	ECM* ³	Trip	MIL lighting up	Reference page	А
HO2S2 (B1)	P1146	1146	2	×	EC-1095	EC
HO2S2 (B1)	P1147	1147	2	×	EC-1107	
HO2S2 (B2)	P0158	0158	2	×	EC-883	-
HO2S2 (B2)	P0159	0159	2	×	EC-893	С
HO2S2 (B2)	P1166	1166	2	×	EC-1095	-
HO2S2 (B2)	P1167	1167	2	×	EC-1107	D
HO2S2 HTR (B1)	P0037	0037	2	×	EC-802	
HO2S2 HTR (B1)	P0038	0038	2	×	EC-802	E v
HO2S2 HTR (B2)	P0057	0057	2	×	EC-802	Е
HO2S2 HTR (B2)	P0058	0058	2	×	EC-802	E v
I/C SOLENOID/CIRC	P1752	1752	1	×	<u>AT-179</u>	_
I/C SOLENOID FNCTN	P1754	1754	1	×	<u>AT-184</u>	F
IAT SEN/CIRCUIT	P0112	0112	2	×	EC-825	E v
IAT SEN/CIRCUIT	P0113	0113	2	×	EC-825	G
IAT SENSOR	P0127	0127	2	×	EC-845	-
INT/V TIM CONT-B1	P0011	0011	2	×	EC-791	
INT/V TIM CONT-B2	P0021	0021	2	×	EC-791	Н
INT/V TIM V/CIR-B1	P1111	1111	2	×	EC-1057	-
INT/V TIM V/CIR-B2	P1136	1136	2	×	EC-1057	
ISC SYSTEM	P0506	0506	2	×	EC-1041	-
ISC SYSTEM	P0507	0507	2	×	EC-1043	
KNOCK SEN/CIRC-B1	P0327	0327	2	_	EC-944	J
KNOCK SEN/CIRC-B1	P0328	0328	2	_	EC-944	-
L/PRESS SOL/CIRC	P0745	0745	2	×	<u>AT-132</u>	K
LC/B SOLENOID FNCT	P1774	1774	1	×	<u>AT-222</u>	
LC/B SOLENOID/CIRC	P1772	1772	1	×	<u>AT-217</u>	
MAF SEN/CIRCUIT	P0101	0101	1	×	EC-810	L
MAF SEN/CIRCUIT	P0102	0102	1	×	EC-818	
MAF SEN/CIRCUIT	P0103	0103	1	×	EC-818	M
MULTI CYL MISFIRE	P0300	0300	2	×	EC-938	IVI
NATS MALFUNCTION	P1610 - P1615	1610 - 1615	2	_	EC-712	=
NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED.	No DTC	Flashing* ⁴	_	Flashing* ⁴	EC-713	-
NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED.	P0000	0000	_	_	_	•
P-N POS SW/CIRCUIT	P1706	1706	2	×	EC-1197	=
PNP SW/CIRC	P0705	0705	2	×	<u>AT-110</u>	=
PURG VOLUME CONT/V	P0444	0444	2	×	EC-984	=
PURG VOLUME CONT/V	P0445	0445	2	×	EC-984	=
PURG VOLUME CONT/V	P1444	1444	2	×	EC-1156	=
PW ST P SEN/CIRC	P0550	0550	2	_	EC-1045	=
SENSOR POWER/CIRC	P1229	1229	1	×	EC-1151	-

EC-657 2003 G35 Sedan Revision; 2004 April

G

Homo	DT	C* ¹		MII limbii:	
Items (CONSULT-II screen terms)	CONSULT-II GST* ²	ECM* ³	Trip	MIL lighting up	Reference page
TCC SOLENOID/CIRC	P0740	0740	2	×	<u>AT-122</u>
TCS C/U FUNCTN	P1211	1211	2	_	EC-1121
TCS/CIRC	P1212	1212	2	_	EC-1122
THERMSTAT FNCTN	P0128	0128	2	×	EC-848
TP SEN 1/CIRC	P0222	0222	1	×	EC-931
TP SEN 1/CIRC	P0223	0223	1	×	EC-931
TP SEN 2/CIRC	P0122	0122	1	×	EC-835
TP SEN 2/CIRC	P0123	0123	1	×	EC-835
TP SEN/CIRC A/T	P1705	1705	1	×	<u>AT-152</u>
TP SENSOR	P2135	2135	1	×	EC-1225
TURBINE REV S/CIRC	P1716	1716	2	×	<u>AT-161</u>
TW CATALYST SYS-B1	P0420	0420	2	×	EC-964
TW CATALYST SYS-B2	P0430	0430	2	×	EC-964
VEH SPD SEN/CIR AT*6	P0720	0720	2	×	<u>AT-115</u>
VEH SPEED SEN/CIRC*6	P0500	0500	2	×	EC-1039
VENT CONTROL VALVE	P0447	0447	2	×	EC-991
VENT CONTROL VALVE	P1446	1446	2	×	EC-1164

^{*1: 1}st trip DTC No. is the same as DTC No.

^{*2:} This number is prescribed by SAE J2012.

^{*3:} In Diagnostic Test Mode II (Self-diagnostic results), this number is controlled by NISSAN.

^{*4:} When engine is running.

^{*5:} The troubleshooting for this DTC needs CONSULT-II.

^{*6:} When the fail-safe operations for both self-diagnoses occur, the MIL illuminates.

Α

EC

DTC No. Index

NOTE:

If DTC U1000 or U1001 is displayed with other DTC, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-788, "DTC U1000, U1001 CAN COMMUNICATION LINE".

×: Applicable —: Not applicable

DT	C* ¹	Homo		MII limbtion		
CONSULT-II GST* ²	ECM* ³	ltems (CONSULT-II screen terms)	Trip	MIL lighting up	Reference page	С
No DTC	Flashing* ⁴	NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED.	_	Flashing* ⁴	EC-713	D
U1000	1000*5	CAN COMM CIRCUIT	1	×	EC-788	
U1001	1001* ⁵	CAN COMM CIRCUIT	2	_	EC-788	Е
P0000	0000	NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED.	_	_	_	F
P0011	0011	INT/V TIM CONT-B1	2	×	EC-791	
P0021	0021	INT/V TIM CONT-B2	2	×	EC-791	
P0031	0031	HO2S1 HTR (B1)	2	×	EC-794	G
P0032	0032	HO2S1 HTR (B1)	2	×	EC-794	
P0037	0037	HO2S2 HTR (B1)	2	×	EC-802	Н
P0038	0038	HO2S2 HTR (B1)	2	×	EC-802	
P0051	0051	HO2S1 HTR (B2)	2	×	EC-794	
P0052	0052	HO2S1 HTR (B2)	2	×	EC-794	
P0057	0057	HO2S2 HTR (B2)	2	×	EC-802	
P0058	0058	HO2S2 HTR (B2)	2	×	EC-802	J
P0101	0101	MAF SEN/CIRCUIT	1	×	EC-810	0
P0102	0102	MAF SEN/CIRCUIT	1	×	EC-818	
P0103	0103	MAF SEN/CIRCUIT	1	×	EC-818	K
P0112	0112	IAT SEN/CIRCUIT	2	×	EC-825	
P0113	0113	IAT SEN/CIRCUIT	2	×	EC-825	
P0117	0117	ECT SEN/CIRCUIT	1	×	EC-830	_
P0118	0118	ECT SEN/CIRCUIT	1	×	EC-830	
P0122	0122	TP SEN 2/CIRC	1	×	EC-835	\mathbb{M}
P0123	0123	TP SEN 2/CIRC	1	×	EC-835	
P0125	0125	ECT SENSOR	1	×	EC-842	
P0127	0127	IAT SENSOR	2	×	EC-845	
P0128	0128	THERMSTAT FNCTN	2	×	EC-848	
P0132	0132	HO2S1 (B1)	2	×	EC-850	
P0133	0133	HO2S1 (B1)	2	×	EC-860	
P0134	0134	HO2S1 (B1)	2	×	EC-873	
P0138	0138	HO2S2 (B1)	2	×	EC-883	
P0139	0139	HO2S2 (B1)	2	×	EC-893	
P0152	0152	HO2S1 (B2)	2	×	EC-850	
P0153	0153	HO2S1 (B2)	2	×	EC-860	
P0154	0154	HO2S1 (B2)	2	×	EC-873	
P0158	0158	HO2S2 (B2)	2	×	EC-883	

DTC	*1				
CONSULT-II GST* ²	ECM* ³	Items (CONSULT-II screen terms)	Trip	MIL lighting up	Reference page
P0159	0159	HO2S2 (B2)	2	×	EC-893
P0171	0171	FUEL SYS-LEAN-B1	2	×	EC-905
P0172	0172	FUEL SYS-RICH-B1	2	×	EC-914
P0174	0174	FUEL SYS-LEAN-B2	2	×	EC-905
P0175	0175	FUEL SYS-RICH-B2	2	×	EC-914
P0181	0181	FTT SENSOR	2	×	EC-922
P0182	0182	FTT SEN/CIRCUIT	2	×	EC-927
P0183	0183	FTT SEN/CIRCUIT	2	×	EC-927
P0222	0222	TP SEN 1/CIRC	1	×	EC-931
P0223	0223	TP SEN 1/CIRC	1	×	EC-931
P0300	0300	MULTI CYL MISFIRE	2	×	EC-938
P0301	0301	CYL 1 MISFIRE	2	×	EC-938
P0302	0302	CYL 2 MISFIRE	2	×	EC-938
P0303	0303	CYL 3 MISFIRE	2	×	EC-938
P0304	0304	CYL 4 MISFIRE	2	×	EC-938
P0305	0305	CYL 5 MISFIRE	2	×	EC-938
P0306	0306	CYL 6 MISFIRE	2	×	EC-938
P0327	0327	KNOCK SEN/CIRC-B1	2	_	EC-944
P0328	0328	KNOCK SEN/CIRC-B1	2	_	EC-944
P0335	0335	CKP SEN/CIRCUIT	2	×	EC-949
P0340	0340	CMP SEN/CIRC-B1	2	×	EC-955
P0345	0345	CMP SEN/CIRC-B2	2	×	EC-955
P0420	0420	TW CATALYST SYS-B1	2	×	EC-964
P0430	0430	TW CATALYST SYS-B2	2	×	EC-964
P0441	0441	EVAP PURG FLOW/MON	2	×	EC-969
P0442	0442	EVAP SMALL LEAK	2	×	EC-974
P0444	0444	PURG VOLUME CONT/V	2	×	EC-984
P0445	0445	PURG VOLUME CONT/V	2	×	EC-984
P0447	0447	VENT CONTROL VALVE	2	×	EC-991
P0451	0451	EVAP SYS PRES SEN	2	×	EC-998
P0452	0452	EVAP SYS PRES SEN	2	×	EC-1001
P0453	0453	EVAP SYS PRES SEN	2	×	EC-1007
P0455	0455	EVAP GROSS LEAK	2	×	EC-1015
P0456	0456	EVAP VERY SML LEAK	2	×	EC-1023
P0460	0460	FUEL LEV SEN SLOSH	2	×	EC-1033
P0461	0461	FUEL LEVEL SENSOR	2	×	EC-1035
P0462	0462	FUEL LEVL SEN/CIRC	2	×	EC-1037
P0500	0500	VEH SPEED SEN/CIRC*6	2	×	EC-1039
P0506	0506	ISC SYSTEM	2	×	EC-1041
P0507	0507	ISC SYSTEM	2	×	EC-1043
P0550	0550	PW ST P SEN/CIRC	2		EC-1045
P0605	0605	ECM	1 or 2	× or —	EC-1050

INDEX FOR DTC

[TYPE 2]

DTC	1					
CONSULT-II GST* ²	ECM* ³	ltems (CONSULT-II screen terms)	Trip	MIL lighting up	Reference page	A
P0705	0705	PNP SW/CIRC	2	×	AT-110	
P0710	0710	ATF TEMP SEN/CIRC	2	×	AT-115	E
P0710						
	0720	VEH SPD SEN/CIR AT*6	2	×	AT-115	
P0725	0725	ENGINE SPEED SIG	2	×	<u>AT-120</u>	
P0740	0740	TCC SOLENOID/CIRC	2	×	AT-122	
P0744	0744	A/T TCC S/V FNCTN	2	×	<u>AT-127</u>	
P0745	0745	L/PRESS SOL/CIRC	2	×	<u>AT-132</u>	
P1065	1065	ECM BACK UP/CIRCUIT	2	×	EC-1053	Е
P1111	1111	INT/V TIM V/CIR-B1	2	×	EC-1057	_
P1121	1121	ETC ACTR	1	×	EC-1064	
P1122	1122	ETC FUNCTION/CIRC	1	×	EC-1066	F
P1124	1124	ETC MOT PWR	1	×	EC-1072	
P1126	1126	ETC MOT PWR	1	×	EC-1072	
P1128	1128	ETC MOT	1	×	EC-1077	
P1136	1136	INT/V TIM V/CIR-B2	2	×	EC-1057	
P1143	1143	HO2S1 (B1)	2	×	EC-1082	F
P1144	1144	HO2S1 (B1)	2	×	EC-1088	
P1146	1146	HO2S2 (B1)	2	×	EC-1095	
P1147	1147	HO2S2 (B1)	2	×	EC-1107	
P1148	1148	CLOSED LOOP-B1	1	×	EC-1119	
P1163	1163	HO2S1 (B2)	2	×	EC-1082	
P1164	1164	HO2S1 (B2)	2	×	EC-1088	
P1166	1166	HO2S2 (B2)	2	×	EC-1095	
P1167	1167	HO2S2 (B2)	2	×	EC-1107	K
P1168	1168	CLOSED LOOP-B2	1	×	EC-1119	
P1211	1211	TCS C/U FUNCTN	2	_	EC-1121	
P1212	1212	TCS/CIRC	2	_	EC-1122	L
P1217	1217	ENG OVER TEMP	1	×	<u>EC-1123(</u> A/T) <u>EC-1135(</u> M/T)	
P1225	1225	CTP LEARNING	2	_	EC-1147	N
P1226	1226	CTP LEARNING	2	_	EC-1149	
P1229	1229	SENSOR POWER/CIRC	1	×	EC-1151	
P1444	1444	PURG VOLUME CONT/V	2	×	EC-1156	
P1446	1446	VENT CONTROL VALVE	2	×	EC-1164	
P1564	1564	ASCD SW	1	_	EC-1171	
P1572	1572	ASCD BRAKE SW	1	_	EC-1178	
P1574	1574	ASCD VHL SPD SEN	1	_	EC-1195	
P1610 - P1615	1610 - 1615	NATS MALFUNCTION	2	_	EC-712	
P1705	1705	TP SEN/CIRC A/T	1	×	AT-152	
P1706	1706	P-N POS SW/CIRCUIT	2	×	EC-1197	
P1716	1716	TURBINE REV S/CIRC	2	×	AT-161	
P1730	1730	A/T INTERLOCK	1	×	AT-168	

INDEX FOR DTC

[TYPE 2]

DT	C* ¹	- Items		MIL lighting	
CONSULT-II GST* ²	ECM* ³	(CONSULT-II screen terms)	Trip	up	Reference page
P1752	1752	I/C SOLENOID/CIRC	1	×	<u>AT-179</u>
P1754	1754	I/C SOLENOID FNCTN	1	×	<u>AT-184</u>
P1757	1757	FR/B SOLENOID/CIRC	1	×	<u>AT-188</u>
P1759	1759	FR/B SOLENOID FNCT	1	×	<u>AT-193</u>
P1762	1762	D/C SOLENOID/CIRC	1	×	<u>AT-198</u>
P1764	1764	D/C SOLENOID FNCTN	1	×	<u>AT-203</u>
P1767	1767	HLR/C SOL/CIRC	1	×	<u>AT-207</u>
P1769	1769	HLR/C SOL FNCTN	1	×	<u>AT-212</u>
P1772	1772	LC/B SOLENOID/CIRC	1	×	<u>AT-217</u>
P1774	1774	LC/B SOLENOID FNCT	1	×	<u>AT-222</u>
P1805	1805	BRAKE SW/CIRCUIT	2	_	EC-1206
P2122	2122	APP SEN 1/CIRC	1	×	EC-1211
P2123	2123	APP SEN 1/CIRC	1	×	EC-1211
P2127	2127	APP SEN 2/CIRC	1	×	EC-1218
P2128	2128	APP SEN 2/CIRC	1	×	EC-1218
P2135	2135	TP SENSOR	1	×	EC-1225
P2138	2138	APP SENSOR	1	×	EC-1232

^{*1: 1}st trip DTC No. is the same as DTC No.

^{*2:} This number is prescribed by SAE J2012.

^{*3:} In Diagnostic Test Mode II (Self-diagnostic results), this number is controlled by NISSAN.

^{*4:} When engine is running.

^{*5:} The troubleshooting for this DTC needs CONSULT-II.

^{*6:} When the fail-safe operations for both self-diagnoses occur, the MIL illuminates.

[TYPE 2]

PRECAUTIONS PFP:00001

Precautions for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

A B C 0 0 0 0 0

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 and SB section of this Service Man-ual

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 section.
- 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.

On Board Diagnostic (OBD) System of Engine and A/T

ABS00808

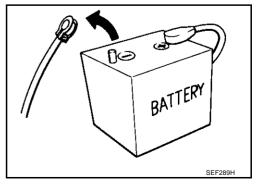
The ECM has an on board diagnostic system. It will light up the malfunction indicator lamp (MIL) to warn the driver of a malfunction causing emission deterioration.

CAUTION:

- Be sure to 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 light up.
- Be sure to connect and lock the connectors securely after work. A loose (unlocked) connector will cause the MIL to light up 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 slidelocking type harness connector. For description and how to disconnect, refer to <u>PG-66</u>, "<u>HAR-NESS CONNECTOR</u>".
- Be sure to route and secure the harnesses properly after work. The interference of the harness with a bracket, etc. may cause the MIL to light up due to the short circuit.
- Be sure to connect rubber tubes properly after work. A misconnected or disconnected rubber tube
 may cause the MIL to light up due to the malfunction of the EVAP system or fuel injection system,
 etc.
- Be sure to erase the unnecessary malfunction information (repairs completed) from the ECM and TCM (Transmission control module) before returning the vehicle to the customer.

Precaution

- Always use a 12 volt battery as power source.
- Do not attempt to disconnect battery cables while engine is running.
- Before connecting or disconnecting the ECM harness connector, turn ignition switch OFF and disconnect battery ground 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.



Revision; 2004 April EC-663 2003 G35 Sedan

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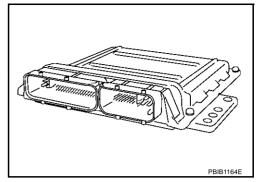
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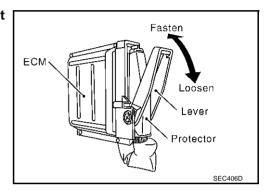
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- Do not disassemble ECM.
- If a battery cable is disconnected, the memory will return to the ECM value.

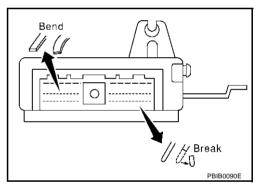
The ECM will now start to self-control at its initial value. Engine operation can vary slightly when the terminal is disconnected. However, this is not an indication of a malfunction. Do not replace parts because of a slight variation.

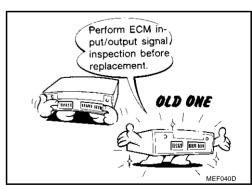


 When connecting ECM harness connector, fasten it securely with a lever as far as it will go as shown at right.

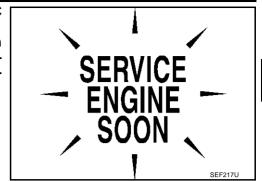


- When connecting or disconnecting pin connectors into or from ECM, take care not to damage pin terminals (bend or break).
 - Make sure that there are not any bends or breaks on ECM pin terminal, when connecting pin connectors.
- Securely connect ECM harness connectors.
 A poor connection can cause an 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-746.
- Handle mass air flow sensor carefully to avoid damage.
- Do not disassemble mass air flow sensor.
- Do not clean mass air flow sensor with any type of detergent.
- Do not disassemble electric throttle control actuator.
- Even a slight leak in the air intake system can cause serious incidents.
- Do not shock or jar the camshaft position sensor (PHASE), crankshaft position sensor (POS).

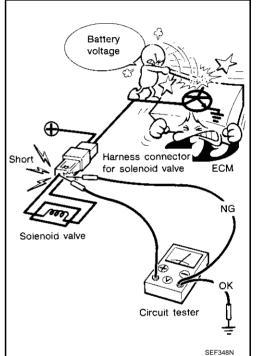




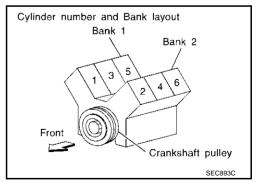
 After performing each TROUBLE DIAGNOSIS, perform DTC Confirmation Procedure or Overall Function Check. The DTC should not be displayed in the "DTC Confirmation Procedure" if the repair is completed. The "Overall Function Check" should be a good result if the repair is completed.



- 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.
- Do not 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 the bank 1, B2 indicates the bank 2 as shown in the figure.



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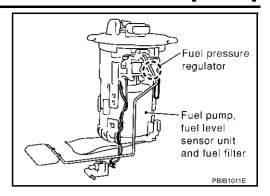
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- Do not operate fuel pump when there is no fuel in lines.
- Tighten fuel hose clamps to the specified torque.



- Do not depress accelerator pedal when starting.
- Immediately after starting, do not rev up engine unnecessarily.
- Do not rev up engine just prior to shutdown.



- 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.
 Do not let them run parallel for a long distance.
- Adjust the antenna and feeder line so that the standingwave radio can be kept smaller.
- Be sure to ground the radio to vehicle body.

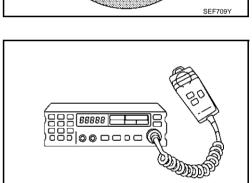
Wiring Diagrams and Trouble Diagnosis

When you read wiring diagrams, refer to the following:

- GI-14, "How to Read Wiring Diagrams"
- PG-3, "POWER SUPPLY ROUTING CIRCUIT" for power distribution circuit

When you perform trouble diagnosis, refer to the following:

- GI-10, "HOW TO FOLLOW TEST GROUPS IN TROUBLE DIAGNOSES"
- GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident"



ABS0080A

PREPARATION

[TYPE 2]

PREPARATION PFP:00002

Special Service Tools

ABS0080B

Fool number Kent-Moore No.) Fool name		Description
(V10117100 J36471-A) Heated oxygen sensor wrench	S-NT379	Loosening or tightening heated oxygen sensors with 22 mm (0.87 in) hexagon nut
(V10114400 J-38365) Heated oxygen sensor wrench	S-NT636	Loosening or tightening heated oxygen sensors a: 22 mm (0.87 in)
J-44321) Fuel pressure gauge kit	LEC642	Checking fuel pressure
(V109E0010 J-46209) Break-out box	Erraik Out Box 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Measuring the ECM signals with a circuit tester
(V109E0080 J-45819) Y-cable adapter	S-NT826	Measuring the ECM signals with a circuit tester
EG17650301 J-33984-A) Radiator cap tester adapter		Adapting radiator cap tester to radiator cap and radiator filler neck a: 28 (1.10) dia. b: 31.4 (1.236) dia. c: 41.3 (1.626) dia. Unit: mm (in)

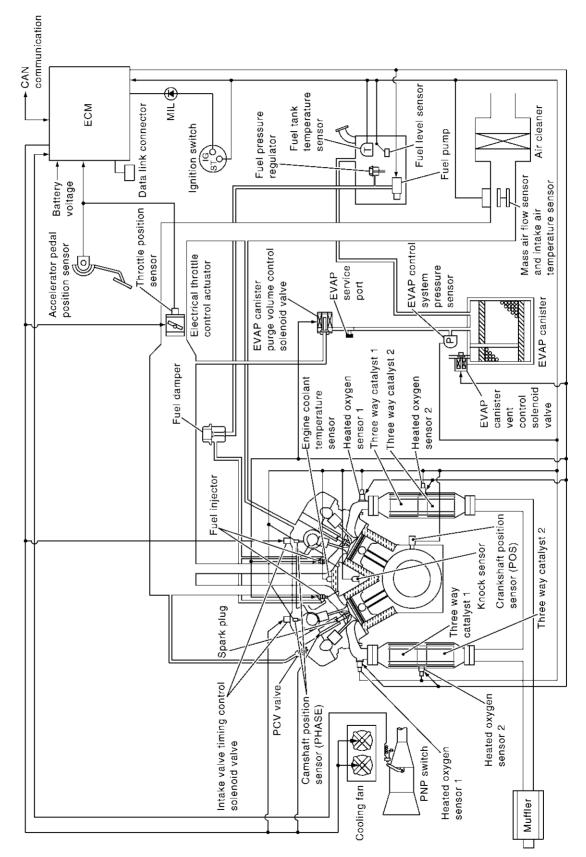
ommercial Service	ce Tools	AB\$00800
Tool name (Kent-Moore No.)		Description
Leak detector i.e.: (J41416)	S-NT703	Locating the EVAP leak
EVAP service port adapter i.e.: (J41413-OBD)	S-NT704	Applying positive pressure through EVAP service port
Fuel filler cap adapter i.e.: (MLR-8382)		Checking fuel tank vacuum relief valve opening pressure
Socket wrench	19 mm (0.75 in) Note than 32 mm (1.26 in)	Removing and installing engine coolant temperature sensor
Oxygen sensor thread cleaner i.e.: (J-43897-18) (J-43897-12)	Mating surface shave cylinder	Reconditioning the exhaust system threads before installing a new oxygen sensor. Use with anti-seize 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 specification MIL-A- 907)	S-NT779	Lubricating oxygen sensor thread cleaning tool when reconditioning exhaust system threads.

ENGINE CONTROL SYSTEM

PFP:23710

System Diagram

ABS0080D



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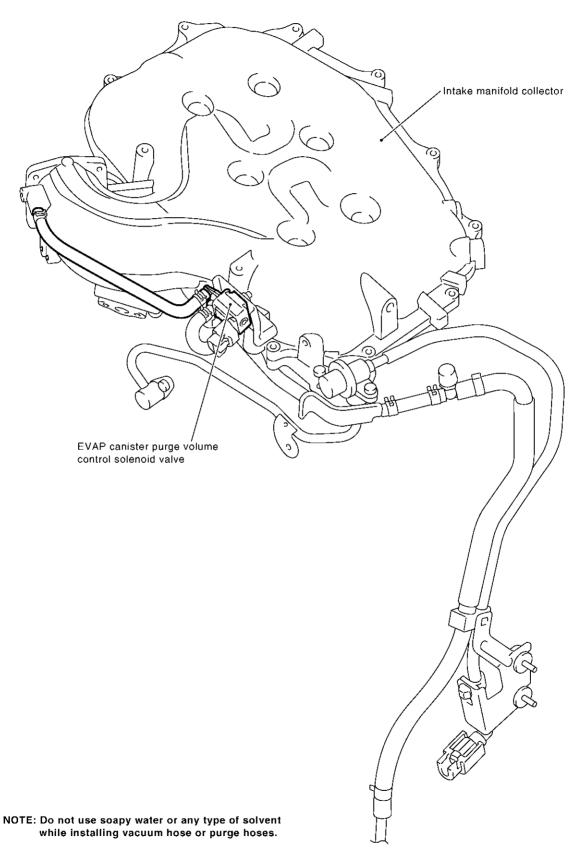
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Vacuum Hose Drawing

ABS0080E



Refer to EC-669, "System Diagram" for Vacuum Control System.

PBIB1552E

ENGINE CONTROL SYSTEM

ITYPE 21

System Chart Α Input (Sensor) **ECM Function** Output (Actuator) • Camshaft position sensor (PHASE) Fuel injection & mixture ratio control Fuel injectors Crankshaft position sensor (POS) EC Electronic ignition system Power transistor Mass air flow sensor Fuel pump control Fuel pump relay*4 • Engine coolant temperature sensor ASCD vehicle speed control Electric throttle control actuator Heated oxygen sensor 1 On board diagnostic system MIL (On the instrument panel)*4 Throttle position sensor Heated oxygen sensor 1 heater control Heated oxygen sensor 1 heater Accelerator pedal position sensor D Heated oxygen sensor 2 heater control Heated oxygen sensor 2 heater Park/neutral position (PNP) switch Intake air temperature sensor EVAP canister purge volume control EVAP canister purge flow control solenoid valve · Power steering pressure sensor F Ignition switch Air conditioning cut control Air conditioner relay*4 Battery voltage Cooling fan control Cooling fan relays*4 Knock sensor Refrigerant pressure sensor Stop lamp switch ASCD steering switch ASCD brake switch ASCD clutch switch Fuel level sensor*1 *3 Н ON BOARD DIAGNOSIS for EVAP system EVAP canister vent control valve EVAP control system pressure sensor Fuel tank temperature sensor*1 Heated oxygen sensor 2 *2 TCM (Transmission control module)*3 Air conditioner switch*3 Wheel sensor*3 Electrical load signal*3

Revision; 2004 April EC-671 2003 G35 Sedan

^{*1:} This sensor is not used to control the engine system. This is used only for the on board diagnosis.

^{*2:} This sensor is not used to control the engine system under normal conditions.

^{*3:} This input signal is sent to the ECM through CAN communication line.

^{*4:} This output signal is sent from the ECM through CAN communication line.

Multiport Fuel Injection (MFI) System INPUT/OUTPUT SIGNAL CHART

ABS0080G

Sensor	Input Signal to ECM		Actuator		
Crankshaft position sensor (POS)	Engine speed*3				
Camshaft position sensor (PHASE)	Piston position				
Mass air flow sensor	Amount of intake air				
Engine coolant temperature sensor	Engine coolant temperature				
Heated oxygen sensor 1	Density of oxygen in exhaust gas				
Throttle position sensor	Throttle position				
Accelerator pedal position sensor	Accelerator pedal position	Fuel injection			
Park/neutral position (PNP) switch	Gear position	& mixture ratio	Fuel injectors		
Knock sensor	Engine knocking condition	Control			
Battery	Battery voltage*3				
Power steering pressure sensor	Power steering operation				
Heated oxygen sensor 2 *1	Density of oxygen in exhaust gas				
Air conditioner switch*2	Air conditioner operation				
Wheel sensor*2	Vehicle speed				

^{*1:} Under normal conditions, this sensor is not for engine control operation.

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 both the crankshaft 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 (A/T models)
- High-load, high-speed operation

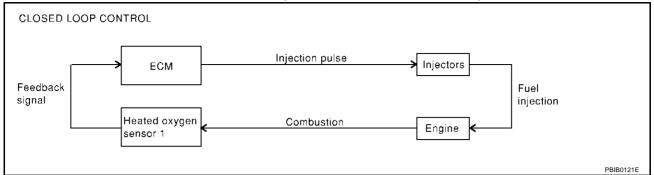
<Fuel decrease>

- During deceleration
- During high engine speed operation

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

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

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 then better reduce CO, HC and NOx emissions. This system uses heated oxygen sensor 1 in the exhaust manifold to monitor if the engine operation is rich or lean. The ECM adjusts the injection pulse width according to the sensor voltage signal. For more information about heated oxygen sensor 1, refer to EC-850. 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 heated oxygen 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 heated oxygen sensor 1 or its circuit
- Insufficient activation of heated oxygen sensor 1 at low engine coolant temperature
- High engine coolant temperature
- During warm-up
- After shifting from N to D (A/T models)
- When starting the engine

MIXTURE RATIO SELF-LEARNING CONTROL

The mixture ratio feedback control system monitors the mixture ratio signal transmitted from heated oxygen 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 film) and characteristic changes during operation (i.e., injector clogging) directly affect mixture ratio.

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 heated oxygen 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.

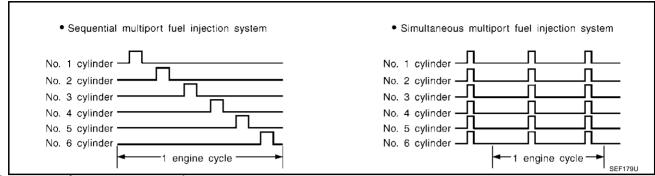
"Long term fuel trim" is overall fuel compensation carried out long-term to compensate for continual deviation of the short term fuel trim from the central value. Such deviation will occur due to individual engine differences. wear over time and changes in the usage environment.

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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 two 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 or operation of the engine at excessively high speeds.

Electronic Ignition (EI) System INPUT/OUTPUT SIGNAL CHART

ABS0080H

Sensor	Input Signal to ECM	ECM function	Actuator		
Crankshaft position sensor (POS)	Engine speed*2				
Camshaft position sensor (PHASE)	Piston position				
Mass air flow sensor	Amount of intake air				
Engine coolant temperature sensor	Engine coolant temperature		Power transistor		
Throttle position sensor	Throttle position	Ignition timing			
Accelerator pedal position sensor	Accelerator pedal position	control			
Knock sensor	Engine knocking				
Park/neutral position (PNP) switch	Gear position				
Battery	Battery voltage*2				
Wheel sensor*1	Vehicle speed				

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

SYSTEM DESCRIPTION

The ignition timing is controlled by the ECM to maintain the best airfuel ratio for every running condition of the engine. The ignition timing data is stored in the ECM. This data forms the map shown.

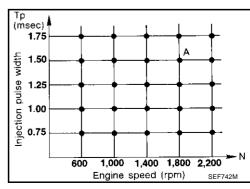
The ECM receives information such as the injection pulse width and camshaft position sensor signal. Computing this information, ignition signals are transmitted to the power transistor.

e.g., N: 1,800 rpm, Tp: 1.50 msec

A °BTDC

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



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

- 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 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.

Air Conditioning Cut Control INPUT/OUTPUT SIGNAL CHART

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Sensor	Input Signal to ECM	ECM function	Actuator		
Air conditioner switch*1	Air conditioner ON signal				
Throttle position sensor	Throttle position				
Accelerator pedal position sensor	Accelerator pedal position				
Crankshaft position sensor (POS) Camshaft position sensor (PHASE)	Engine speed*2	Air conditioner	Air conditioner relay		
Engine coolant temperature sensor	Engine coolant temperature	cut control			
Battery	Battery voltage*2				
Refrigerant pressure sensor	Refrigerant pressure				
Power steering pressure sensor	Power steering operation				
Wheel sensor*1	Vehicle speed				

^{*1:} This signal is sent to the ECM through 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.

Fuel Cut Control (at No Load and High Engine Speed) INPUT/OUTPUT SIGNAL CHART

ABS0080J

M

Sensor	Input Signal to ECM ECM fund		Actuator		
Park/neutral position (PNP) switch	Neutral position				
Throttle position sensor	Throttle position	1			
Accelerator pedal position sensor	Accelerator pedal position	Fuel cut con-			
Engine coolant temperature sensor	Engine coolant temperature	trol	Fuel injectors		
Crankshaft position sensor (POS) Camshaft position sensor (PHASE)	Engine speed				
Wheel sensor*	Vehicle speed	1			

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

SYSTEM DESCRIPTION

If the engine speed is above 1,800 rpm with no load (for example, in neutral and engine speed 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 operate until the engine speed reaches 1,500 rpm, then fuel cut is cancelled.

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

NOTE:

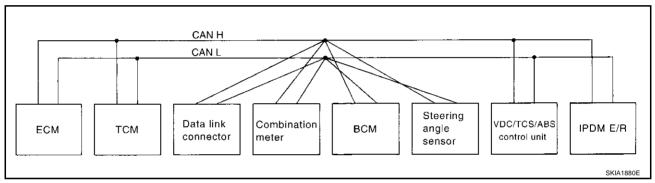
This function is different from deceleration control listed under "Multiport Fuel Injection (MFI) System", EC-672

CAN communication SYSTEM DESCRIPTION

ABS0080K

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.

CAN COMMUNICATION UNIT A/T Models SYSTEM DIAGRAM



INUPT / OUTPUT SIGNAL CHART

T: Transmit R: Receive

Signals	ECM	ТСМ	Combina- tion meter	всм	Steering angle sensor	VDC/TCS/ ABS con- trol unit	IPDM E/R
Engine torque signal	T	R					
Engine speed signal	Т	R	R			R	
Engine coolant temperature signal	Т	R	R				
Accelerator pedal position signal	Т	R				R	
Closed throttle position signal	Т	R					
Wide open throttle position signal	Т	R					
Battery voltage signal	Т	R					
Stop lamp switch signal		R	Т				
Fuel consumption monitor signal	Т		R				
A/T self-diagnosis signal	R	Т					
A/T CHECK indicator lamp signal		Т	R				
A/T position indicator signal		Т	R			R	
ABS operation signal		R				Т	
A/T shift schedule change demand signal		R				Т	
A/C switch signal	R			Т			
A/C compressor request signal	Т						R
A/C compressor feedback signal	Т		R				
Blower fan motor switch signal	R			Т			
Cooling fan motor operation signal	Т						R
Position lights request signal			R	Т			R

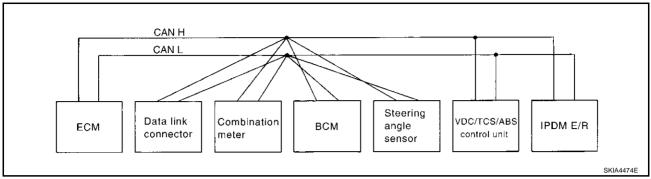
ENGINE CONTROL SYSTEM

[TYPE 2]

							[TYPE 2]	
Signals	ECM	ТСМ	Combina- tion meter	ВСМ	Steering angle sensor	VDC/TCS/ ABS con- trol unit	IPDM E/R	1
Low beam request signal				Т			R	
Low beam status signal	R						T	E
High beam request signal			R	Т			R	•
High beam status signal	R						Т	
Front fog lights request signal				Т			R	
Vehicle and district			R			Т		
Vehicle speed signal	R	R	Т	R				
Sleep request 1 signal			R	Т				•
Sleep request 2 signal				Т			R	
Wake up request 1 signal			R	Т			R	
Wake up request 2 signal			R	Т			R	
Door switch signal (without navigation system)			R	Т			R	
Door switch signal (with navigation system)			Т	R				•
Turn indicator signal			R	Т				•
Seat belt buckle switch signal			Т	R				
Oil pressure switch signal			R				Т	
Buzzer output signal			R	T				
Fuel level sensor signal	R		Т					
Malfunction indicator lamp signal	Т		R					•
ASCD SET lamp signal	Т		R					
ASCD CRUISE lamp signal	Т		R					
ASCD OD cancel request signal	Т	R						
ASCD operation signal	Т	R						
Turbine revolution signal	R	Т						
Output shaft revolution signal	R	Т						
Front wiper request signal				Т			R	
Front wiper stop position signal				R			Т	
Rear window defogger switch signal				T			R	
Rear window defogger control signal	R						Т	-
Manual mode signal		R	Т					
Not manual mode signal		R	Т					
Manual mode shift up signal		R	Т					
Manual mode shift down signal		R	Т					
Manual mode indicator signal		Т	R					
Hood switch signal				R			Т	
Theft warning horn request signal				T			R	
Horn chirp signal				T			R	
Steering angle sensor signal					Т	R		•

EC-677 Revision; 2004 April 2003 G35 Sedan

M/T Models SYSTEM DIAGRAM



INUPT / OUTPUT SIGNAL CHART

T: Transmit R: Receive

					T: Transm	it R: Receive
Signals	ECM	Combina- tion meter	ВСМ	Steering angle sen- sor	VDC/TCS/ ABS con- trol unit	IPDM E/R
Engine speed signal	Т	R			R	
Engine coolant temperature signal	Т	R				
Accelerator pedal position signal	Т				R	
Fuel consumption monitor signal	Т	R				
A/C switch signal	R		Т			
A/C compressor request signal	Т					R
A/C compressor feedback signal	Т	R				
Blower fan motor switch signal	R		Т			
Cooling fan motor operation signal	Т					R
Position lights request signal		R	Т			R
Low beam request signal			Т			R
Low beam status signal	R		R			Т
High beam request signal		R	Т			R
High beam status signal	R		R			Т
Front fog lights request signal			Т			R
		R			Т	
Vehicle speed signal	R	Т	R			
Sleep request 1 signal		R	Т			
Sleep request 2 signal			Т			R
Wake up request 1 signal		R	Т			
Wake up request 2 signal		R	Т			
Door switch signal (without navigation system)		R	Т			R
Door switch signal (with navigation system)		Т	R			
Turn indicator signal		R	Т			
Seat belt buckle switch signal		Т	R			
Oil pressure switch signal		R				T
Buzzer output signal		R	Т			
Malfunction indicator lamp signal	Т	R		1		
ASCD SET lamp signal	Т	R		1		
ASCD CRUISE lamp signal	Т	R				
Fuel level sensor signal	R	Т				

ENGINE CONTROL SYSTEM

[TYPE 2]

Signals	ECM	Combina- tion meter	ВСМ	Steering angle sen- sor	VDC/TCS/ ABS con- trol unit	IPDM E/R
Front wiper request signal			T			R
Front wiper stop position signal			R			Т
Rear window defogger switch signal			Т			R
Rear window defogger control signal	R		R			Т
Hood switch signal			R			Т
Theft warning horn request signal			T			R
Horn chirp signal			Т			R
Steering angle sensor signal				Т	R	

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BASIC SERVICE PROCEDURE

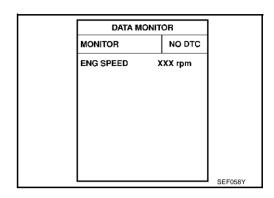
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ABSOOROL

Idle Speed and Ignition Timing Check IDLE SPEED

(P) With CONSULT-II

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



With GST

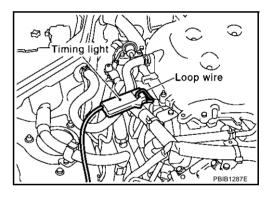
Check idle speed with GST.

IGNITION TIMING

Any of following two methods may be used.

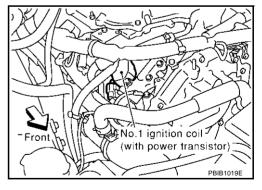
Method A

- 1. Attach timing light to loop wire as shown.
- 2. Check ignition timing.

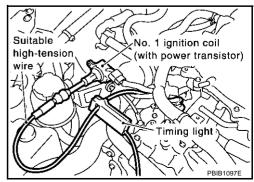


Method B

1. Remove No. 1 ignition coil.



2. Connect No. 1 ignition coil and No. 1 spark plug with suitable high-tension wire as shown, and attach timing light clamp to this wire.



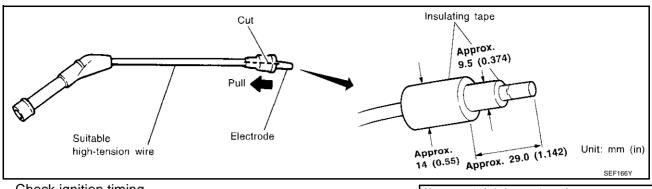
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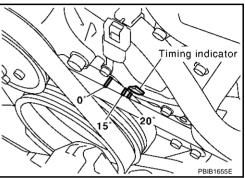
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3. Check ignition timing.

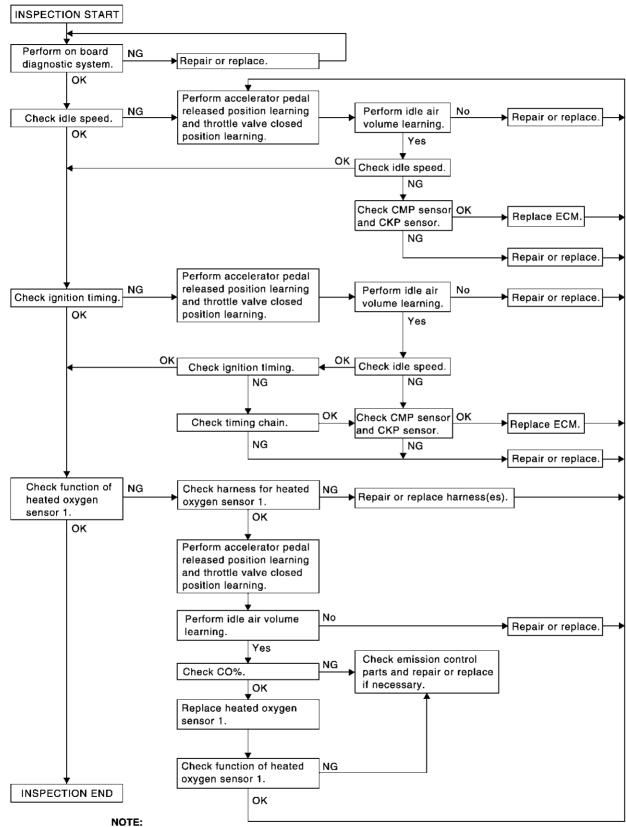


Idle Speed/Ignition Timing/Idle Mixture Ratio Adjustment PREPARATION

ABS0080M

- 1. Make sure that the following parts are in good order.
 - Battery
 - Ignition system
 - Engine oil and coolant levels
 - Fuses
 - ECM harness connector
 - Vacuum hoses
 - Air intake system (Oil filler cap, oil level gauge, etc.)
 - Fuel pressure
 - Engine compression
 - Throttle valve
 - Evaporative emission system
- 2. On air conditioner equipped models, checks should be carried out while the air conditioner is OFF.
- On automatic transmission equipped models, when checking idle rpm, ignition timing and mixture ratio, checks should be carried out while shift lever is in N position.
- 4. When measuring CO percentage, insert probe more than 40 cm (15.7 in) into tail pipe.
- 5. Turn off headlamp, heater blower, rear window defogger.
- Keep front wheels pointed straight ahead.

OVERALL INSPECTION SEQUENCE



If a vehicle contains a part which is operating outside of design specifications with no MIL illumination, the part shall not be replaced prior to emission testing unless it is determined that the part has been tampered with or abused in such a way that the diagnostic system cannot reasonably be expected to detect the resulting malfunction.

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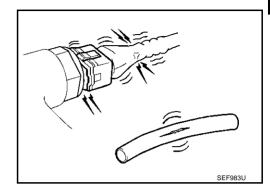
M

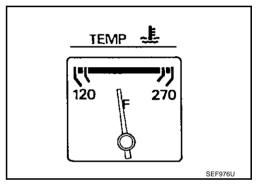
INSPECTION PROCEDURE

1. INSPECTION START

 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 leaks
- Air cleaner clogging
- Gasket
- 3. Confirm that electrical or mechanical loads are not applied.
- Head lamp switch is OFF.
- Air conditioner switch is OFF.
- Rear window defogger switch is OFF.
- Steering wheel is in the straight-ahead position, etc.
- 4. Start engine and warm it up until engine coolant temperature indicator points the middle of gauge.
 Ensure engine stays below 1,000 rpm.

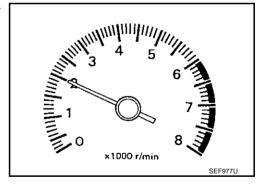




- 5. Run engine at about 2,000 rpm for about 2 minutes under no-load.
- 6. Make sure that no DTC is displayed with CONSULT-II or GST.

OK or NG

OK >> GO TO 3. NG >> GO TO 2.



2. REPAIR OR REPLACE

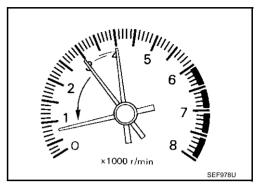
Repair or replace components as necessary according to corresponding Diagnostic Procedure.

>> GO TO 3.

$\overline{3}$. Check target idle speed

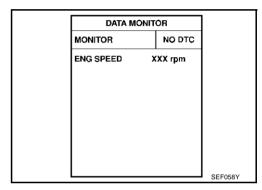
(II) With CONSULT-II

- 1. Run engine at about 2,000 rpm for about 2 minutes under no-load.
- 2. Rev engine (2,000 to 3,000 rpm) two or three times under no-load, then run engine at idle speed for about 1 minute.



3. Read idle speed in "DATA MONITOR" mode with CONSULT-II.

A/T: 650 ± 50 rpm (in P or N position) M/T: 650 ± 50 rpm (in N position)



(R) Without CONSULT-II

- 1. Run engine at about 2,000 rpm for about 2 minutes under no-load.
- 2. Rev engine (2,000 to 3,000 rpm) two or three times under no-load, then run engine at idle speed for about 1 minute.
- 3. Check idle speed.

A/T: 650 ± 50 rpm (in P or N position) M/T: 650 ± 50 rpm (in N position)

OK or NG

OK >> GO TO 10. NG >> GO TO 4.

4. PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING

- Stop engine.
- 2. Perform EC-692, "Accelerator Pedal Released Position Learning".

>> GO TO 5.

5. PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Perform EC-692, "Throttle Valve Closed Position Learning".

>> GO TO 6.

BASIC SERVICE PROCEDURE

[TYPE 2]

6. PERFORM IDLE AIR VOLUME LEARNING Perform EC-692, "Idle Air Volume Learning". Is Idle Air Volume Learning carried out successfully? EC YES or NO YES >> GO TO 7. NO >> 1. Follow the instruction of Idle Air Volume Learning. 2. GO TO 4. 7. CHECK TARGET IDLE SPEED AGAIN \Box (P) With CONSULT-II 1. Start engine and warm it up to normal operating temperature. Read idle speed in "DATA MONITOR" mode with CONSULT-II. F A/T: 650 ± 50 rpm (in P or N position) M/T: 650 ± 50 rpm (in N position) (R) Without CONSULT-II 1. Start engine and warm it up to normal operating temperature. Check idle speed. A/T: 650 ± 50 rpm (in P or N position) M/T: 650 ± 50 rpm (in N position) Н OK or NG OK >> GO TO 10. >> GO TO 8. NG 8. DETECT MALFUNCTIONING PART Check the following. Check camshaft position sensor (PHASE) and circuit. Refer to EC-955. Check crankshaft position sensor (POS) and circuit. Refer to EC-949. OK or NG OK >> GO TO 9. NG >> 1. Repair or replace. 2. GO TO 4. 9. CHECK ECM FUNCTION M

- Substitute another known-good ECM to check ECM function. (ECM may be the cause of a incident, but this is the rarely the case.)
- 2. Perform initialization of IVIS (NATS) system and registration of IVIS (NATS) ignition key IDs. Refer to <u>BL-127, "ECM Re-communicating Function"</u>.

>> GO TO 4.

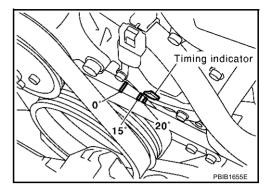
10. CHECK IGNITION TIMING

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

A/T: $15 \pm 5^{\circ}$ BTDC (in N or P position) M/T: $15 \pm 5^{\circ}$ BTDC (in N position)

OK or NG

OK (With CONSULT-II)>>GO TO 19. OK (Without CONSULT-II)>>GO TO 20. NG >> GO TO 11.



11. PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING

- 1. Stop engine.
- 2. Perform EC-692, "Accelerator Pedal Released Position Learning".

>> GO TO 12.

12. PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Perform EC-692, "Throttle Valve Closed Position Learning".

>> GO TO 13.

13. PERFORM IDLE AIR VOLUME LEARNING

Perform EC-692, "Idle Air Volume Learning".

Is Idle Air Volume Learning carried out successfully?

YES or NO

YES >> GO TO 14.

NO >> 1. Follow the instruction of Idle Air Volume Learning.

2. GO TO 4.

14. CHECK TARGET IDLE SPEED AGAIN

(P) With CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- 2. Read idle speed in "DATA MONITOR" mode with CONSULT-II.

A/T: 650 ± 50 rpm (in P or N position) M/T: 650 ± 50 rpm (in N position)

Without CONSULT-II

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

A/T: 650 ± 50 rpm (in P or N position) M/T: 650 ± 50 rpm (in N position)

OK or NG

OK >> GO TO 15. NG >> GO TO 17.

BASIC SERVICE PROCEDURE

[TYPE 2]

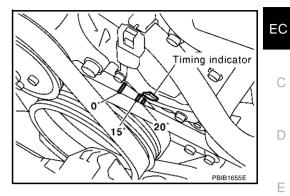
15. CHECK IGNITION TIMING AGAIN

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

 $15 \pm 5^{\circ}$ BTDC (in N or P position) A/T: M/T: $15 \pm 5^{\circ}$ BTDC (in N position)

OK or NG

OK (With CONSULT-II)>>GO TO 19. OK (Without CONSULT-II)>>GO TO 20. NG >> GO TO 16.



16. CHECK TIMING CHAIN INSTALLATION

Check timing chain installation. Refer to EM-54, "TIMING CHAIN".

OK or NG

OK >> GO TO 17.

NG >> 1. Repair the timing chain installation.

2. GO TO 4.

17. DETECT MALFUNCTIONING PART

Check the following.

- Check camshaft position sensor (PHASE) and circuit. Refer to EC-955.
- Check crankshaft position sensor (POS) and circuit. Refer to EC-949.

OK or NG

OK >> GO TO 18.

NG >> 1. Repair or replace.

2. GO TO 4.

18. CHECK ECM FUNCTION

- Substitute another known-good ECM to check ECM function. (ECM may be the cause of a incident, but this is the rarely the case.)
- 2. Perform initialization of IVIS (NATS) system and registration of IVIS (NATS) ignition key IDs. Refer to BL-127, "ECM Re-communicating Function".

>> GO TO 4.

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[TYPE 2]

19. CHECK HEATED OXYGEN SENSOR 1 (BANK 1) SIGNAL

(P) With CONSULT-II

- 1. Run engine at about 2,000 rpm for about 2 minutes under no-load.
- 2. See "HO2S1 MNTR (B1)" in "DATA MONITOR" mode.
- Running engine at 2,000 rpm under no-load (The engine is warmed up to normal operating temperature.), check that the monitor fluctuates between LEAN and RICH more than 5 times during 10 seconds.

1 time: $RICH \rightarrow LEAN \rightarrow RICH$

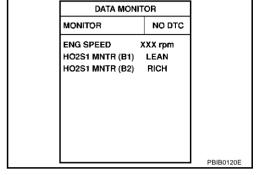
2 times: $RICH \rightarrow LEAN \rightarrow RICH \rightarrow LEAN \rightarrow RICH$

OK or NG

OK >> GO TO 21.

NG (Monitor does not fluctuate.)>>GO TO 23.

NG (Monitor fluctuates less than 5 times.)>>GO TO 31.



20. CHECK HEATED OXYGEN SENSOR 1 (BANK 1) SIGNAL

Without CONSULT-II

- 1. Stop engine and set ECM to Self-diagnostic mode II (Heated oxygen sensor 1 monitor). Refer to <u>EC-714, "HOW TO SWITCH DIAGNOSTIC TEST MODE"</u>.
- 2. Start engine and run it at about 2,000 rpm for about 2 minutes under no-load.
- 3. Running engine at 2,000 rpm under no-load (The engine is warmed up to normal operating temperature.), check that the MIL comes on more than 5 times during 10 seconds.

OK or NG

OK >> GO TO 22.

NG (MIL does not come on)>>GO TO 23.

NG (MIL comes on less than 5 times)>>GO TO 31.

21. CHECK HEATED OXYGEN SENSOR 1 (BANK 2) SIGNAL

(II) With CONSULT-II

- See "HO2S1 MNTR (B2)" in "DATA MONITOR" mode.
- Running engine at 2,000 rpm under no-load (The engine is warmed up to normal operating temperature.), check that the monitor fluctuates between LEAN and RICH more than 5 times during 10 seconds.

1 time: RICH \rightarrow LEAN \rightarrow RICH

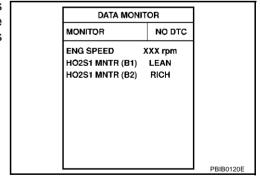
2 times: $RICH \rightarrow LEAN \rightarrow RICH \rightarrow LEAN \rightarrow RICH$

OK or NG

OK >> INSPECTION END

NG (Monitor does not fluctuate.)>>GO TO 24.

NG (Monitor fluctuates less than 5 times.)>>GO TO 31.



BASIC SERVICE PROCEDURE

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22. CHECK HEATED OXYGEN SENSOR 1 (BANK 2) SIGNAL

Without CONSULT-II

Switch the monitored sensor from bank 1 to bank 2. Refer to EC-714, "How to Switch Monitored Sensor From Bank 1 to Bank 2 or Vice Versa".

Running engine at 2,000 rpm under no-load (The engine is warmed up to normal operating temperature.), check that the MIL comes on more than 5 times during 10 seconds.

OK or NG

OK >> INSPECTION END

NG (MIL does not come on)>>GO TO 24.

NG (MIL comes on less than 5 times)>>GO TO 31.

23. CHECK HEATED OXYGEN SENSOR 1 (BANK 1) HARNESS

Turn ignition switch OFF and disconnect battery ground cable.

- Disconnect ECM harness connector.
- 3. Disconnect heated oxygen sensor 1 (bank 1) harness connector.
- Check harness continuity between ECM terminal 35 and heated oxygen sensor 1 (bank 1) terminal 1. Refer to Wiring Diagram, EC-852, "BANK 1".

Continuity should exist.

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

OK or NG

OK >> GO TO 25.

NG >> 1. Repair or replace harness between ECM and heated oxygen sensor 1 (bank 1).

2. GO TO 4.

24. CHECK HEATED OXYGEN SENSOR 1 (BANK 2) HARNESS

- Turn ignition switch OFF and disconnect battery ground cable. 1.
- 2. Disconnect ECM harness connector.
- Disconnect heated oxygen sensor 1 (bank 2) harness connector.
- Check harness continuity between ECM terminal 16 and heated oxygen sensor 1 (bank 2) terminal 1. Refer to Wiring Diagram, EC-854, "BANK 2".

Continuity should exist.

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

OK or NG

OK >> GO TO 25.

NG >> 1. Repair or replace harness between ECM and heated oxygen sensor 1 (bank 2).

2. GO TO 4.

25. PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING

- Reconnect ECM harness connector.
- 2. Perform EC-692, "Accelerator Pedal Released Position Learning".

>> GO TO 26.

26. Perform throttle valve closed position learning

Perform EC-692, "Throttle Valve Closed Position Learning".

>> GO TO 27.

EC-689 Revision; 2004 April 2003 G35 Sedan

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27. PERFORM IDLE AIR VOLUME LEARNING

Refer to EC-692, "Idle Air Volume Learning".

Is Idle Air Volume Learning carried out successfully?

YES or NO

YES (With CONSULT-II)>>GO TO 28.

YES (Without CONSULT-II)>>GO TO 29.

NO >> 1. Follow the instruction of Idle Air Volume Learning.

2. GO TO 4.

28. снеск со%

(P) With CONSULT-II

- 1. Start engine and warm it up until engine coolant temperature indicator points the middle of gauge.
- 2. Turn ignition switch OFF, wait at least 10 seconds and then turn ON.
- 3. Select "ENG COOLANT TEMP" in "ACTIVE TEST" mode.
- Set "ENG COOLANT TEMP" to 5°C (41°F) by touching "DWN" and "Qd".
- 5. Start engine and rev it (2,000 to 3,000 rpm) two or three times under no-load, then run engine at idle speed.
- 6. Check CO%.

Idle CO: 0.7 – 9.9% and engine runs smoothly.

OK or NG

OK >> GO TO 31. NG >> GO TO 30.

ENG COOLANTTEMP XXX °C MONITOR ENG SPEED XXX rpm INJ PULSE-B1 XXX msec IGN TIMING XXX BTDC

ACTIVE TEST

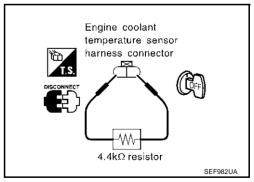
29. снеск со%

(R) Without CONSULT-II

- 1. Start engine and warm it up until engine coolant temperature indicator points to the middle of gauge.
- 2. Turn ignition switch OFF.
- 3. Disconnect engine coolant temperature sensor harness connector.
- 4. Connect a resistor (4.4 $k\Omega$) between terminals of engine coolant temperature sensor harness connector.
- 5. Start engine and rev it (2,000 to 3,000 rpm) two or three times under no-load, then run engine at idle speed.
- Check CO%.

Idle CO: 0.7 – 9.9% and engine runs smoothly.

 After checking CO%, turn ignition switch OFF, disconnect the resistor from the terminals of engine coolant temperature sensor harness connector, and then connect engine coolant temperature sensor harness connector to engine coolant temperature sensor.



OK or NG

OK >> GO TO 31. NG >> GO TO 30.

30. RECONNECT HEATED OXYGEN SENSOR 1 HARNESS CONNECTOR

- Turn ignition switch OFF.
- 2. Reconnect heated oxygen sensor 1 harness connector.

>> GO TO 34.

BASIC SERVICE PROCEDURE

[TYPE 2]

$\overline{31}$. REPLACE HEATED OXYGEN SENSOR 1

1. Stop engine.

2. Replace heated oxygen sensor 1 on the malfunctioning bank.

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With CONSULT-II>>GO TO 32. Without CONSULT-II>>GO TO 33.

32. CHECK HEATED OXYGEN SENSOR 1 (BANK 1)/(BANK 2) SIGNAL

C

(II) With CONSULT-II

- 1. Start engine and warm it up until engine coolant temperature indicator points the middle of gauge.
- 2. See "HO2S1 MNTR (B1)/(B2)" in "DATA MONITOR" mode.
- 3. Running engine at 2,000 rpm under no-load (The engine is warmed up to normal operating temperature.), check that the monitor fluctuates between LEAN and RICH more than 5 times during 10 seconds.

1 time: $RICH \rightarrow LEAN \rightarrow RICH$

2 times: $RICH \rightarrow LEAN \rightarrow RICH \rightarrow LEAN \rightarrow RICH$

F

F

OK or NG

OK >> GO TO 4. NG >> GO TO 34.

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33. CHECK HEATED OXYGEN SENSOR 1 (BANK 1)/(BANK 2) SIGNAL

Н

Without CONSULT-II

- 1. Set ECM to Self-diagnostic mode II (Heated oxygen sensor 1 monitor). Refer to <u>EC-714, "HOW TO SWITCH DIAGNOSTIC TEST MODE"</u>.
- Switch the monitored sensor to the malfunctioning bank. Refer to <u>EC-714</u>, "How to Switch Monitored Sensor From Bank 1 to Bank 2 or Vice Versa".
- Running engine at 2,000 rpm under no-load (The engine is warmed up to normal operating temperature.), check that the MIL comes on more than 5 times during 10 seconds.

OK or NG

OK >> GO TO 4. NG >> GO TO 34. Λ

34. DETECT MALFUNCTIONING PART

Check the following.

- Check fuel pressure regulator and repair or replace if necessary. Refer to <u>EC-694, "Fuel Pressure Check"</u>
- Check mass air flow sensor and its circuit, and repair or replace if necessary. Refer to $\underline{\text{EC-810}}$ and $\underline{\text{EC-818}}$.
- Check injector and its circuit, and repair or replace if necessary. Refer to <u>EC-1253</u>.
- Check engine coolant temperature sensor and its circuit, and repair or replace if necessary. Refer to <u>EC-830</u> and <u>EC-842</u>.

OK or NG

OK >> GO TO 36.

NG >> 1. Repair or replace.

2. GO TO 35.

35. erase unnecessary dtc

After this inspection, unnecessary DTC might be displayed.

Erase the stored memory in ECM and TCM. Refer to <u>EC-710</u>, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" and <u>AT-40</u>, "HOW TO ERASE DTC"

>> GO TO 4.

36. CHECK ECM FUNCTION

- 1. Substitute another known-good ECM to check ECM function. (ECM may be the cause of a incident, but this is the rarely the case.)
- 2. Perform initialization of IVIS (NATS) system and registration of IVIS (NATS) ignition key IDs. Refer to <u>BL-127</u>, "ECM Re-communicating Function".

>> GO TO 4.

Accelerator Pedal Released Position Learning DESCRIPTION

ABS0080N

Accelerator Pedal Released Position Learning is an operation 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 harness connector of accelerator pedal position sensor or ECM is disconnected.

OPERATION PROCEDURE

- 1. Make sure that accelerator pedal is fully released.
- 2. Turn ignition switch ON and wait at least 2 seconds.
- 3. Turn ignition switch OFF wait at least 10 seconds.
- 4. Turn ignition switch ON and wait at least 2 seconds.
- 5. Turn ignition switch OFF wait at least 10 seconds.

Throttle Valve Closed Position Learning DESCRIPTION

ABS00800

Throttle Valve Closed Position Learning is an operation 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.

OPERATION PROCEDURE

- Make sure that accelerator pedal is fully released.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF wait at least 10 seconds.

 Make sure that throttle valve moves during above 10 seconds by confirming the operating sound.

Idle Air Volume Learning DESCRIPTION

ABS0080P

Idle Air Volume Learning is an operation to learn the idle air volume that keeps each engine within the specific range. It must be performed under any of the following conditions:

- Each time electric throttle control actuator or ECM is replaced.
- Idle speed or ignition timing is out of specification.

PREPARATION

Before performing Idle Air Volume Learning, make sure that all of the following conditions are satisfied. Learning will be cancelled if any of the following conditions are missed for even a moment.

- Battery voltage: More than 12.9V (At idle)
- Engine coolant temperature: 70 100°C (158 212°F)
- PNP switch: ON
- Electric load switch: OFF
 (Air conditioner, headlamp, rear window defogger)

BASIC SERVICE PROCEDURE

[TYPE 2]

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On vehicles equipped with daytime light systems, set lighting switch to the 1st position to light only small lamps.

- Steering wheel: Neutral (Straight-ahead position)
- Vehicle speed: Stopped
- Transmission: Warmed-up

For models with CONSULT-II, drive vehicle until "FLUID TEMP SE" in "DATA MONITOR" mode of "A/T" system indicates less than 0.9V.

For models without CONSULT-II, drive vehicle for 10 minutes.

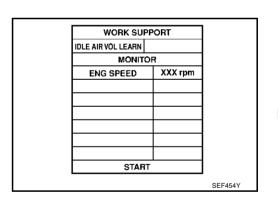
OPERATION PROCEDURE

(P) With CONSULT-II

- 1. Perform EC-692, "Accelerator Pedal Released Position Learning".
- 2. Perform EC-692, "Throttle Valve Closed Position Learning".
- 3. Start engine and warm it up to normal operating temperature.
- 4. Check that all items listed under the topic PREPARATION (previously mentioned) are in good order.
- 5. Select "IDLE AIR VOL LEARN" in "WORK SUPPORT" mode.

Γ	SELECT WORK ITEM	1
	xxxxxxxxx	
	xxxxxxxxx	
	IDLE AIR VOL LEARN	
Γ	xxxxxxxxx	
	xxxxxxxxx	
	xxxxxxxxx	
_		_
		SEF217Z

Touch "START" and wait 20 seconds.



- Make sure that "CMPLT" is displayed on CONSULT-II screen. If "CMPLT" is not displayed, Idle Air Volume Learning will not be carried out successfully. In this case, find the cause of the incident by referring to the Diagnostic Procedure below.
- 8. Rev up the engine two or three times and make sure that idle speed and ignition timing are within the specifications.

ITEM	SPECIFICATION
Idle speed	A/T: 650±50 rpm (in P or N position) M/T: 650±50 rpm (in N position)
Ignition timing	A/T: 15±5° BTDC (in P or N position) M/T: 15±5° BTDC (in N position)

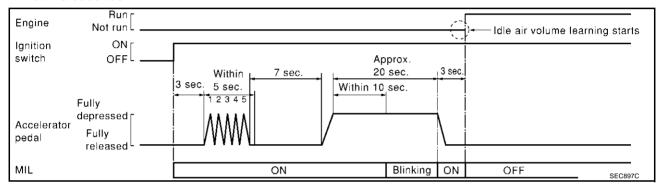
WORK SUP	PORT	
IDLE AIR VOL LEARN	CMPLT	
MONITO	OR .	
ENG SPEED	XXX rpm	1
STAR	г	
		MBIB0238E

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.

Revision; 2004 April EC-693 2003 G35 Sedan

- 1. Perform EC-692, "Accelerator Pedal Released Position Learning".
- 2. Perform EC-692, "Throttle Valve Closed Position Learning".
- 3. Start engine and warm it up to normal operating temperature.
- 4. Check that all items listed under the topic PREPARATION (previously mentioned) are in good order.
- 5. Turn ignition switch OFF and wait at least 10 seconds.
- 6. Confirm that accelerator pedal is fully released, turn ignition switch ON and wait 3 seconds.
- 7. Repeat the following procedure quickly five times within 5 seconds.
- a. Fully depress the accelerator pedal.
- b. Fully release the accelerator pedal.
- 8. Wait 7 seconds, fully depress the accelerator pedal and keep it for approx. 20 seconds until the MIL stops blinking and turned ON.
- 9. Fully release the accelerator pedal within 3 seconds after the MIL turned ON.
- 10. Start engine and let it idle.
- 11. Wait 20 seconds.



12. Rev up the engine two or three times and make sure that idle speed and ignition timing are within the specifications.

ITEM	SPECIFICATION
Idle speed	A/T: 650±50 rpm (in P or N position) M/T: 650±50 rpm (in N position)
Ignition timing	A/T: 15±5° BTDC (in P or N position) M/T: 15±5° BTDC (in N position)

13. If idle speed and ignition timing are not within the specification, Idle Air Volume Learning will not be carried out successfully. In this case, find the cause of the incident by referring to the DIAGNOSTIC PROCEDURE below.

DIAGNOSTIC PROCEDURE

If idle air volume learning cannot be performed successfully, proceed as follows:

- 1. Check that throttle valve is fully closed.
- 2. Check PCV valve operation.
- 3. Check that downstream of throttle valve is free from air leakage.
- 4. When the above three items check out OK, engine component parts and their installation condition are questionable. Check and eliminate the cause of the incident. It is useful to perform <u>EC-776</u>, "TROUBLE DIAGNOSIS - SPECIFICATION VALUE".
- 5. If any of the following conditions occur after the engine has started, eliminate the cause of the incident and perform Idle air volume learning all over again:
 - Engine stalls.
 - Erroneous idle.

Fuel Pressure Check FUEL PRESSURE RELEASE

(P) With CONSULT-II

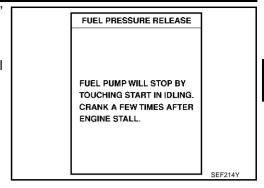
Turn ignition switch ON.

ABS0080Q

BASIC SERVICE PROCEDURE

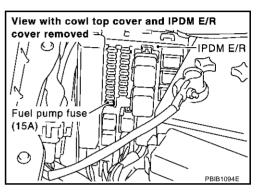
[TYPE 2]

- Perform "FUEL PRESSURE RELEASE" in "WORK SUPPORT" mode with CONSULT-II.
- 3. Start engine.
- 4. After engine stalls, crank it two or three times to release all fuel pressure.
- Turn ignition switch OFF.



⋈ Without CONSULT-II

- 1. Remove fuel pump fuse located in IPDM E/R.
- Start engine.
- 3. After engine stalls, crank it two or three times to release all fuel pressure.
- Turn ignition switch OFF.
- 5. Reinstall fuel pump fuse after servicing fuel system.



FUEL PRESSURE CHECK

Before disconnecting fuel line, release fuel pressure from fuel line to eliminate danger.

NOTE:

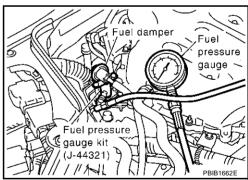
- Prepare pans or saucers under the disconnected fuel line because the fuel may spill out. The fuel
 pressure cannot be completely released because V35 models do not have fuel return system.
- Use Fuel Pressure Gauge Kit (J-44321) to check fuel pressure.
- 1. Release fuel pressure to zero. Refer to EC-694, "FUEL PRESSURE RELEASE".
- 2. Install the inline fuel quick disconnected fitting between fuel damper and injector tube.
- 3. Connect the fuel pressure test gauge (quick connector adapter hose) to the inline fuel quick disconnected 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, go to next step.
- 8. Check the following.
 - Fuel hoses and fuel tubes for clogging
 - Fuel filter for clogging
 - Fuel pump
 - Fuel pressure regulator for clogging

If OK, replace fuel pressure regulator.

If NG, repair or replace.



Revision; 2004 April EC-695 2003 G35 Sedan

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PFP:00028

Introduction ABS0080R

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	SAE Mode
Diagnostic Trouble Code (DTC)	Mode 3 of SAE J1979
Freeze Frame data	Mode 2 of SAE J1979
System Readiness Test (SRT) code	Mode 1 of SAE J1979
1st Trip Diagnostic Trouble Code (1st Trip DTC)	Mode 7 of SAE J1979
1st Trip Freeze Frame data	
Test values and Test limits	Mode 6 of SAE J1979
Calibration ID	Mode 9 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	Test value
CONSULT-II	×	×	×	×	×	_
GST	×	×*1	×	_	×	×
ECM	×	×*2	_	_	_	_

^{*1: 1}st trip DTCs for self-diagnoses concerning SRT items cannot be shown on the GST display.

The malfunction indicator lamp (MIL) on the instrument panel lights up 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-726.)

Two Trip Detection Logic

ABS0080S

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 light up 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 lights up. The MIL lights up 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 light up or blink the MIL, and store DTC and Freeze Frame data, even in the 1st trip, as shown below.

×: Applicable —: Not applicable

		М	IL		D	TC	1st trip	DTC
Items	1s	t trip	2nd	l trip	1st trip	2nd trip	1st trip	2nd trip
	Blinking	Lighting up	Blinking	Lighting up	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-655 .)	_	×	_	_	×	_	_	_
Except above	_	_	_	×	_	×	×	_

When there is an open circuit on MIL circuit, the ECM cannot warn the driver by lighting MIL up when there is malfunction on engine control system.

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 fail-safe function.

^{*2:} When DTC and 1st trip DTC simultaneously appear on the display, they cannot be clearly distinguished from each other.

[TYPE 2]

The fail-safe function also operates when above diagnoses except MIL circuit are detected and demands the driver to repair the malfunction.

Engine operating condition in fail-safe mode

Engine speed will not rise more than 2,500 rpm due to the fuel cut

Emission-related Diagnostic Information EMISSION-RELATED DIAGNOSTIC INFORMATION ITEMS

ABS0080T

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ltomo	DT	C* ¹		Test value/		Deference
Items (CONSULT-II screen terms)	CONSULT-II GST* ²	ECM*3	SRT code	Test limit (GST only)	1st trip DTC	Reference page
CAN COMM CIRCUIT	U1000	1000* ⁶	_	_	_	EC-788
CAN COMM CIRCUIT	U1001	1001* ⁶	_	_	×	EC-788
NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED.	P0000	0000	_	_	_	_
INT/V TIM CONT-B1	P0011	0011	_	_	×	EC-791
INT/V TIM CONT-B2	P0021	0021	_	_	×	EC-791
HO2S1 HTR (B1)	P0031	0031	×	×	×* ⁵	EC-794
HO2S1 HTR (B1)	P0032	0032	×	×	×* ⁵	EC-794
HO2S2 HTR (B1)	P0037	0037	×	×	×* ⁵	EC-802
HO2S2 HTR (B1)	P0038	0038	×	×	×* ⁵	EC-802
HO2S1 HTR (B2)	P0051	0051	×	×	×* ⁵	EC-794
HO2S1 HTR (B2)	P0052	0052	×	×	×* ⁵	EC-794
HO2S2 HTR (B2)	P0057	0057	×	×	×* ⁵	EC-802
HO2S2 HTR (B2)	P0058	0058	×	×	×* ⁵	EC-802
MAF SEN/CIRCUIT	P0101	0101	_	_	_	EC-810
MAF SEN/CIRCUIT	P0102	0102	_	_	_	EC-818
MAF SEN/CIRCUIT	P0103	0103	_	_	_	EC-818
IAT SEN/CIRCUIT	P0112	0112	_	_	×	EC-825
IAT SEN/CIRCUIT	P0113	0113	_	_	×	EC-825
ECT SEN/CIRCUIT	P0117	0117	_	_	_	EC-830
ECT SEN/CIRCUIT	P0118	0118	_	_		EC-830
TP SEN 2/CIRC	P0122	0122	_	_	_	EC-835
TP SEN 2/CIRC	P0123	0123	_	_	_	EC-835
ECT SENSOR	P0125	0125	_	_	_	EC-842
IAT SENSOR	P0127	0127	_	_	×	EC-845
THERMSTAT FNCTN	P0128	0128	_	_	×	EC-848
HO2S1 (B1)	P0132	0132	×	×	×* ⁵	EC-850
HO2S1 (B1)	P0133	0133	×	×	×* ⁵	EC-860
HO2S1 (B1)	P0134	0134	×	×	×* ⁵	EC-873
HO2S2 (B1)	P0138	0138	×	×	×* ⁵	EC-883
HO2S2 (B1)	P0139	0139	×	×	×* ⁵	EC-893
HO2S1 (B2)	P0152	0152	×	×	×* ⁵	EC-850
HO2S1 (B2)	P0153	0153	×	×	×* ⁵	EC-860
HO2S1 (B2)	P0154	0154	×	×	×* ⁵	EC-873

[TYPE 2]

	DTO	C* ¹		Test value/		
Items (CONSULT-II screen terms)	CONSULT-II GST* ²	ECM* ³	SRT code	Test limit (GST only)	1st trip DTC	Reference page
HO2S2 (B2)	P0158	0158	×	×	×* ⁵	EC-883
HO2S2 (B2)	P0159	0159	×	×	×* ⁵	EC-893
FUEL SYS-LEAN-B1	P0171	0171	_	_	×	EC-905
FUEL SYS-RICH-B1	P0172	0172	_	_	×	EC-914
FUEL SYS-LEAN-B2	P0174	0174	_	_	×	EC-905
FUEL SYS-RICH-B2	P0175	0175	_	_	×	EC-914
FTT SENSOR	P0181	0181	_	_	×	EC-922
FTT SEN/CIRCUIT	P0182	0182	_	_	×	EC-927
FTT SEN/CIRCUIT	P0183	0183	_	_	×	EC-927
TP SEN 1/CIRC	P0222	0222	_	_	_	EC-931
TP SEN 1/CIRC	P0223	0223	_	_	_	EC-931
MULTI CYL MISFIRE	P0300	0300	_	_	×	EC-938
CYL 1 MISFIRE	P0301	0301	_	_	×	EC-938
CYL 2 MISFIRE	P0302	0302	_	_	×	EC-938
CYL 3 MISFIRE	P0303	0303	_	_	×	EC-938
CYL 4 MISFIRE	P0304	0304	_	_	×	EC-938
CYL 5 MISFIRE	P0305	0305	_	_	×	EC-938
CYL 6 MISFIRE	P0306	0306	_	_	×	EC-938
KNOCK SEN/CIRC-B1	P0327	0327	_	_	×	EC-944
KNOCK SEN/CIRC-B1	P0328	0328	_	_	×	EC-944
CKP SEN/CIRCUIT	P0335	0335		_	×	EC-949
CMP SEN/CIRC-B1	P0340	0340	_	_	×	EC-955
CMP SEN/CIRC-B2	P0345	0345	_	_	×	EC-955
TW CATALYST SYS-B1	P0420	0420	×	×	×* ⁵	EC-964
TW CATALYST SYS-B2	P0430	0430	×	×	×* ⁵	EC-964
EVAP PURG FLOW/MON	P0441	0441	×	×	×* ⁵	EC-969
EVAP SMALL LEAK	P0442	0442	×	×	×* ⁵	EC-974
PURG VOLUME CONT/V	P0444	0444	_	_	×	EC-984
PURG VOLUME CONT/V	P0445	0445	_	_	×	EC-984
VENT CONTROL VALVE	P0447	0447	_	_	×	EC-991
EVAP SYS PRES SEN	P0451	0451	_	_	×	EC-998
EVAP SYS PRES SEN	P0452	0452	_	_	×	EC-1001
EVAP SYS PRES SEN	P0453	0453	_	_	×	EC-1007
EVAP GROSS LEAK	P0455	0455	_	×	×* ⁵	EC-1015
EVAP VERY SML LEAK	P0456	0456	×*4	×	×* ⁵	EC-1023
FUEL LEV SEN SLOSH	P0460	0460	_	_	×	EC-1033
FUEL LEVEL SENSOR	P0461	0461	_	_	×	EC-1035
FUEL LEVL SEN/CIRC	P0462	0462	_	_	×	EC-1037
VEH SPEED SEN/CIRC*7	P0500	0500	_	_	×	EC-1039
ISC SYSTEM	P0506	0506	_	_	×	EC-1041
ISC SYSTEM	P0507	0507	_	_	×	EC-1043

[TYPE 2]

						[ITPE 2]	-
	DT	C* ¹		Test value/			
Items (CONSULT-II screen terms)	CONSULT-II GST* ²	ECM*3	SRT code	Test limit (GST only)	1st trip DTC	Reference page	Α
PW ST P SEN/CIRC	P0550	0550	_	_	×	EC-1045	EC
ECM	P0605	0605	_	_	× or —	EC-1050	
PNP SW/CIRC	P0705	0705	_	_	×	<u>AT-110</u>	
ATF TEMP SEN/CIRC	P0710	0710	_	_	×	<u>AT-155</u>	С
VEH SPD SEN/CIR AT* ⁷	P0720	0720	_	_	×	<u>AT-115</u>	
ENGINE SPEED SIG	P0725	0725	_	_	×	<u>AT-120</u>	D
TCC SOLENOID/CIRC	P0740	0740	_	_	×	<u>AT-122</u>	
A/T TCC S/V FNCTN	P0744	0744	_	_	×	<u>AT-127</u>	
L/PRESS SOL/CIRC	P0745	0745	_	_	×	<u>AT-132</u>	Е
ECM BACK UP/CIRC	P1065	1065	_	_	×	EC-1053	
INT/V TIM V/CIR-B1	P1111	1111	_	_	×	EC-1057	F
ETC ACTR	P1121	1121	_	_	_	EC-1064	
ETC FUNCTION/CIRC	P1122	1122	_	_	_	EC-1066	
ETC MOT PWR	P1124	1124	_	_	_	EC-1072	G
ETC MOT PWR	P1126	1126	_	_	_	EC-1072	
ETC MOT	P1128	1128	_	_	_	EC-1077	Н
INT/V TIM V/CIR-B2	P1136	1136	_	_	×	EC-1057	
HO2S1 (B1)	P1143	1143	×	×	×* ⁵	EC-1082	
HO2S1 (B1)	P1144	1144	×	×	×* ⁵	EC-1088	
HO2S2 (B1)	P1146	1146	×	×	×* ⁵	EC-1095	
HO2S2 (B1)	P1147	1147	×	×	×* ⁵	EC-1107	J
CLOSED LOOP-B1	P1148	1148	_	_	_	EC-1119	
HO2S1 (B2)	P1163	1163	×	×	×* ⁵	EC-1082	L
HO2S1 (B2)	P1164	1164	×	×	×* ⁵	EC-1088	K
HO2S2 (B2)	P1166	1166	×	×	×* ⁵	EC-1095	
HO2S2 (B2)	P1167	1167	×	×	×* ⁵	EC-1107	L
CLOSED LOOP-B2	P1168	1168	_	_	_	EC-1119	
TCS C/U FUNCTN	P1211	1211	_	_	×	EC-1121	N
TCS/CIRC	P1212	1212	_	_	×	EC-1122	
ENG OVER TEMP	P1217	1217	_	_	_	EC-1123(A/T) EC-1135(M/T)	
CTP LEARNING	P1225	1225	_	_	×	EC-1147	
CTP LEARNING	P1226	1226	_	_	×	EC-1149	
SENSOR POWER/CIRC	P1229	1229	_	_	_	EC-1151	
PURG VOLUME CONT/V	P1444	1444	_	_	×	EC-1156	
VENT CONTROL VALVE	P1446	1446	_	_	×	EC-1164	
ASCD SW	P1564	1564	_	_	_	EC-1171	
ASCD BRAKE SW	P1572	1572	_	_	_	EC-1178	
ASCD VHL SPD SEN	P1574	1574	_	_	_	EC-1195	
NATS MALFUNCTION	P1610 - P1615	1610 - 1615	_	_	×	EC-712	
TPV SEN/CIRC A/T	P1705	1705	_	_	_	<u>AT-152</u>	

Revision; 2004 April **EC-699** 2003 G35 Sedan

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Items	DT CONSULT-II	C* ¹	SRT code	Test value/ Test limit	1st trip DTC	Reference
(CONSULT-II screen terms)	GST*2	ECM*3		(GST only)		page
P-N POS SW/CIRCUIT	P1706	1706	_	_	×	EC-1197
TURBINE REV S/CIRC	P1716	1716	_	_	×	<u>AT-161</u>
A/T INTERLOCK	P1730	1730	_		_	<u>AT-168</u>
I/C SOLENOID/CIRC	P1752	1752	_		_	<u>AT-179</u>
I/C SOLENOID FNCTN	P1754	1754	_	_	_	<u>AT-184</u>
FR/B SOLENOID/CIRC	P1757	1757	_	_	_	<u>AT-188</u>
FR/B SOLENOID/CIRC	P1759	1759	_	_	_	<u>AT-193</u>
D/C SOLENOID/CIRC	P1762	1762	_	_	_	<u>AT-198</u>
D/C SOLENOID FNCTN	P1764	1764	_	_	_	AT-203
HLR/C SOL/CIRC	P1767	1767	_	_	_	AT-207
HLR/C SOL FNCTN	P1769	1769	_	_	_	<u>AT-212</u>
LC/B SOLENOID/CIRC	P1772	1772	_	_	_	AT-217
LC/B SOLENOID FNCT	P1774	1774	_	_	_	AT-222
BRAKE SW/CIRCUIT	P1805	1805	_	_	×	EC-1206
APP SEN 1/CIRC	P2122	2122	_	_	_	EC-1211
APP SEN 1/CIRC	P2123	2123	_	_	_	EC-1211
APP SEN 2/CIRC	P2127	2127	_	_	_	EC-1218
APP SEN 2/CIRC	P2128	2128	_	_	_	EC-1218
TP SENSOR	P2135	2135	_	_	_	EC-1225
APP SENSOR	P2138	2138	_	_	_	EC-1232

^{*1: 1}st trip DTC No. is the same as DTC No.

DTC AND 1ST TRIP DTC

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 reoccur, the 1st trip DTC will not be displayed.

If a malfunction is detected during the 1st trip, the 1st trip DTC is stored in the ECM memory. The MIL will not light up (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 lights up. 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 stored 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 light up 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 <u>EC-710</u>, "HOW <u>TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION"</u>.

For malfunctions in which 1st trip DTCs are displayed, refer to EC-697, "EMISSION-RELATED DIAGNOSTIC INFORMATION ITEMS". 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-II.

1st trip DTC is specified in Mode 7 of SAE J1979. 1st trip DTC detection occurs without lighting up 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 II, refer to EC-722, "WORK FLOW" . Then perform DTC Con-

^{*2:} This number is prescribed by SAE J2012.

^{*3:} In Diagnostic Test Mode II (Self-diagnostic results), this number is controlled by NISSAN.

^{*4:} SRT code will not be set if the self-diagnostic result is NG.

^{*5:} This is not displayed with GST.

^{*6:} The troubleshooting for this DTC needs CONSULT-II.

^{*7:} When the fail-safe operations for both self-diagnoses occur at the same time, the MIL illuminates.

[TYPE 2]

firmation Procedure or Overall Function Check to try to duplicate the malfunction. If the malfunction is duplicated, the item requires repair.

How to Read DTC and 1st Trip DTC

DTC and 1st trip DTC can be read by the following methods.

(P) With CONSULT-II

With GST

CONSULT-II or GST (Generic Scan Tool) Examples: P0340, P1148, P1706, etc.

These DTCs are prescribed by SAE J2012.

(CONSULT-II 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, 1148, 1706, 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 or 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-II can identify malfunction status as shown below. Therefore, using CONSULT-II (if available) is recommended.

A sample of CONSULT-II display for DTC and 1st trip DTC is shown below. DTC or 1st trip DTC of a malfunction is displayed in SELF-DIAGNOSTIC RESULTS mode of CONSULT-II. 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].

	SELF DIAG RESU	SELF DIAG RESULTS			ILTS
	DTC RESULTS	TIME	DTC RESULTS		TIME
DTC	CKP SEN/CIRCUIT [P0335]	0	CKP SEN/CIRCUIT [P0335]	1st trip	1t
display			цу	DTC display	
L					

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, 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-II or GST. The 1st trip freeze frame data can only be displayed on the CONSULT-II screen, not on the GST. For details, see EC-759, "Freeze Frame Data and 1st Trip Freeze Frame Data".

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 stored 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 mal-

EC-701 2003 G35 Sedan Revision; 2004 April

EC

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[TYPE 2]

function 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 EC-710, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION".

SYSTEM READINESS TEST (SRT) CODE

System Readiness Test (SRT) code is specified in Mode 1 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.

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.

[TYPE 2]

SRT Item

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

SRT item (CONSULT-II indica- tion)	Perfor- mance Pri- ority*1	Required self-diagnostic items to set the SRT to "CMPLT"	Corresponding DTC No.
CATALYST	2	Three way catalyst function	P0420, P0430
EVAP SYSTEM	1	EVAP control system	P0442
	2	EVAP control system	P0456
	2	EVAP control system purge flow monitoring	P0441
HO2S	2	Heated oxygen sensor 1	P0132, P0152
		Heated oxygen sensor 1	P0133, P0153
		Heated oxygen sensor 1	P0134, P0154
		Heated oxygen sensor 1	P1143, P1163
		Heated oxygen sensor 1	P1144, P1164
		Heated oxygen sensor 2	P0138, P0158
		Heated oxygen sensor 2	P0139, P0159
		Heated oxygen sensor 2	P1146, P1166
		Heated oxygen sensor 2	P1147, P1167
HO2S HTR	2	Heated oxygen sensor 1 heater	P0031, P0032, P0051, P0052
		Heated oxygen sensor 2 heater	P0037, P0038, P0057, P0058

^{*1:} If completion of several SRTs is required, perform driving patterns (DTC confirmation procedure), one by one based on the priority for models with CONSULT-II.

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.

Self-diagnosis result		Example				
		Diagnosis	\leftarrow ON \rightarrow O		on cycle $OFF \leftarrow ON \rightarrow 0$	$OFF \leftarrow ON \rightarrow$
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.

Revision; 2004 April EC-703 2003 G35 Sedan

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[TYPE 2]

-: Self-diagnosis is not carried out.

When all SRT related self-diagnoses showed 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 showed 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 showed 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 one (1) for each self-diagnosis (Case 1 & 2) or 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.
- When, during SRT driving pattern, 1st trip DTC (NG) is detected prior to "CMPLT" of SRT, the self-diagnosis memory must be erased from ECM after repair.
- If the 1st trip DTC is erased, all the SRT will indicate "INCMP".

NOTE:

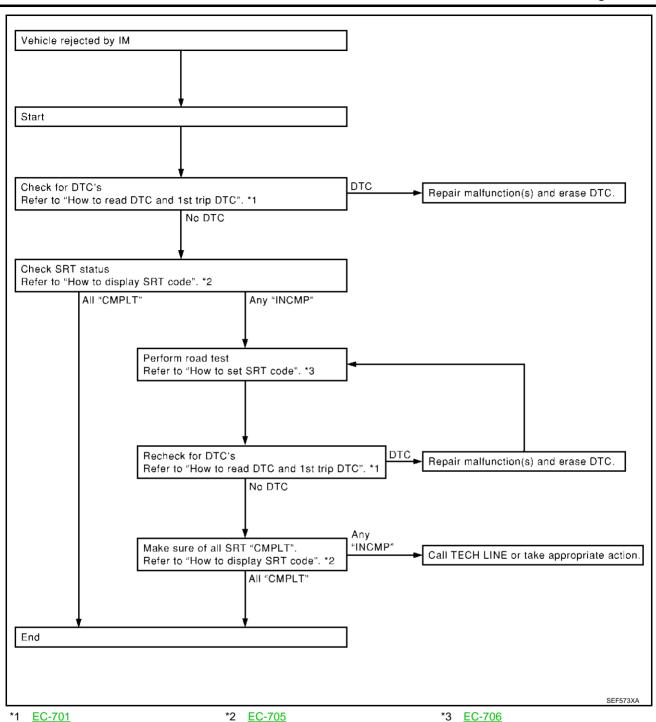
SRT can be set as "CMPLT" together with the DTC(s). Therefore, DTC check must always be carried out prior to the state emission inspection even though the SRT indicates "CMPLT".

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 page.

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How to Display SRT Code

(P) WITH CONSULT-II

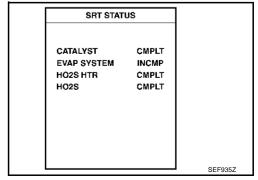
Selecting "SRT STATUS" in "DTC CONFIRMATION" mode with CONSULT-II.

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

A sample of CONSULT-II display for SRT code is shown at right. "INCMP" means the self-diagnosis is incomplete and SRT is not set. "CMPLT" means the self-diagnosis is complete and SRT is set.

WITH GST

Selecting Mode 1 with GST (Generic Scan Tool)



[TYPE 2]

How to Set SRT Code

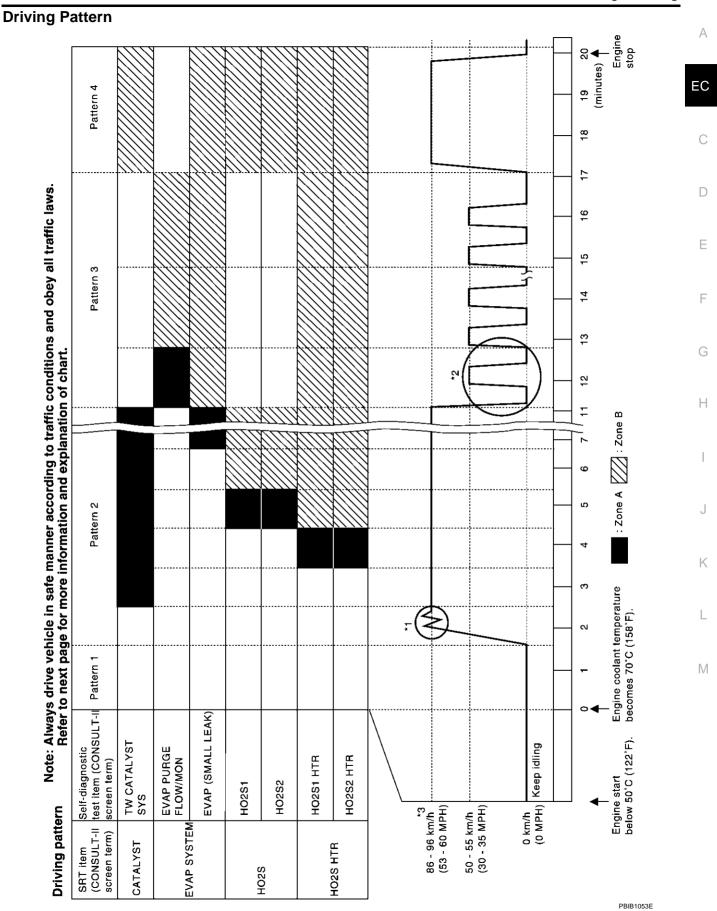
To set all SRT codes, self-diagnosis for the items indicated above must be performed one or more times. Each diagnosis may require a long period of actual driving under various conditions.

(1) WITH CONSULT-II

Perform corresponding DTC Confirmation Procedure one by one based on Performance Priority in the table on <u>EC-703</u>, "SRT Item".

WITHOUT CONSULT-II

The most efficient driving pattern in which SRT codes can be properly set is explained on the next page. The driving pattern should be performed one or more times to set all SRT codes.



- 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 terminal 73 and ground is 3.0 - 4.3V).
- 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 73 and ground is lower than 1.4V).
- The engine is started at the fuel tank temperature of warmer than 0°C (32°F) (where the voltage between the ECM terminal 107 and ground is less than 4.1V).

Pattern 2:

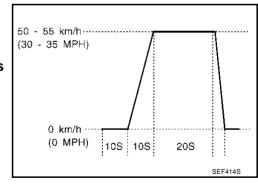
When steady-state driving is performed again even after it is interrupted, each diagnosis can be conducted. In this case, the time required for diagnosis may be extended.

Pattern 3:

The driving pattern outlined in *2 must be repeated at least 3 times.

Pattern 4:

- Tests are performed after the engine has been operated for at least 17 minutes.
- The accelerator pedal must be held very steady during steady-state driving.
- If the accelerator pedal is moved, the test must be conducted all over 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: Operate the vehicle in the following driving pattern.
- 1. Decelerate vehicle to 0 km/h (0 MPH) and let engine idle.
- 2. Repeat driving pattern shown at right at least 10 times.
- During acceleration, hold the accelerator pedal as steady as possible.
- *3: Checking the vehicle speed with GST is advised.



Suggested Transmission Gear Position

Set the selector lever in the D position.

Suggested Upshift Speeds for M/T Models

Shown below are suggested vehicle speeds for shifting into a higher gear. These suggestions relate to fuel economy and vehicle performance. Actual upshift speeds will vary according to road conditions, the weather and individual driving habits.

[TYPE 2]

	For normal accelerati [less than 1,2	For quick acceleration in low altitude areas and high altitude areas [over 1,219 m (4,000 ft)]:	
Gear change	ACCEL shift point km/h (MPH)	CRUISE shift point km/h (MPH)	km/h (MPH)
1st to 2nd	21 (13)	13 (8)	24 (15)
2nd to 3rd	37 (23)	26 (16)	40 (25)
3rd to 4th	48 (30)	40 (25)	64 (40)
4th to 5th	60 (37)	45 (28)	72 (45)
6th	68 (42)	53 (33)	80 (50)

Suggested Maximum Speed in Each Gear

Downshift to a lower gear if the engine is not running smoothly, or if you need to accelerate.

Do not exceed the maximum suggested speed (shown below) in any gear. For level road driving, use the highest gear suggested for that speed. Always observe posted speed limits and drive according to the road conditions to ensure sage operation. Do not over-rev the engine when shifting to a lower gear as it may cause engine damage or loss of vehicle control.

Gear	km/h (MPH)
1st	56 (35)
2nd	96 (60)
3rd	136 (85)
4th	_
5th	_
6th	_

TEST VALUE AND TEST LIMIT (GST ONLY — NOT APPLICABLE TO CONSULT-II)

The following is the information specified in Mode 6 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.

Items for which these data (test value and test limit) are displayed are the same as SRT code items (30 test items).

These data (test value and test limit) are specified by Test ID (TID) and Component ID (CID) and can be displayed on the GST screen.

×: Applicable —: Not applicable

			/	. Applicable —	INOL applicat
SRT item	Solf diagnostic test item	Test value (GST display)		Test limit	Application
SKT Item	Self-diagnostic test item	TID	CID	1631 111111	Application
CATALYST	Three way establish function (Pank 1)	01H	01H	Max.	×
	Three way catalyst function (Bank 1)	02H	81H	Min.	×
	Three way catalyst function (Bank 2)	03H	02H	Max.	×
		04H	82H	Min.	×
	EVAP control system (Small leak)	05H	03H	Max.	×
EVAP SYSTEM	EVAP control system purge flow monitoring	06H	83H	Min.	×
	EVAP control system (Very small leak)	07H	03H	Max.	×

Revision; 2004 April EC-709 2003 G35 Sedan

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		Test value (GST display)			
SRT item	Self-diagnostic test item	TID	CID	Test limit	Application
		09H	04H	Max.	×
		0AH	84H	Min.	×
	Heated oxygen sensor 1 (Bank 1)	0BH	04H	Max.	×
		0CH	04H	Max.	×
		0DH	04H	Max.	×
		11H	05H	Max.	×
		12H	85H	Min.	×
	Heated oxygen sensor 1 (Bank 2)	13H	05H	Max.	×
HO2S		14H	05H	Max.	×
HU25		15H	05H	Max.	×
	Heated oxygen sensor 2 (Bank 1)	19H	86H	Min.	×
		1AH	86H	Min.	×
		1BH	06H	Max.	×
		1CH	06H	Max.	×
	Heated oxygen sensor 2 (Bank 2)	21H	87H	Min.	×
		22H	87H	Min.	×
		23H	07H	Max.	×
		24H	07H	Max.	×
	Heated oxygen sensor 1 heater (Bank 1)	29H	08H	Max.	×
	neated oxygen sensor i neater (bank i)	2AH	88H	Min.	×
	Hooted everyon conser 1 heater (Penk 2)	2BH	09H	Max.	×
HO2S HTR	Heated oxygen sensor 1 heater (Bank 2)	2CH	89H	Min.	×
пого птк	Hooted awagen conser 2 hooter /Perls 4)	2DH	0AH	Max.	×
	Heated oxygen sensor 2 heater (Bank 1)	2EH	8AH	Min.	×
	Hooted awagen conser 2 hooter (Pank 2)	2FH	0BH	Max.	×
	Heated oxygen sensor 2 heater (Bank 2)	30H	8BH	Min.	×

HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION How to Erase DTC

(P) WITH CONSULT-II

The emission related diagnostic information in the ECM can be erased by selecting "ERASE" in the "SELF-DIAG RESULTS" mode with CONSULT-II.

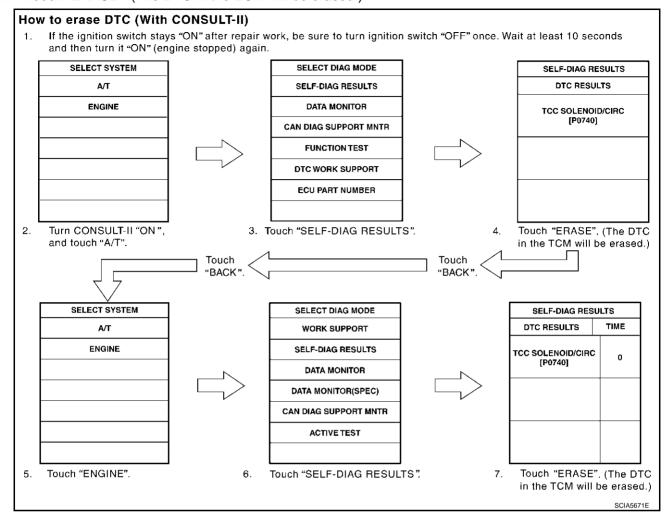
If DTCs are displayed for both ECM and TCM (Transmission control module), they need to be erased individually from the ECM and TCM (Transmission control module).

NOTE:

If the DTC is not for A/T related items (see EC-655), skip steps 2 through 4.

- 1. 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.
- 2. Turn CONSULT-II ON and touch "A/T".
- 3. Touch "SELF-DIAG RESULTS".
- 4. Touch "ERASE". [The DTC in the TCM (Transmission control module) will be erased.] Then touch "BACK" twice.
- 5. Touch "ENGINE".
- 6. Touch "SELF-DIAG RESULTS".

Touch "ERASE". (The DTC in the ECM will be erased.)



WITH GST

The emission related diagnostic information in the ECM can be erased by selecting Mode 4 with GST.

If the DTC is not for A/T related items (see EC-16), skip step 2.

- 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.
- Perform AT-99, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)". (The engine warm-up step can be skipped when performing the diagnosis only to erase the DTC.)
- Select Mode 4 with GST (Generic Scan Tool).

NO TOOLS

- 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.
- Change the diagnostic test mode from Mode II to Mode I by depressing the accelerator pedal. Refer to EC-714, "HOW TO SWITCH DIAGNOSTIC TEST MODE".
- If the battery is disconnected, the emission-related diagnostic information will be lost 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

EC-711 Revision; 2004 April 2003 G35 Sedan

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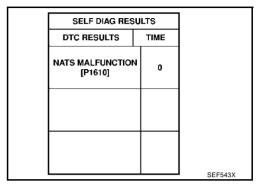
- Test values
- Others

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.

IVIS (Infiniti Vehicle Immobilizer System — NATS)

ABS0080U

- If the security indicator lights up with the ignition switch in the ON position or "NATS MALFUNCTION" is displayed on "SELF-DIAG RESULTS" screen, perform self-diagnostic results mode with CONSULT-II using NATS program card. Refer to <u>BL-125</u>, "IVIS (INFINITI VEHICLE IMMOBILIZER SYSTEM-NATS)".
- Confirm no self-diagnostic results of IVIS (NATS) is displayed before touching "ERASE" in "SELF-DIAG RESULTS" mode with CONSULT-II.
- When replacing ECM, initialization of IVIS (NATS) system and registration of all IVIS (NATS) ignition key IDs must be carried out with CONSULT-II using NATS program card.



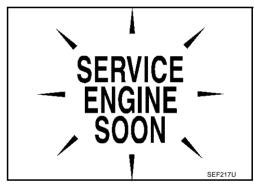
Therefore, be sure to receive all keys from vehicle owner. Regarding the procedures of IVIS (NATS) initialization and IVIS (NATS) ignition key ID registration, refer to CONSULT-II operation manual, IVIS/NVIS.

Malfunction Indicator Lamp (MIL) DESCRIPTION

ABS0080V

The MIL is located on the instrument panel.

- The MIL will light up when the ignition switch is turned ON without the engine running. This is a bulb check.
 If the MIL does not light up, refer to DI-30, "WARNING LAMPS", or see EC-1290.
- When the engine is started, the MIL should go off.
 If the MIL remains on, the on board diagnostic system has
 detected an engine system malfunction.



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ON BOARD DIAGNOSTIC SYSTEM FUNCTION

The on board diagnostic system has the following four functions.

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	This is a usual driving condition. When a malfunction is detected twice in two consecutive driving cycles (two trip detection logic), the MIL will light up to inform the driver that a malfunction has been detected. The following malfunctions will light up 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.
	Engine running	HEATED OXYGEN SENSOR 1 MONITOR	This function allows the fuel mixture condition (lean or rich), monitored by heated oxygen sensor 1, to be read.

When there is an open circuit on MIL circuit, the ECM cannot warn the driver by lighting MIL up when there is malfunction on engine control system.

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 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.

Engine operating condition in rail sale mode	Engine operating condition in fail-safe mode	Engine speed will not rise more than 2,500 rpm due to the fuel cut
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MIL Flashing Without DTC

If the ECM is in Diagnostic Test Mode II, MIL may flash when engine is running. In this case, check ECM diagnostic test mode. <u>EC-714</u>, "<u>HOW TO SWITCH DIAGNOSTIC TEST MODE</u>".

How to switch the diagnostic test (function) modes, and details of the above functions are described later. $\underline{\sf EC-714}$, "HOW TO SWITCH DIAGNOSTIC TEST MODE".

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
- 1st trip freeze frame data
- System readiness test (SRT) codes
- Test values
- Others

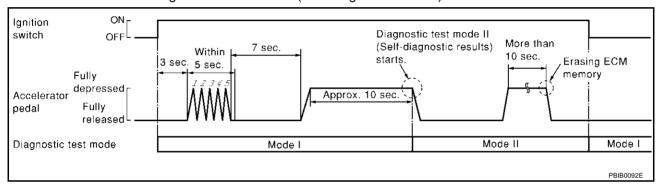
HOW TO SWITCH DIAGNOSTIC TEST MODE

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.
- Always ECM returns to Diagnostic Test Mode I after 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.
- 2. Repeat the following procedure quickly five times within 5 seconds.
- a. Fully depress the accelerator pedal.
- Fully release the accelerator pedal.
- 3. Wait 7 seconds, fully depress the accelerator pedal and keep it for approx. 10 seconds until the MIL starts blinking.
- 4. Fully release the accelerator pedal. ECM has entered to Diagnostic Test Mode II (Self-diagnostic results).



How to Set Diagnostic Test Mode II (Heated Oxygen Sensor 1 Monitor)

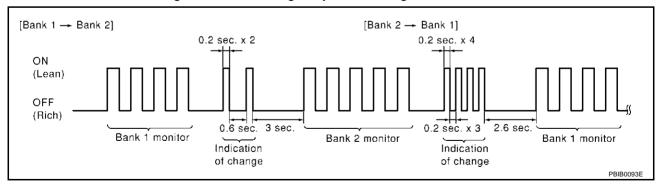
- Set the ECM in Diagnostic Test Mode II (Self-diagnostic results). Refer to <u>EC-714</u>, "How to <u>Set Diagnostic Test Mode II (Self-diagnostic Results)"</u>.
- 2. Start Engine.

ECM has entered to Diagnostic Test Mode II (Heated oxygen sensor 1 monitor).

ECM will start heated oxygen sensor 1 monitoring from the bank 1 sensor.

How to Switch Monitored Sensor From Bank 1 to Bank 2 or Vice Versa

- Fully depress the accelerator pedal quickly and then release it immediately.
- Make sure that monitoring sensor has changed by MIL blinking as follows.



How to Erase Diagnostic Test Mode II (Self-diagnostic Results)

- Set ECM in Diagnostic Test Mode II (Self-diagnostic results). Refer to <u>EC-714</u>, "How to <u>Set Diagnostic Test Mode II (Self-diagnostic Results)"</u>.
- Fully depress the accelerator pedal and keep it 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.

[TYPE 2]

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DIAGNOSTIC TEST MODE I — BULB CHECK

In this mode, the MIL on the instrument panel should stay ON. If it remains OFF, check the bulb. Refer to $\underline{\text{DI-}}$ 30, "WARNING LAMPS" or see $\underline{\text{EC-1290}}$.

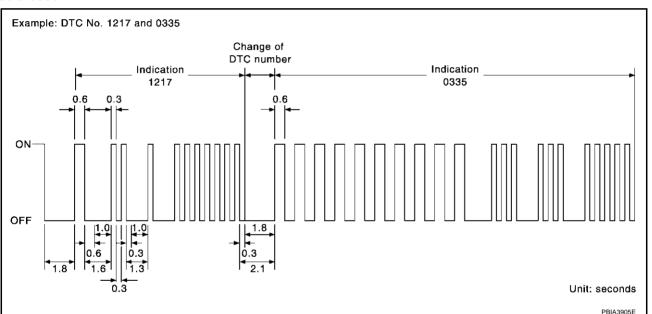
DIAGNOSTIC TEST MODE I — MALFUNCTION WARNING

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 unidentified codes can be identified by using the CONSULT-II 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 flashes. The "zero" is indicated by the number of ten flashes. The length of time the 1,000th-digit numeral flashes 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-second ON and 0.3-second 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-second OFF.

In this way, all the detected malfunctions are classified by their DTC numbers. The DTC 0000 refers to no malfunction. (See $\underline{\text{EC-655}}$, "INDEX FOR DTC")

How to Erase Diagnostic Test Mode II (Self-diagnostic Results)

The DTC can be erased from the back up memory in the ECM by depressing accelerator pedal. Refer to EC-714, "How to Erase Diagnostic Test Mode II (Self-diagnostic Results)".

- If the battery is disconnected, the DTC will be lost from the backup memory within 24 hours.
- Be careful not to erase the stored memory before starting trouble diagnoses.

DIAGNOSTIC TEST MODE II — HEATED OXYGEN SENSOR 1 MONITOR

In this mode, the MIL displays the condition of the fuel mixture (lean or rich) which is monitored by the heated oxygen sensor 1.

[TYPE 2]

MIL	Fuel mixture condition in the exhaust gas	Air fuel ratio feedback control condition	
ON	Lean		
OFF	Rich	Closed loop system	
*Remains ON or OFF	Any condition	Open loop system	

^{*:} Maintains conditions just before switching to open loop.

To check the heated oxygen sensor 1 function, start engine in the Diagnostic Test Mode II and warm it up until engine coolant temperature indicator points to the middle of the gauge.

Next run engine at about 2,000 rpm for about 2 minutes under no-load conditions. Then make sure that the MIL comes ON more than 5 times within 10 seconds with engine running at 2,000 rpm under no-load.

OBD System Operation Chart RELATIONSHIP BETWEEN MIL, 1ST TRIP DTC, DTC, AND DETECTABLE ITEMS

ABS0080W

- 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. For details, refer to <u>EC-696, "Two Trip Detection</u> Logic".
- The MIL will go off after the vehicle is driven 3 times with no malfunction. The 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-II 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 (goes 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)

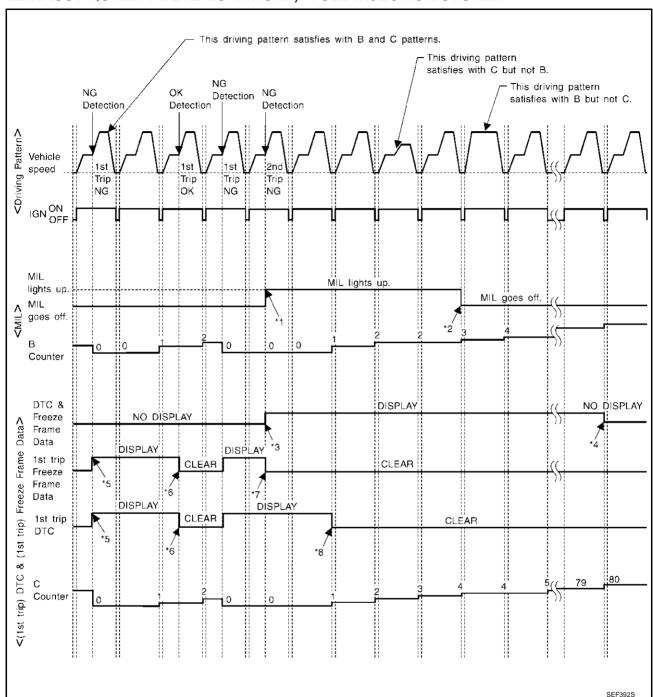
For details about patterns B and C under "Fuel Injection System" and "Misfire", see EC-718.

For details about patterns A and B under "Other", see EC-720.

^{*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"



- *1: When the same malfunction is detected in two consecutive trips, MIL will light up.
- *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 go off after vehicle is driven 3 times (pattern B) without any malfunctions.
- 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.

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[TYPE 2]

EXPLANATION FOR DRIVING PATTERNS FOR "MISFIRE <EXHAUST QUALITY DETERIORATION>", "FUEL INJECTION SYSTEM"

<Driving Pattern B>

Driving pattern B means the vehicle operation as follows:

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 malfunction.
- The MIL will go off when the B counter reaches 3. (*2 in OBD SYSTEM OPERATION CHART)

<Driving Pattern C>

Driving pattern C means the vehicle operation as follows:

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 follows:

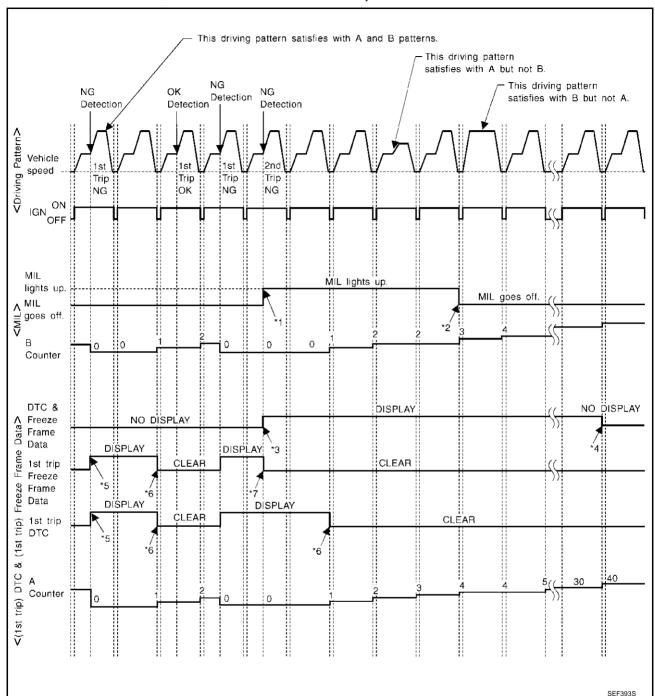
Engine speed: 850 rpm, Calculated load value: 30%, Engine coolant temperature: 80°C (176°F)

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 is 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 <u>EXCEPT</u> FOR "MISFIRE <EXHAUST QUALITY DETERIORATION>", "FUEL INJECTION SYSTEM"



- *1: When the same malfunction is detected in two consecutive trips, MIL will light up.
- *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.)
- *7: When the same malfunction is detected in the 2nd trip, the 1st trip freeze frame data will be cleared.

- *2: MIL will go 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.
- *3: When the same malfunction is detected in two consecutive trips, the DTC and the 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.

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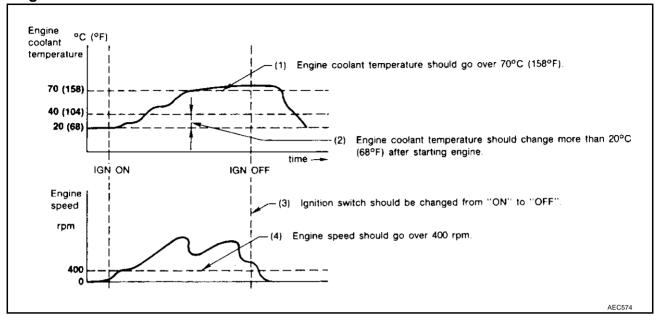
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EXPLANATION FOR DRIVING PATTERNS <u>EXCEPT</u> FOR "MISFIRE <EXHAUST QUALITY DETERIORATION>", "FUEL INJECTION SYSTEM"

<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 the vehicle operation as follows:

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 go off when the B counter reaches 3 (*2 in OBD SYSTEM OPERATION CHART).

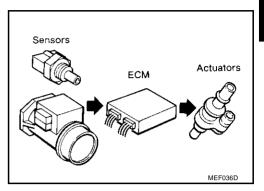
PFP:00004

ARS0080X

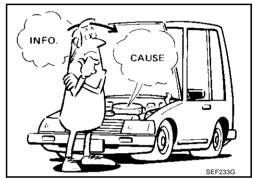
EC

Trouble Diagnosis Introduction INTRODUCTION

The engine has an ECM to control major systems such as fuel control, ignition control, idle air control system, etc. The ECM accepts input signals from sensors and instantly drives actuators. It is essential that both input and output signals are proper and stable. At the same time, it is important that there are no malfunctions such as vacuum leaks, fouled spark plugs, or other malfunctions with the engine.



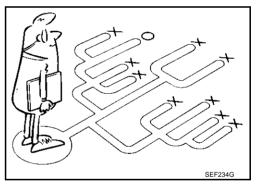
It is much more difficult to diagnose a incident that occurs intermittently rather than continuously. Most intermittent incidents are caused by poor electric connections or improper wiring. In this case, careful checking of suspected circuits may help prevent the replacement of good parts.



A visual check only may not find the cause of the incidents. A road test with CONSULT-II (or GST) or a circuit tester connected should be performed. Follow the Work Flow on $\underline{\text{EC-722}}$.

Before undertaking actual checks, take a few minutes to talk with a customer who approaches with a driveability complaint. The customer can supply good information about such incidents, especially intermittent ones. Find out what symptoms are present and under what conditions they occur. A Diagnostic Worksheet like the example on EC-724 should be used.

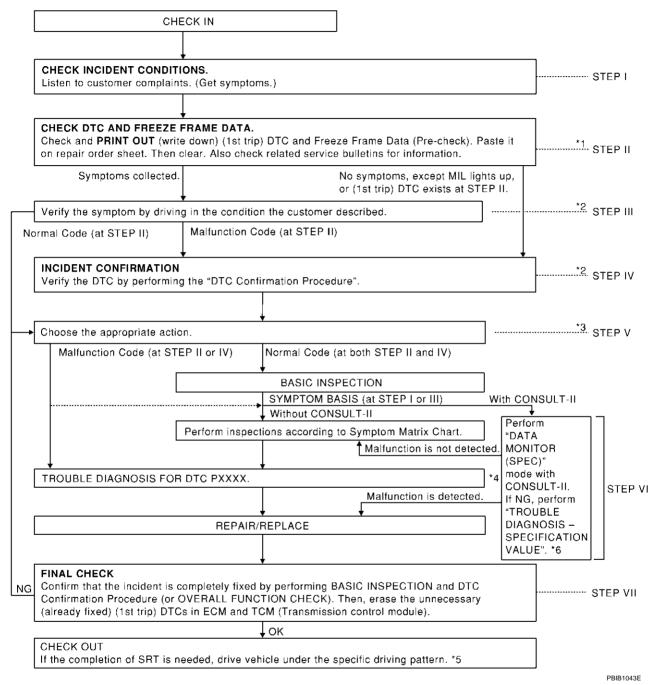
Start your diagnosis by looking for conventional malfunctions first. This will help troubleshoot driveability malfunctions on an electronically controlled engine vehicle.



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Revision; 2004 April EC-721 2003 G35 Sedan

WORK FLOW Flow Chart



- *1 If time data of "SELF-DIAG RESULTS" is other than [0] or [1t], perform <u>EC-780</u>, "TROUBLE DIAG-NOSIS FOR INTERMITTENT INCI-DENT".
- *4 If malfunctioning part cannot be detected, perform <u>EC-780</u>, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".
- *2 If the incident cannot be verified, per- *3 form EC-780, "TROUBLE DIAGNO-SIS FOR INTERMITTENT INCIDENT".
- *5 <u>EC-707</u>

- If the on board diagnostic system cannot be performed, check main power supply and ground circuit.

 Refer to EC-781, "POWER SUPPLY CIRCUIT FOR ECM".
- *6 <u>EC-776</u>

STEP	DESCRIPTION
STEP I	Get detailed information about the conditions and the environment when the incident/symptom occurred using the EC-723, "DIAGNOSTIC WORKSHEET".
STEP II	Before confirming the concern, check and write down (print out using CONSULT-II or GST) the (1st trip) DTC and the (1st trip) freeze frame data, then erase the DTC and the data. (Refer to EC-710 .) The (1st trip) DTC and the (1st trip) freeze frame data can be used when duplicating the incident at STEP III & IV. If the incident cannot be verified, perform EC-780 , "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" . Study the relationship between the cause, specified by (1st trip) DTC, and the symptom described by the customer. (The Symptom Matrix Chart will be useful. See EC-732 .) Also check related service bulletins for information.
STEP III	Try to confirm the symptom and under what conditions the incident occurs. The DIAGNOSTIC WORK SHEET and the freeze frame data are useful to verify the incident. Connect CONSULT-II to the vehicle in DATA MONITOR (AUTO TRIG) mode and check real time diagnosis results. If the incident cannot be verified, perform EC-780 , "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT". If the malfunction code is detected, skip STEP IV and perform STEP V.
STEP IV	Try to detect the (1st trip) DTC by driving in (or performing) the DTC Confirmation Procedure. Check and read the (1st trip) DTC and (1st trip) freeze frame data by using CONSULT-II or GST. During the (1st trip) DTC verification, be sure to connect CONSULT-II to the vehicle in DATA MONITOR (AUTO TRIG) mode and check real time diagnosis results. If the incident cannot be verified, perform EC-780 , "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT". In case the DTC Confirmation Procedure is not available, perform the Overall Function Check instead. The (1st trip) DTC cannot be displayed by this check, however, this simplified check is an effective alternative. The NG result of the Overall Function Check is the same as the (1st trip) DTC detection.
STEP V	Take the appropriate action based on the results of STEP I through IV. If the malfunction code is indicated, proceed to TROUBLE DIAGNOSIS FOR DTC PXXXX. If the normal code is indicated, proceed to the BASIC INSPECTION. (Refer to <u>EC-727</u> .) Then perform inspections according to the Symptom Matrix Chart. (Refer to <u>EC-732</u> .)
STEP VI	Identify where to begin diagnosis based on the relationship study between symptom and possible causes. Inspect the system for mechanical binding, loose connectors or wiring damage using (tracing) Harness Layouts. Gently shake the related connectors, components or wiring harness with CONSULT-II set in "DATA MONITOR (AUTO TRIG)" mode. Check the voltage of the related ECM terminals or monitor the output data from the related sensors with CONSULT-II. Refer to EC-746, EC-770. The Diagnostic Procedure in EC section contains a description based on open circuit inspection. A short circuit inspection is also required for the circuit check in the Diagnostic Procedure. For details, refer to Circuit Inspection in GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident". Repair or replace the malfunction parts. If malfunctioning part cannot be detected, perform EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".
STEP VII	Once you have repaired the circuit or replaced a component, you need to run the engine in the same conditions and circumstances which resulted in the customer's initial complaint. Perform the DTC Confirmation Procedure and confirm the normal code [DTC No. P0000] is detected. If the incident is still detected in the final check, perform STEP VI by using a method different from the previous one. Before returning the vehicle to the customer, be sure to erase the unnecessary (already fixed) (1st trip) DTC in ECM and TCM (Transmission control module). (Refer to EC-710, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" and AT-40, "HOW TO ERASE DTC".)

DIAGNOSTIC WORKSHEET 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 a incident. It is important to fully understand the symptoms or conditions for a customer complaint.

Utilize a diagnostic worksheet like the one on the next page 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.

KEY POINTS

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

SEF907L

[TYPE 2]

Fuel filler cap was left off or incorrectly screwed on, allowing fuel to evaporate into the atmosphere.

Worksheet Sample

Customer na	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	☐ Partial combustion affected by th☐ Partial combustion NOT affected	☐ Partial combustion affected by throttle position ☐ Partial combustion NOT affected by throttle position							
Symptoms										
☐ Stumble ☐ Surge ☐ Knock ☐ Lack of power ☐ Intake backfire ☐ Exhaust backfire ☐ Others []										
	☐ Engine stall	☐ At the time of start ☐ While idling ☐ While accelerating ☐ While dece ☐ Just after stopping ☐ While loads	elerating							
Incident occu	rrence	☐ Just after delivery ☐ Recently☐ In the morning ☐ At night ☐	☐ In the daytime							
Frequency		☐ All the time ☐ Under certain cond	ditions							
Weather con	ditions	☐ Not affected								
	Weather	☐ Fine ☐ Raining ☐ Snowing	Others [
	Temperature	☐ Hot ☐ Warm ☐ Cool ☐	Cold Humid °F							
		☐ Cold ☐ During warm-up ☐ .	After warm-up							
Engine condi	tions	Engine speed	4,000 6,000 8,000 rpm							
Road condition	ons	☐ In town ☐ In suburbs ☐ Hig	nhway							
Driving condi	tions	□ Not affected □ At starting □ While idling □ While accelerating □ While cruis □ While decelerating □ While turni Vehicle speed □ □ □	•							
		0 10 20	30 40 50 60 MPH							
Malfunction in	ndicator lamp	☐ Turned on ☐ Not turned on								

MTBL0017

DTC Inspection Priority Chart

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If some DTCs are displayed at the same time, perform inspections one by one based on the following priority chart.

NOTE:

If DTC U1000 and/or U1001 is displayed with other DTC, first perform the trouble diagnosis for DTC U1000, U1001. Refer to $\underline{\text{EC-788}}$.

Priority	Detected items (DTC)
1	U1000 U1001 CAN communication line
	● P0101 P0102 P0103 Mass air flow sensor
	P0112 P0113 P0127 Intake air temperature sensor
	P0117 P0118 P0125 Engine coolant temperature sensor
	• P0122 P0123 P0222 P0223 P1225 P1226 P2135 Throttle position sensor
	P0128 Thermostat function
	P0181 P0182 P0183 Fuel tank temperature sensor
	P0327 P0328 Knock sensor
	P0335 Crankshaft position sensor (POS)
	P0340 P0345 Camshaft position sensor (PHASE)
	• P0460 P0461 P0462 Fuel level sensor
	P0500 Vehicle speed sensor
	● P0605 ECM
	P0705 Park/Neutral position (PNP) switch
	P1229 Sensor power supply
	• P1610 - P1615 NATS
	P1706 Park/Neutral position (PNP) switch
	P2122 P2123 P2127 P2128 P2138 Accelerator pedal position sensor
2	P0031P0032 P0051 P0052 Heated oxygen sensor 1 heater
	 P0037 P0038 P0057 P0058 Heated oxygen sensor 2 heater
	• P0132 P0133 P0134 P0152 P0153 P0154 P1143 P1144 P1163 P1164 Heated oxygen sensor 1
	• P0138 P0139 P0158 P0159 P1146 P1147 P1166 P1167 Heated oxygen sensor 2
	P0441 EVAP control system purge flow monitoring
	P0444 P0445 P1444 EVAP canister purge volume control solenoid valve
	P0447 P1446 EVAP canister vent control valve
	P0451 P0452 P0453 EVAP control system pressure sensor
	P0550 Power steering pressure sensor
	 P0710 P0720 P0725 P0740 P0744 P0745 P1705 P1716 P1730 P1752 P1754 P1757 P1759 P1762 P1764 P1767 P1769 P1772 P1774 A/T related sensors, solenoid valves and switches
	P1065 ECM power supply
	P1111 P1136 Intake valve timing control solenoid valve
	P1122 Electric throttle control function
	P1124 P1126 P1128 Electric throttle control actuator
	P1217 Engine over temperature (OVERHEAT)
	P1805 Brake switch
3	P0011 P0021 Intake valve timing control
	P0171 P0172 P0174 P0175 Fuel injection system function
	• P0300 - P0306 Misfire
	P0420 P0430 Three way catalyst function
	• P0442 P0455 P0456 EVAP control system
	P0506 P0507 Idle speed control system
	P1121 Electric throttle control actuator
	P1148 P1168 Closed loop control
	P1211 TCS control unit
	P1212 TCS communication line
	P1564 ASCD steering switch
	P1572 ASCD brake switch
	P1574 ASCD vehicle speed sensor

Fail-safe Chart

When the DTC listed below is detected, the ECM enters fail-safe mode and the MIL lights up.

DTC No.	Detected items	Engine operat	ing condition in fail-safe mode							
P0102 P0103	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	Engine coolant temperature will be dignition switch ON or START. CONSULT-II displays the engine cool	determined by ECM based on the time after turning plant temperature decided by ECM.							
		Condition	Engine coolant temperature decided (CONSULT-II display)							
		Just as ignition switch is turned ON or Start	40°C (104°F)							
		More than approx. 4 minutes after ignition ON or Start	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 coolin fan operates while engine is running.								
P0122 P0123 P0222 P0223 P2135	Throttle position sensor	ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. ECM regulates the opening speed of the throttle valve to be slower than the normal codition. So, the acceleration will be poor.								
P1121	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 by regulating the throttle opening to degrees or less.								
		the engine stalls.	e is stuck open:) down gradually by fuel cut. After the vehicle stops, ition, and engine speed will not exceed 1,000 rpm							
P1122	Electric throttle control function	ECM stops the electric throttle control fixed opening (approx. 5 degrees) by	ol actuator control, throttle valve is maintained at a γ the return spring.							
P1124 P1126	Throttle control motor relay	ECM stops the electric throttle control fixed opening (approx. 5 degrees) by	ol actuator control, throttle valve is maintained at a							
P1128	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.								
P1229	Sensor power supply	ECM stops the electric throttle control fixed opening (approx. 5 degrees) by	ol actuator control, throttle valve is maintained at a							
P2122 P2123 P2127 P2128 P2138	Accelerator pedal position sensor	tion ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.								

 When there is an open circuit on MIL circuit, the ECM cannot warn the driver by lighting MIL up when there is malfunction on engine control system.

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 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.

Engine operating condition in fail-safe mode

Engine speed will not rise more than 2,500 rpm due to the fuel cut

Basic Inspection

RS00810

EC

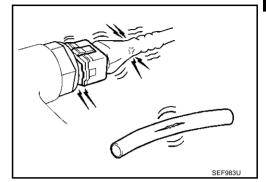
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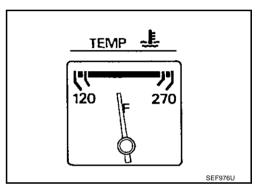
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1. INSPECTION START

- 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 leaks
- Air cleaner clogging
- Gasket
- 3. Confirm 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 the middle of gauge. Ensure engine stays below 1,000 rpm.





- 5. Run engine at about 2,000 rpm for about 2 minutes under no-
- 6. Make sure that no DTC is displayed with CONSULT-II or GST.

OK or NG

OK >> GO TO 3. NG >> GO TO 2.



2. REPAIR OR REPLACE

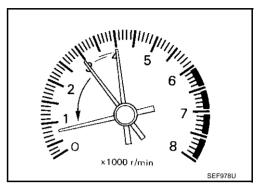
Repair or replace components as necessary according to corresponding Diagnostic Procedure.

>> GO TO 3.

3. CHECK TARGET IDLE SPEED

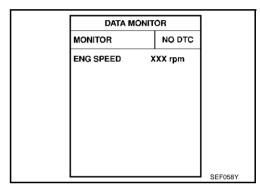
(II) With CONSULT-II

- 1. Run engine at about 2,000 rpm for about 2 minutes under no-load.
- 2. Rev engine (2,000 to 3,000 rpm) two or three times under no-load, then run engine at idle speed for about 1 minute.



3. Read idle speed in "DATA MONITOR" mode with CONSULT-II.

A/T: 650 ± 50 rpm (in P or N position) M/T: 650 ± 50 rpm (in N position)



(R) Without CONSULT-II

- 1. Run engine at about 2,000 rpm for about 2 minutes under no-load.
- 2. Rev engine (2,000 to 3,000 rpm) two or three times under no-load, then run engine at idle speed for about 1 minute.
- 3. Check idle speed.

A/T: 650 ± 50 rpm (in P or N position) M/T: 650 ± 50 rpm (in N position)

OK or NG

OK >> GO TO 10. NG >> GO TO 4.

4. PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING

- Stop engine.
- 2. Perform EC-692, "Accelerator Pedal Released Position Learning".

>> GO TO 5.

5. PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Perform EC-692, "Throttle Valve Closed Position Learning".

>> GO TO 6.

[TYPE 2]

6. PERFORM IDLE AIR VOLUME LEARNING Refer to EC-692, "Idle Air Volume Learning". Is Idle Air Volume Learning carried out successfully? EC YES or NO YES >> GO TO 7. NO >> 1. Follow the instruction of Idle Air Volume Learning. 2. GO TO 4. 7. CHECK TARGET IDLE SPEED AGAIN \Box (P) With CONSULT-II 1. Start engine and warm it up to normal operating temperature. Read idle speed in "DATA MONITOR" mode with CONSULT-II. F A/T: 650 ± 50 rpm (in P or N position) M/T: 650 ± 50 rpm (in N position) (R) Without CONSULT-II 1. Start engine and warm it up to normal operating temperature. Check idle speed. A/T: 650 ± 50 rpm (in P or N position) M/T: 650 ± 50 rpm (in N position) Н OK or NG OK >> GO TO 10. >> GO TO 8. NG 8. DETECT MALFUNCTIONING PART Check the following. Check camshaft position sensor (PHASE) and circuit. Refer to EC-955. Check crankshaft position sensor (POS) and circuit. Refer to EC-949. OK or NG OK >> GO TO 9. NG >> 1. Repair or replace. 2. GO TO 4. 9. CHECK ECM FUNCTION

- 1. Substitute another known-good ECM to check ECM function. (ECM may be the cause of a incident, but this is the rarely the case.)
- 2. Perform initialization of IVIS (NATS) system and registration of IVIS (NATS) ignition key IDs. Refer to EC- 712, "IVIS (Infiniti Vehicle Immobilizer System NATS)".

>> GO TO 4.

10. CHECK IGNITION TIMING

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

A/T: $15 \pm 5^{\circ}$ BTDC (in P or N position) M/T: $15 \pm 5^{\circ}$ BTDC (in N position)

OK or NG

OK >> INSPECTION END NG >> GO TO 11. Timing indicator

11. PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING

- 1. Stop engine.
- 2. Perform EC-692, "Accelerator Pedal Released Position Learning".

>> GO TO 12.

12. PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Perform EC-692, "Throttle Valve Closed Position Learning".

>> GO TO 13.

13. PERFORM IDLE AIR VOLUME LEARNING

Refer to EC-692, "Idle Air Volume Learning".

Is Idle Air Volume Learning carried out successfully?

YES or NO

YES >> GO TO 14.

NO >> 1. Follow the instruction of Idle Air Volume Learning.

2. GO TO 4.

14. CHECK TARGET IDLE SPEED AGAIN

(P) With CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- 2. Read idle speed in "DATA MONITOR" mode with CONSULT-II.

A/T: 650 ± 50 rpm (in P or N position) M/T: 650 ± 50 rpm (in N position)

Without CONSULT-II

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

A/T: 650 ± 50 rpm (in P or N position) M/T: 650 ± 50 rpm (in N position)

OK or NG

OK >> GO TO 15. NG >> GO TO 17.

15. CHECK IGNITION TIMING AGAIN

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

A/T: $15 \pm 5^{\circ}$ BTDC (in P or N position) M/T: $15 \pm 5^{\circ}$ BTDC (in N position)

OK or NG

OK >> INSPECTION END NG >> GO TO 16.

Timing indicator PBIB1655E

16. CHECK TIMING CHAIN INSTALLATION

Check timing chain installation. Refer to EM-54, "TIMING CHAIN" .

OK or NG

OK >> GO TO 17.

NG >> 1. Repair the timing chain installation.

2. GO TO 4.

17. DETECT MALFUNCTIONING PART

Check the following.

- Check camshaft position sensor (PHASE) and circuit. Refer to EC-955.
- Check crankshaft position sensor (POS) and circuit. Refer to EC-949.

OK or NG

OK >> GO TO 18.

NG >> 1. Repair or replace.

2. GO TO 4.

18. CHECK ECM FUNCTION

- Substitute another known-good ECM to check ECM function. (ECM may be the cause of a incident, but this is the rarely the case.)
- 2. Perform initialization of IVIS (NATS) system and registration of IVIS (NATS) ignition key IDs. Refer to EC-712, "IVIS (Infiniti Vehicle Immobilizer System — NATS)".

>> GO TO 4.

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Symptom Matrix Chart SYSTEM — BASIC ENGINE CONTROL SYSTEM

ABS00811

							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
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-1259
	Fuel pressure regulator system	3	3	4	4	4	4	4	4	4		4			EC-694
	Injector circuit	1	1	2	3	2		2	2			2			EC-1253
	Evaporative emission system	3	3	4	4	4	4	4	4	4		4			EC-1292
Air	Positive crankcase ventilation system	3	3	4	4	4	4	4	4	4		4	1		EC-1305
	Incorrect idle speed adjustment						1	1	1	1		1			EC-681
	Electric throttle control actuator	1	1	2	3	3	2	2	2	2		2		2	EC-1064, EC-1066
Ignition	Incorrect ignition timing adjustment	3	3	1	1	1		1	1			1			EC-681
	Ignition circuit	1	1	2	2	2		2	2			2			EC-1241
Main po	wer supply and ground circuit	2	2	3	3	3		3	3		2	3			EC-781
Mass air	flow sensor circuit	1			2										EC-810, EC-818
Engine of	coolant temperature sensor circuit	•					3			3					EC-830, EC-842
Heated	oxygen sensor 1 circuit		1	2	3	2		2	2			2			EC-850, EC-860, EC-873, EC-1082,
Throttle position sensor circuit							2			2					EC-835, EC-931, EC-1147, EC-1149, EC-1225
Accelerator pedal position sensor circuit				3	2	1									EC-1151, EC-1211, EC-1218, EC-1232
Knock sensor circuit				2								3			EC-944
Crankshaft position sensor (POS) circuit		2	2												EC-949
Camshaft position sensor (PHASE) circuit			2												EC-955
Vehicle	Vehicle speed signal circuit			3		3						3			EC-1039
Power steering pressure sensor circuit			2					3	3						EC-1045

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														<u> </u>
						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
Warranty symptom code	AA	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	НА	
ECM	2	2	3	3	3	3	3	3	3	3	3			EC-1050, EC-1053
Intake valve timing control solenoid valve circuit		3	2		1	3	2	2	3		3			EC-1057
PNP switch circuit			3		3		3	3			3			EC-1197
Refrigerant pressure sensor circuit		2				3			3		4			EC-1265
Electrical load signal circuit							3							EC-1270
Air conditioner circuit	2	2	3	3	3	3	3	3	3		3		2	ATC-42
VDC/TCS/ABS control unit			4											BRC-13

^{1 - 6:} The numbers refer to the order of inspection. (continued on next page)

SYSTEM — ENGINE MECHANICAL & OTHER

							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 tank	- 5													FL-12
	Fuel piping			5	5	5		5	5			5			<u>EM-37</u>
	Vapor lock		5												_
	Valve deposit														_
	Poor fuel (Heavy weight gasoline, Low octane)	5		5	5	5		5	5			5			_

		IK	OUI	BLE	: DI	AG	NO:	515							[TYPE 2]
							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
-	ymptom code	AA	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	НА	
Air	Air duct														<u>EM-16</u>
	Air cleaner														<u>EM-16</u>
	Air leakage from air duct (Mass air flow sensor — electric throttle control actuator) Electric throttle control actuator	5	5	5	5	5	5	5	5	5		5			EM-16
	Air leakage from intake manifold/ Collector/Gasket														EM-18, EM-22
Cranking	Battery														<u>SC-4</u>
	Generator circuit	- 1	1	1		1		1	1					1	SC-21
	Starter circuit	3					-			-					<u>SC-9</u>
	Signal plate	6										1			EM-103
	PNP switch	4													<u>AT-110</u> or <u>MT-12</u>
Engine	Cylinder head	_	5	5	E	_		E	_			E			EM 07
	Cylinder head gasket	- 5	Э	Э	5	5		5	5		4	5	3		<u>EM-87</u>
	Cylinder block														
	Piston Piston ring Connecting rod Bearing Crankshaft	6	6	6	6	6		6	6			6	4		EM-103
Valve	Timing chain														EM-54
mecha- nism	Camshaft														<u>EM-71</u>
	Intake valve timing control	5	5	5	5	5		5	5			5			EM-54
	Intake valve												3		EM-87
	Exhaust valve														<u>LIVI OI</u>
Exhaust	Exhaust manifold/Tube/Muffler/ Gasket	5	5	5	5	5		5	5			5			EM-24, EX- 3
	Three way catalyst														
Lubrica- tion	Oil pan/Oil strainer/Oil pump/Oil filter/Oil gallery/Oil cooler	5	5	5	5	5		5	5			5			EM-28, LU- 13 , LU-9 , LU-10
	Oil level (Low)/Filthy oil														LU-6

[TYPE 2]

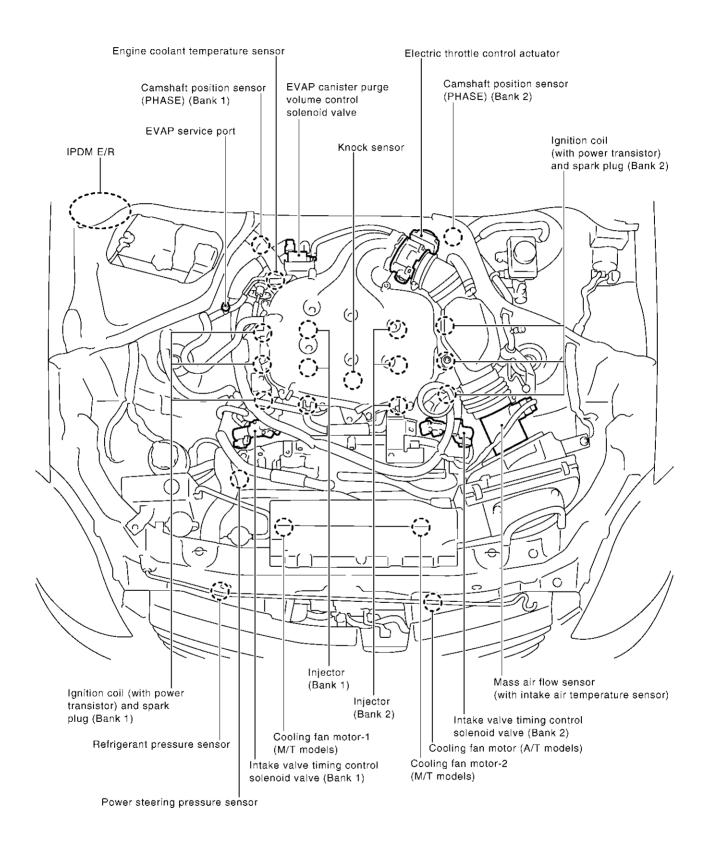
							S'	/MPT	ОМ							۸
		HA)				VIION					Е НІСН					A
		(EXCP. F		SPOT		LERA					TUR	NO	z	(GE)		EC
		START/RESTART (EX		HESITATION/SURGING/FLAT SF	SPARK KNOCK/DETONATION	POWER/POOR ACCELERATION	IDLE	JNTING	NC	SLOW/NO RETURN TO IDLE	TER TEMPERATURE	FUEL CONSUMPTION	CONSUMPTION	(UNDER CHARGE)	Reference page	С
		STAR	STALL	US/NC	IOCK/I	OWE	/LOW	LE/HL	3RATI(RETU	TS/W/		/E OIL	DEAD		D
		HARD/NO	ENGINE S	HESITATIC	SPARK KN	LACK OF F	HIGH IDLE/LOW IDLE	ROUGH IDLE/HUNTING	IDLING VIBRATION	SLOW/NO	OVERHEATS/WATER	EXCESSIVE	EXCESSIVE	BATTERY		Е
Warranty	symptom code	AA	AB	AC	AD	ΑE	AF	AG	АН	AJ	AK	AL	AM	НА		
Cooling	Radiator/Hose/Radiator filler cap														<u>CO-14,</u> <u>CO-18</u>	F
	Thermostat									5					<u>CO-30</u>	
	Water pump	5	5	5	5	5		5	5		4	5			<u>CO-26</u>	G
	Water gallery														<u>CO-32</u>	
	Coolant level (Low)/Contami- nated coolant									5					<u>CO-11</u>	Н
IVIS (Infin NATS)	iti Vehicle Immobilizer System —	1	1												EC-712 or BL-125	ı

^{1 - 6:} The numbers refer to the order of inspection.

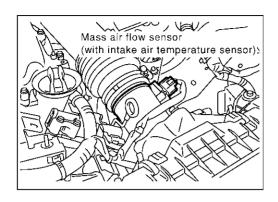
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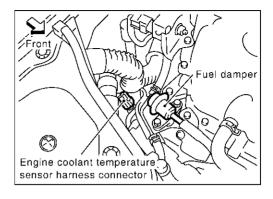
Engine Control Component Parts Location

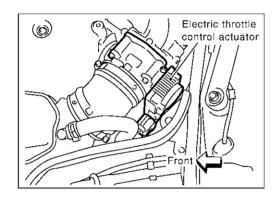
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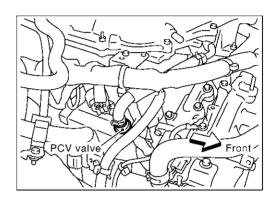


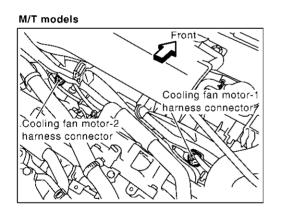
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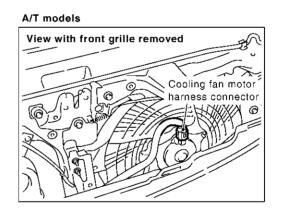


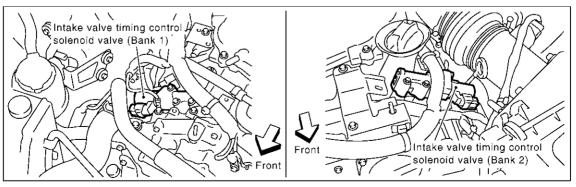












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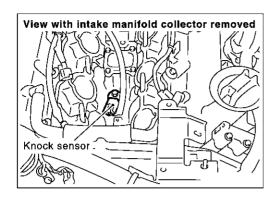
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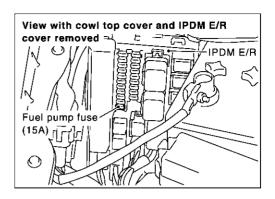
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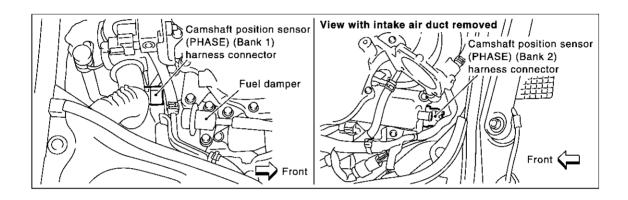
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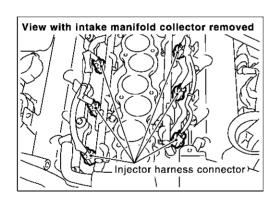
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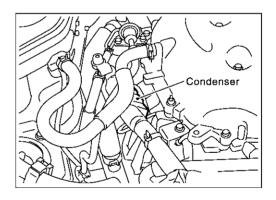
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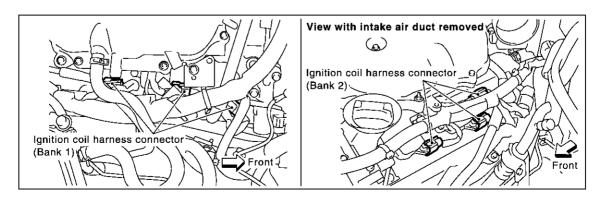




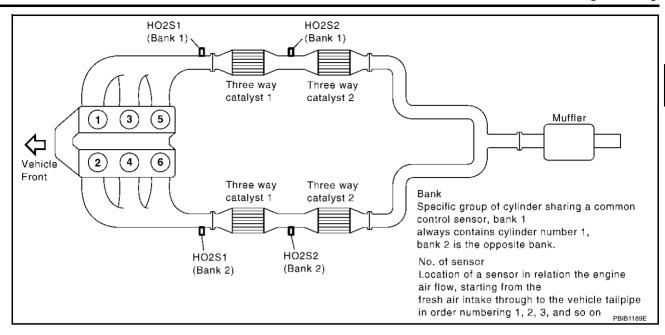


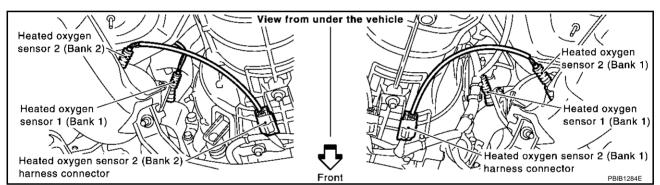






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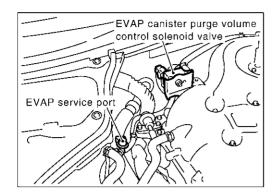
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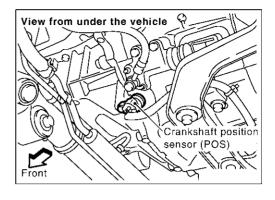
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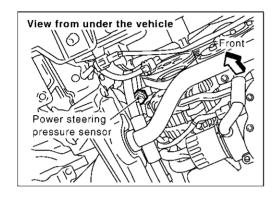
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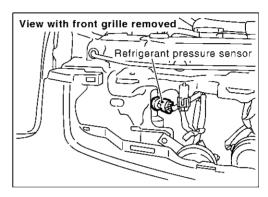
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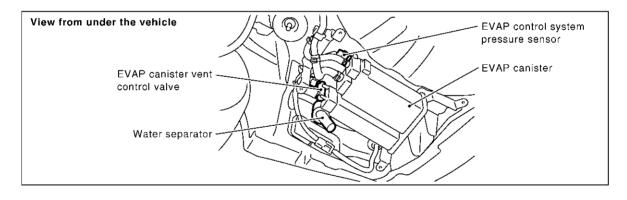
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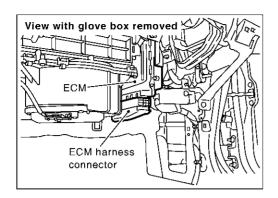


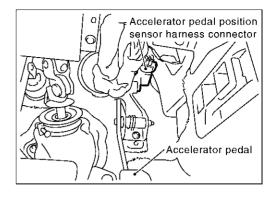


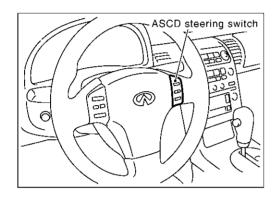


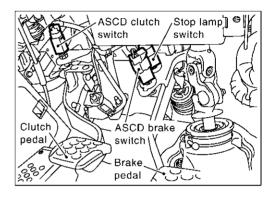


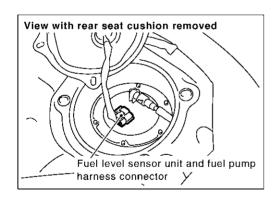
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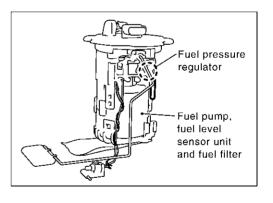












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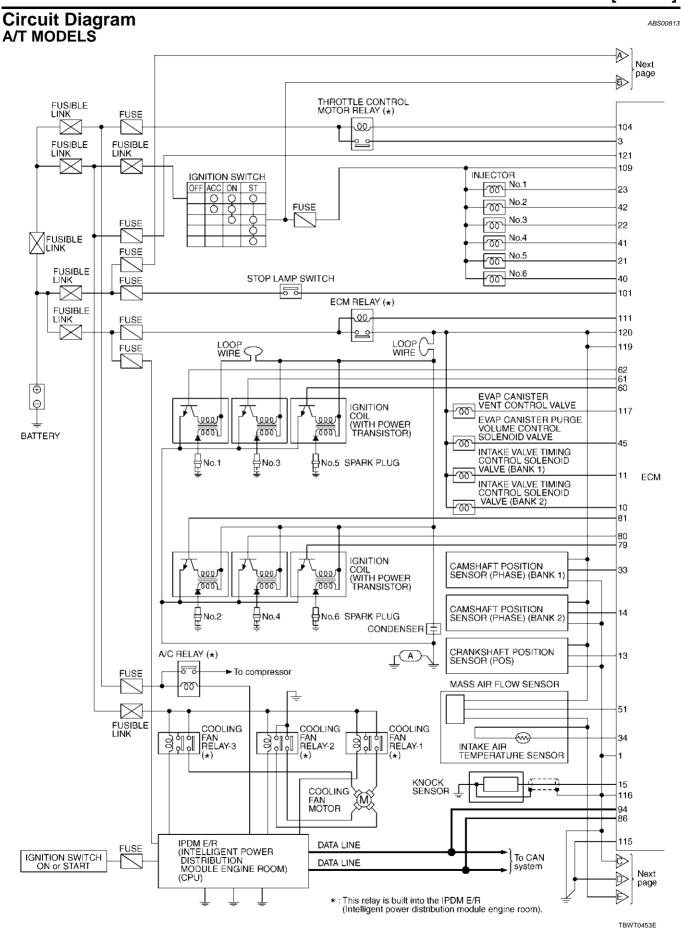
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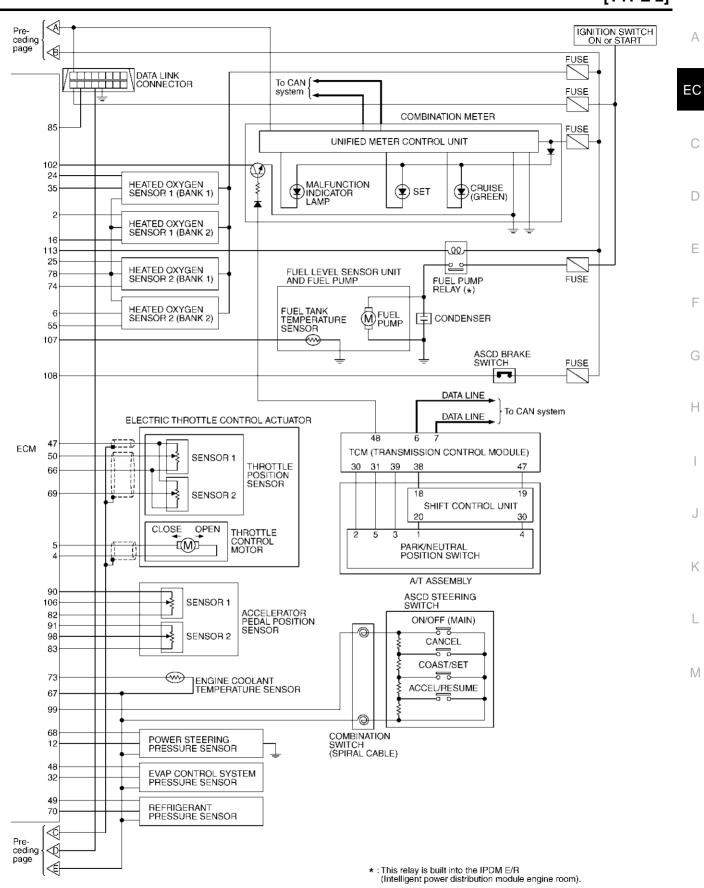
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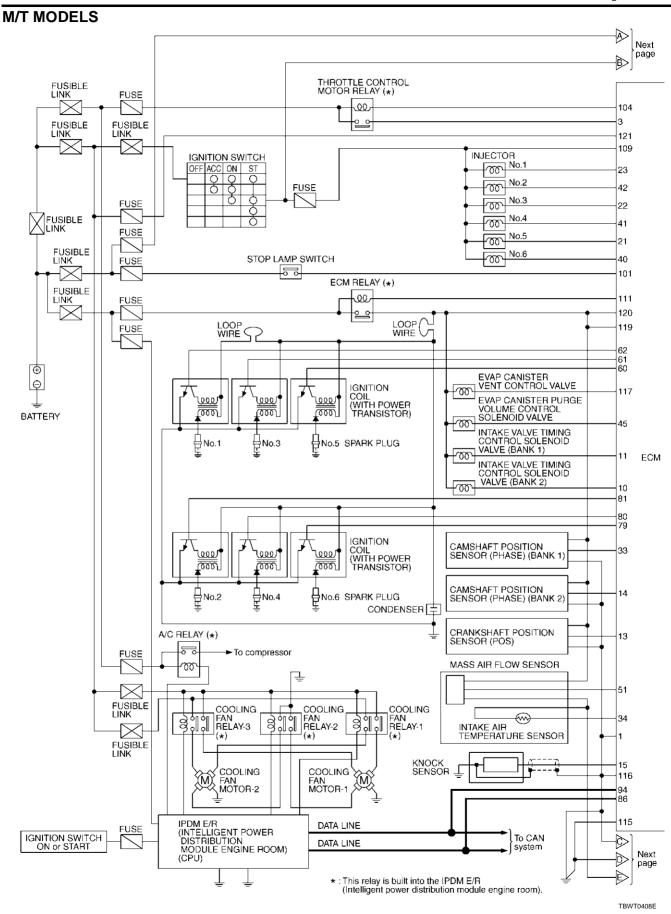
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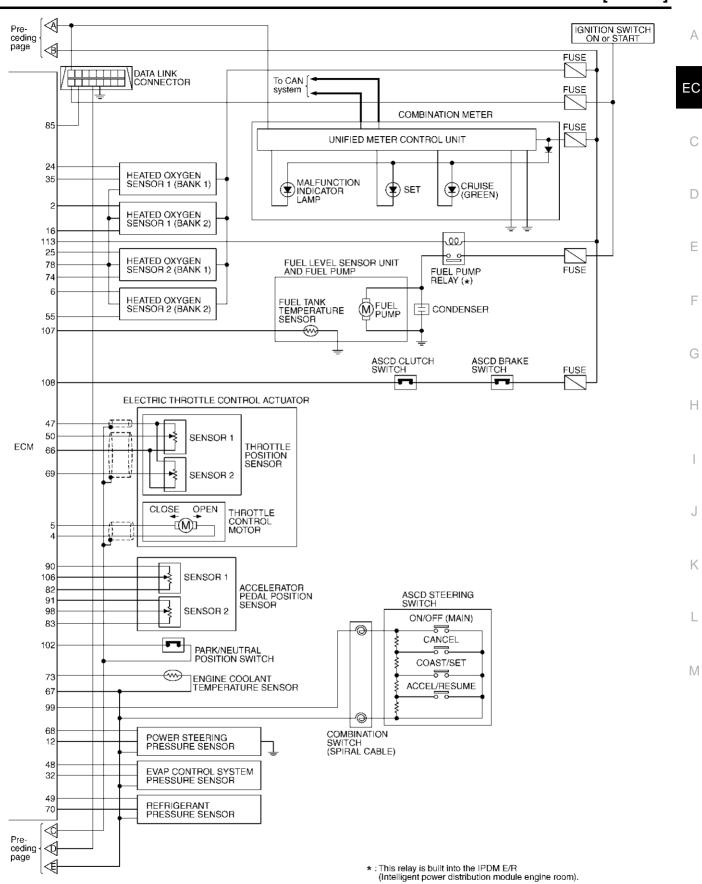
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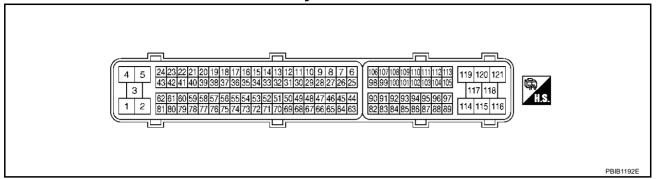




TBWT0409E

ECM Harness Connector Terminal Layout

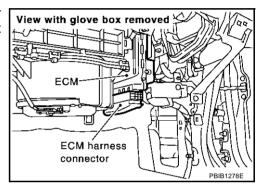
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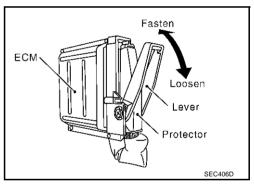
ECM Terminals and Reference Value PREPARATION

ABS00815

- 1. ECM is located behind the passenger side instrument lower panel. For this inspection, remove passenger side instrument lower panel.
- Remove ECM harness connector.



- 3. When disconnecting ECM harness connector, loosen it with levers as far as they will go as shown at right.
- 4. Connect a break-out box (SST) and Y-cable adapter (SST) between the ECM and ECM harness connector.
 - Use extreme care not to touch 2 pins at one time.
 - Data is for comparison and may not be exact.



ECM INSPECTION TABLE

Specification data are reference values and are measured between each terminal and ground. Pulse signal is measured by CONSULT-II.

CAUTION

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECMs transistor. Use a ground other than ECM terminals, such as the ground.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
1	В	ECM ground	[Engine is running] ● Idle speed	Engine ground

				[TYPE 2]	
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)	А
2	Y	Heated oxygen sensor 1 heater (bank 2)	[Engine is running]Warm-up conditionEngine speed is below 3,600 rpm.	Approximately 8V★ Interpretation PBIB0519E	EC C
			[Engine is running]	BATTERY VOLTAGE (11 - 14V)	D
3	W/R	Throttle control motor relay power supply	Engine speed is above 3,600 rpm. [Ignition switch: ON]	BATTERY VOLTAGE (11 - 14V)	Е
4	BR	Throttle control motor (Close)	[Ignition switch: ON] • Engine stopped • Shift lever: D (A/T) or 1st (M/T)	0 - 14∨★	F
		(Cicco)	Accelerator pedal is releasing	>> 5 V/Div 1 ms/Div [1] PBIB1104E	G
5	G	Throttle control motor (Open)	 [Ignition switch: ON] Engine stopped Shift lever: D (A/T) or 1st (M/T) Accelerator pedal is depressing 	0 - 14V★ >> 5 \(\text{V/Div}\) 1 \(\text{ms/Div}\) 1 \(\text{PBIB1105E}\)	H
6	BR/W	Heated oxygen sensor 2 heater (bank 2)	 [Engine is running] Engine speed is 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. 	0 - 1.0V	K
			 [Ignition switch: ON] Engine stopped [Engine is running] Engine speed is above 3,600 rpm. 	BATTERY VOLTAGE (11 - 14V)	M
			[Engine is running]● Warm-up condition● Idle speed	BATTERY VOLTAGE (11 - 14V)	
10	W/G	Intake valve timing control solenoid valve (bank 2)	 [Engine is running] Warm-up condition When revving engine up to 2,500 rpm quickly 	7 - 12V★	

				[TYPE 2]
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
			[Engine is running] • Warm-up condition • Idle speed	BATTERY VOLTAGE (11 - 14V)
11	R/W	Intake valve timing control solenoid valve (bank 1)	 [Engine is running] Warm-up condition When revving engine up to 2,500 rpm quickly 	7 - 12V★ 10.0 V/Div PBIB1790E
12	L/W	Power steering pressure sensor	 [Engine is running] Steering wheel is being turned. [Engine is running] Steering wheel is not being turned. 	0.5 - 4.5V 0.4 - 0.8V
		Crankshaft position sensor	[Engine is running] • Warm-up condition • Idle speed	Approximately 1.2V★ S.0 V/Div 1 ms/Div T PBIB1041E
13	BR	(POS)	[Engine is running] ● Engine speed is 2,000 rpm.	Approximately 1.1V★ → 5.0 V/Div 1 ms/Div T PBIB1042E
14	V	Camshaft position sensor	[Engine is running]Warm-up conditionIdle speed	1.0 - 4.0 V★ 1.0 - 4.0 V★
14	Y	Camshaft position sensor (PHASE) (bank 2)	[Engine is running] ● Engine speed is 2,000 rpm.	1.0 - 4.0 V★ >>> 5.0 V/Div 20 ms/Div PBIB1040E
15	W	Knock sensor	[Engine is running] • Idle speed	Approximately 2.5V
16	LG	Heated oxygen sensor 1 (bank 2)	[Engine is running] • Warm-up condition • Engine speed is 2,000 rpm.	0 - Approximately 1.0V (Periodically change)

				[11PE 2]	ı
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)	А
21	G	Injector No. 5	[Engine is running] • Warm-up condition • Idle speed	BATTERY VOLTAGE (11 - 14V)* A 10.0 V/DW 50 ms/Div SEC984C	EC C
22 23	R/Y R/B	Injector No. 3 Injector No. 1	[Engine is running]Warm-up conditionEngine speed is 2,000 rpm.	BATTERY VOLTAGE (11 - 14V)* Indicate the second of the s	E F
24	G/B	Heated oxygen sensor 1 heater (bank 1)	 [Engine is running] Warm-up condition Engine speed is below 3,600 rpm. 	Approximately 8V★	Н
			[Engine is running] ● Engine speed is above 3,600 rpm.	BATTERY VOLTAGE (11 - 14V)	J
25	P/B	Heated oxygen sensor 2 heater (bank 1)	 [Engine is running] Engine speed is 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. 	0 - 1.0V	K
			 [Ignition switch: ON] Engine stopped [Engine is running] Engine speed is above 3,600 rpm. 	BATTERY VOLTAGE (11 - 14V)	M
32	Р	EVAP control system pressure sensor	[Ignition switch: ON]	Approximately 1.8 - 4.8V	

				[= 2]	
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)	
33	OR	• Idle speed Camshaft position sensor			
	O.K	(PHASE) (bank 1)	(PHASE) (bank 1) [Engine is running] ● Engine speed is 2,000 rpm.		1.0 - 4.0 V★ 3.5.0 V/Div 20 ms/Div PBIB1040E
34	Y/G	Intake air temperature sensor	[Engine is running]	Approximately 0 - 4.8V Output voltage varies with intake air temperature.	
35	W/B	Heated oxygen sensor 1 (bank 1)	[Engine is running]Warm-up conditionEngine speed is 2,000 rpm.	0 - Approximately 1.0V (Periodically change)	
40	P	Injector No. 6	[Engine is running] • Warm-up condition • Idle speed	BATTERY VOLTAGE (11 - 14V)★ Interpretation of the state of the stat	
41 42	R/L R/W	/L Injector No. 4	[Engine is running]Warm-up conditionEngine speed is 2,000 rpm	BATTERY VOLTAGE (11 - 14V)* Indicate the state of the s	

				[TYPE 2]
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
		EVAP canister purge vol-	[Engine is running] • Idle speed	BATTERY VOLTAGE (11 - 14V)★
45	LY	ume control solenoid valve	 [Engine is running] Engine speed is about 2,000 rpm (More than 100 seconds after starting engine). 	BATTERY VOLTAGE (11 - 14V)* INTERPRETATION OF THE PROPERTY O
47	В	Sensors' power supply (Throttle position sensor)	[Ignition switch: ON]	Approximately 5V
48	B/Y	Sensors' power supply (EVAP control system pres- sure sensor)	[Ignition switch: ON]	Approximately 5V
49	W/L	Sensors' power supply (Refrigerant pressure sen- sor)	[Ignition switch: ON]	Approximately 5V
		[Ignition switch: ON] ■ Engine stopped ■ Shift lever: D (A/T) or 1st (M/T) ■ Accelerator pedal fully released	More than 0.36V	
50	W	Throttle position sensor 1	 [Ignition switch: ON] Engine stopped Shift lever: D (A/T) or 1st (M/T) Accelerator pedal fully depressed 	Less than 4.75V
51	OR	Mass air flow sensor	[Engine is running] • Warm-up condition • Idle speed [Engine is running] • Warm-up condition	1.1 - 1.5V 1.7 - 2.4V
55	R/Y	Heated oxygen sensor 2 (bank 2)	 Engine speed is 2,500 rpm. [Engine is running] Warm-up condition Revving engine from idle to 3,000 rpm quickly after the following conditions are met. After keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load. 	0 - Approximately 1.0V

				[TYPE 2]
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
60	PU/W L/R Y/R	W Ignition signal No. 5 Ignition signal No. 3 Ignition signal No. 1	[Engine is running] • Warm-up condition • Idle speed	0 - 0.2V★
61 62			[Engine is running]Warm-up conditionEngine speed is 2,500 rpm.	0.1 - 0.4V★
66	W/R	Sensors' ground (Throttle position sensor)	[Engine is running]Warm-up conditionIdle speed	Approximately 0V
67	B/W	Sensors' ground (Mass air flow sensor / IAT sensor / Power steering pressure sensor / EVAP control system pressure sensor / ASCD steering switch)	[Engine is running] • Warm-up condition • Idle speed	Approximately 0V
68	Υ	Sensors' power supply (Power steering pressure sensor)	[Ignition switch: ON]	Approximately 5V
69	R/L	/L Throttle position sensor 2	 [Ignition switch: ON] Engine stopped Shift lever: D (A/T) or 1st (M/T) Accelerator pedal fully released 	Less than 4.75V
			 [Ignition switch: ON] Engine stopped Shift lever: D (A/T) or 1st (M/T) Accelerator pedal fully depressed 	More than 0.36V
70	R/B	Refrigerant pressure sensor	 [Engine is running] Warm-up condition Both A/C switch and blower switch are ON. (Compressor operates.) 	1.0 - 4.0V
73	Y/B	Engine coolant temperature sensor	[Engine is running]	Approximately 0 - 4.8V Output voltage varies with engine coolant temperature.
74	L/B	Heated oxygen sensor 2 (bank 1)	 [Engine is running] Warm-up condition Revving engine from idle to 3,000 rpm quickly after the following conditions are met. After keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load. 	0 - Approximately 1.0V

				[TYPE 2]	
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)	А
78	B/Y	Sensors' ground (Heated oxygen sensor)	[Engine is running]Warm-up conditionIdle speed	Approximately 0V	EC
79 80	GY/R GY	Ignition signal No. 6 Ignition signal No. 4	[Engine is running] ■ Warm-up condition ■ Idle speed	0 - 0.2V★	D
81	G/R	Ignition signal No. 2	[Engine is running]Warm-up conditionEngine speed is 2,500 rpm.	0.1 - 0.4V★	
82	GY/L	Sensors' ground (APP sensor 1)	[Engine is running] • Warm-up condition • Idle speed	Approximately 0V	Н
83	B/R	Sensors' ground (APP sensor 2)	[Engine is running] • Warm-up condition • Idle speed	Approximately 0V	I
85	PU	Data link connector	[Ignition switch: ON] • CONSULT-II or GST is disconnected.	Approximately 5V - Battery voltage (11 - 14V)	J
86	R	CAN communication line	[Ignition switch: ON]	Approximately 1.1 - 2.3V Output voltage varies with the communication status.	K
90	BR/Y	Sensors' power supply (APP sensor 1)	[Ignition switch: ON]	Approximately 5V	
91	G	Sensors' power supply (APP sensor 2)	[Ignition switch: ON]	Approximately 5V	L
94	L	CAN communication line	[Ignition switch: ON]	Approximately 2.6 - 3.2V Output voltage varies with the communication status.	N
98	LG/B	Accelerator pedal position sensor 2	[Ignition switch: ON] • Engine stopped • Accelerator pedal fully released [Ignition switch: ON]	0.15 - 0.60V	
			Engine stoppedAccelerator pedal fully depressed		

TER-				[TYPE
MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
			[Ignition switch: ON] • ASCD steering switch is released.	Approximately 4V
			[Ignition switch: ON] • CRUISE switch is pressed.	Approximately 0V
99	G/Y	ASCD steering switch	[Ignition switch: ON] • CANCEL switch is pressed.	Approximately 1V
			[Ignition switch: ON] • COAST/SET switch is pressed.	Approximately 2V
			[Ignition switch: ON] • ACCEL/RESUME switch is pressed.	Approximately 3V
101	P/L	Stop lamp switch	[Ignition switch: ON] • Brake pedal is fully released	Approximately 0V
101	176	Stop lamp switch	[Ignition switch: ON] • Brake pedal is depressed	BATTERY VOLTAGE (11 - 14V)
102	G/OR	G/OR PNP switch	[Ignition switch: ON] ■ Shift lever: P or N (A/T), Neutral (M/T)	Approximately 0V
102	G/GIX		[Ignition switch: ON] • Except the above gear position	BATTERY VOLTAGE (11 - 14V)
104	G/W	Throttle control motor relay	[Ignition switch: OFF]	BATTERY VOLTAGE (11 - 14V)
			[Ignition switch: ON]	0 - 1.0V
	BR	Accelerator pedal position sensor 1	[Ignition switch: ON]	
			Engine stopped	0.5 - 1.0V
106			Accelerator pedal fully released	
			[Ignition switch: ON]	0.0 4.71/
			Engine stopped	3.9 - 4.7V
107	L/OR	Fuel tank temperature sensor	Accelerator pedal fully depressed [Engine is running]	Approximately 0 - 4.8V Output voltage varies with fue tank temperature.
108	SB	ASCD brake switch	 [Ignition switch: ON] Brake pedal is depressed (A/T models) Brake pedal and/or clutch pedal are depressed (M/T models) 	Approximately 0V
3 -		ASOD DIAKE SWILLII	 [Ignition switch: ON] Brake pedal is fully released (A/T models) Brake pedal and clutch pedal are fully released (M/T models) 	BATTERY VOLTAGE (11 - 14V)
			[Ignition switch: OFF]	0V
109	W/L	Ignition switch	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14V)
111	W	ECM relay	[Engine is running][Ignition switch: OFF]For a few seconds after turning ignition switch OFF	0 - 1.5V
		(Self shut-off)	[Ignition switch: OFF] • A few seconds passed after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)

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TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
113	B/OR	Fuel pump relay	[Ignition switch: ON] • For 1 second after turning ignition switch ON [Engine is running]	0 - 1.5V
110	B/OR	Taci pump relay	[Ignition switch: ON] • More than 1 second after turning ignition switch ON.	BATTERY VOLTAGE (11 - 14V)
115 116	B/R B	ECM ground	[Engine is running] • Idle speed	Engine ground
117	GY/L	EVAP canister vent control valve	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14V)
119 120	P L	Power supply for ECM	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14V)
121	R/W	Power supply for ECM (Buck-up)	[Ignition switch: OFF]	BATTERY VOLTAGE (11 - 14V)

^{★:} Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

CONSULT-II Function FUNCTION

Function Diagnostic test mode This mode enables a technician to adjust some devices faster and more accurately by following the Work support indications on the CONSULT-II unit. Self-diagnostic results such as 1st trip DTC, DTCs and 1st trip freeze frame data or freeze frame data Self-diagnostic results can be read and erased quickly.* Input/Output data in the ECM can be read. Data monitor Input/Output of the specification for Basic fuel schedule, AFM, A/F feedback control value and the Data monitor (SPEC) other data monitor items can be read. CAN diagnostic support The results of transmit/receive diagnosis of CAN communication can be read. monitor Diagnostic Test Mode in which CONSULT-II drives some actuators apart from the ECMs and also Active test shifts some parameters in a specified range. DTC & SRT confirmation The status of system monitoring tests and the self-diagnosis status/result can be confirmed. Function test This mode is used to inform customers when their vehicle condition requires periodic maintenance. ECM part number ECM part number can be read.

- Diagnostic trouble codes
- 1st trip diagnostic trouble codes
- Freeze frame data
- 1st trip freeze frame data
- System readiness test (SRT) codes
- Test values
- Others

Revision; 2004 April EC-755 2003 G35 Sedan

^{*:} The following emission-related diagnostic information is cleared when the ECM memory is erased.

ENGINE CONTROL COMPONENT PARTS/CONTROL SYSTEMS APPLICATION

			DIAGNOSTIC TEST MODE							
			SELF-DIAGNOSTIC RESULTS			DATA			DTC & SRT CONFIRMATION	
	Item		WORK SUP- PORT	DTC*1	FREEZE FRAME DATA*2	DATA MONI- TOR	MONI- TOR (SPEC)	ACTIVE TEST	SRT STATUS	DTC WORK SUP- PORT
		Crankshaft position sensor (POS)		×	×	×	×			
		Camshaft position sensor (PHASE)		×	×	×	×			
		Mass air flow sensor		×		×	×			
		Engine coolant temperature sensor		×	×	×	×	×		
		Heated oxygen sensor 1		×		×	×		×	×
		Heated oxygen sensor 2		×		×	×		×	×
		Vehicle speed sensor		×	×	×	×			
		Accelerator pedal position sensor		×		×	×			
TS		Throttle position sensor		×		×	×			
PAR		Fuel tank temperature sensor		×		×	×	×		
NENT		EVAP control system pressure sensor		×		×	×			
PO		Intake air temperature sensor		×	×	×	×			
SO	INPUT	Knock sensor		×						
9	Z	Refrigerant pressure sensor				×	×			
ENGINE CONTROL COMPONENT PARTS		Closed throttle position switch (accelerator pedal position sensor signal)				×	×			
N S		Air conditioner switch				×	×			
EN I		Park/neutral position (PNP) switch		×		×	×			
		Stop lamp switch		×		×	×			
		Power steering pressure sensor		×		×	×			
		Battery voltage				×	×			
		Load signal				×	×			
		Fuel level sensor		×		×	×			
		ASCD steering switch		×		×	×			
		ASCD brake switch		×		×	×			
		ASCD clutch switch		×		×	×			

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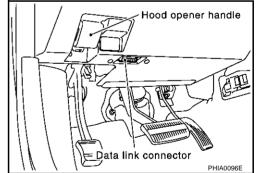
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					DIAC	NOSTIC	TEST MOI	DE		
				_	AGNOSTIC SULTS		DATA		DTC & SRT CONFIRMATION	
		Item	WORK SUP- PORT	DTC*1	FREEZE FRAME DATA*2	DATA MONI- TOR	MONI- TOR (SPEC)	ACTIVE TEST	SRT STATUS	DTC WORK SUP- PORT
		Injectors				×	×	×		
PARTS		Power transistor (Ignition timing)				×	×	×		
		Throttle control motor relay		×		×	×			
		Throttle control motor		×						
ENGINE CONTROL COMPONENT		EVAP canister purge volume control solenoid valve		×		×	×	×		×
	5	Air conditioner relay				×	×			
	JTPI	Fuel pump relay	×			×	×	×		
	5	Cooling fan relay		×		×	×	×		
		Heated oxygen sensor 1 heater		×		×	×		×	
		Heated oxygen sensor 2 heater		×		×	×		×	
		EVAP canister vent control valve	×	×		×	×	×		
Ë		Intake valve timing control solenoid valve		×		×	×	×		
		Calculated load value			×	×	×			

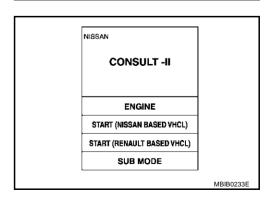
X: Applicable

INSPECTION PROCEDURE

- Turn ignition switch OFF.
- 2. Connect "CONSULT-II" and "CONSULT-II CONVERTER" to data link connector, which is located under LH dash panel near the hood opener handle.
- 3. Turn ignition switch ON.



4. Touch "START (NISSAN BASED VHCL)".



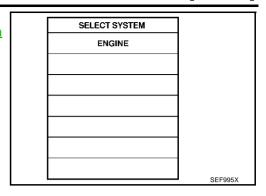
Revision; 2004 April EC-757 2003 G35 Sedan

^{*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-II screen in freeze frame data mode only if a 1st trip DTC or DTC is detected. For details, refer to EC-701.

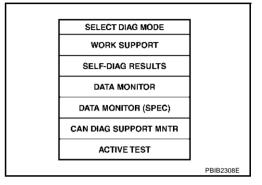
[TYPE 2]

 Touch "ENGINE".
 If "ENGINE" is not indicated, go to GI-38, "CONSULT-II Data Link Connector (DLC) Circuit".



6. Perform each diagnostic test mode according to each service procedure.

For further information, see the CONSULT-II Operation Manual.



WORK SUPPORT MODE

Work Item

WORK ITEM	CONDITION	USAGE
FUEL PRESSURE RELEASE	FUEL PUMP WILL STOP BY TOUCHING "START" DUR- ING 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 RATIO RETURNS TO THE ORIGINAL COEF- FICIENT.	When clearing the coefficient of self-learning control value
EVAP SYSTEM CLOSE	CLOSE THE EVAP CANISTER VENT CONTROL VALVE IN ORDER TO MAKE EVAP SYSTEM CLOSE UNDER THE FOLLOWING CONDITIONS.	When detecting EVAP vapor leak point of EVAP system
	• IGN SW "ON"	
	ENGINE NOT RUNNING	
	AMBIENT TEMPERATURE IS ABOVE 0°C (32°F).	
	NO VACUUM AND NO HIGH PRESSURE IN EVAP SYSTEM	
	• FUEL TANK TEMP. 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- II WILL DISCONTINUE IT AND DISPLAY APPROPRI- ATE INSTRUCTION.	
	NOTE: WHEN STARTING ENGINE, CONSULT-II MAY DISPLAY "BATTERY VOLTAGE IS LOW. CHARGE BATTERY", EVEN IN USING CHARGED BATTERY.	

[TYPE 2]

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WORK ITEM	CONDITION	USAGE
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-655, "INDEX FOR DTC" .)

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, it is displayed as PXXXX. (Refer to EC-655, "INDEX FOR DTC".)
FUEL SYS-B1	"Fuel injection system status" at the moment a malfunction is detected is displayed.
FUEL SYS-B2	One mode in the following is displayed. Mode2: Open loop due to detected system malfunction Mode3: Open loop due to driving conditions (power enrichment, deceleration enrichment) 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 TRIM-B1 [%]	"Long-term fuel trim" at the moment a malfunction is detected is displayed.
L-FUEL TRIM-B2 [%]	The long-term fuel trim indicates much more gradual feedback compensation to the base fuel schedule than short-term fuel trim.
S-FUEL TRIM-B1 [%]	"Short-term fuel trim" at the moment a malfunction is detected is displayed.
S-FUEL TRIM-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.
VEHICL SPEED [km/ h] or [mph]	The vehicle speed 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.

^{*:} This item is the same as that of 1st trip freeze frame data.

DATA MONITOR MODE Monitored Item

x: Applicable

Monitored item [Unit]	ECM INPUT SIG- NALS	MAIN SIG- NALS	Description	Remarks
ENG SPEED [rpm]	×	×	Indicates the engine speed computed from the signal of the crankshaft position sensor (POS) and camshaft position sensor (PHASE).	 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 [V]	×	×	The signal voltage of the mass air flow sensor is displayed.	When the engine is stopped, a certain value is indicated.

				[TYPE 2]
Monitored item [Unit]	ECM INPUT SIG- NALS	MAIN SIG- NALS	Description	Remarks
B/FUEL SCHDL [msec]		×	"Base fuel schedule" indicates the fuel injection pulse width programmed into ECM, prior to any learned on board correction.	
A/F ALPHA-B1 [%]		×		When the engine is stopped, a cer-
A/E ALDUA D2 (9/1			The mean value of the air-fuel ratio feedback correction factor per cycle is indicated.	tain value is indicated. This data also includes the data for
A/F ALPHA-B2 [%]		×	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	the air-fuel ratio learning control.
COOLAN TEMP/S [°C] or [°F]	×	×	The engine coolant temperature (determined by the signal voltage of the engine coolant temper- ature sensor) is displayed.	When the engine coolant temperature sensor is open or short-circuited, ECM enters fail-safe mode. The engine coolant temperature determined by the ECM is displayed.
HO2S1 (B1) [V]	×	×	The signal voltage of the heated oxygen sensor	
HO2S1 (B2) [V]	×		1 is displayed.	
HO2S2 (B1) [V]	×		The signal voltage of the heated oxygen sensor	
HO2S2 (B2) [V]	×		2 is displayed.	
HO2S1 MNTR (B1) [RICH/LEAN]	×	×	Display of heated oxygen sensor 1 signal dur- ing air-fuel ratio feedback control: Control	After turning ON the ignition switch, "RICH" is displayed until air-fuel mix-
HO2S1 MNTR (B2) [RICH/LEAN]	×		RICH: means the mixture became "rich", and control is being affected toward a leaner mixture. LEAN: means the mixture became "lean", and control is being affected toward a rich mixture.	 ture ratio feedback control begins. When the air-fuel ratio feedback is clamped, the value just before the clamping is displayed continuously.
HO2S2 MNTR (B1) [RICH/LEAN]	×		Display of heated oxygen sensor 2 signal: RICH: means the amount of oxygen after three	When the engine is stopped, a cer-
HO2S2 MNTR (B2) [RICH/LEAN]	×		way catalyst is relatively small. LEAN: means the amount of oxygen after three way catalyst is relatively large.	tain value is indicated.
VHCL SPEED SE [km/h] or [mph]	×	×	 The vehicle speed computed from the vehicle speed signal sent from combination meter is displayed. 	
BATTERY VOLT [V]	×	×	The power supply voltage of ECM is displayed.	
ACCEL SEN 1 [V]	×	×	The accelerator pedal position sensor signal	
ACCEL SEN 2 [V]	×		voltage is displayed.	
THRTL SEN 1 [V]	×	×	The throttle position sensor signal voltage is	
THRTL SEN 2 [V]	×		displayed.	
FUEL T/TEMP SE [°C] or [°F]	×		 The fuel temperature (determined by the signal voltage of the fuel tank temperature sensor) is displayed. 	
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 displayed regardless of the starter signal.

[TYPE 2]

Monitored item [Unit]	ECM INPUT SIG- NALS	MAIN SIG- NALS	Description	Remarks
CLSD THL POS [ON/OFF]	×	×	 Indicates idle position [ON/OFF] computed by ECM according to the accelerator pedal posi- tion 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) switch signal.	
PW/ST SIGNAL [ON/OFF]	×	×	 [ON/OFF] condition of the power steering sys- tem (determined by the signal voltage of the power steering pressure sensor signal) is indi- cated. 	
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 [msec]		×	Indicates the actual fuel injection pulse width compensated by ECM according to the input	When the engine is stopped, a cer-
INJ PULSE-B2 [msec]			signals.	tain 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) [°CA] INT/V TIM (B2) [°CA]			Indicates [°CA] of intake camshaft advanced angle.	
INT/V SOL (B1) [%]			 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 	
AIR COND RLY [ON/OFF]		×	 value increases. The air conditioner relay control condition (determined by ECM according to the input signals) is indicated. 	

				[TYPE 2]
Monitored item [Unit]	ECM INPUT SIG- NALS	MAIN SIG- NALS	Description	Remarks
FUEL PUMP RLY [ON/OFF]		×	 Indicates the fuel pump relay control condition determined by ECM according to the input sig- nals. 	
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. 	
COOLING FAN [HI/LOW/OFF]			 The control condition of the cooling fan (determined by ECM according to the input signals) is indicated. HI: High speed operation LOW: Low speed operation OFF: Stop 	
HO2S1 HTR (B1) [ON/OFF] HO2S1 HTR (B2)			Indicates [ON/OFF] condition of heated oxygen sensor 1 heater determined by ECM according	
[ON/OFF]			to the input signals.	
HO2S2 HTR (B1) [ON/OFF]			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 turbine revolution sensor signal.	
VEHICLE SPEED [km/h] or [MPH]			 The vehicle speed computed from the vehicle speed signal sent from TCM or combination meter is displayed. 	
IDL A/V LEARN [YET/CMPLT]			 Display the condition of idle air volume learning YET: Idle air volume learning has not been per- formed yet. CMPLT: Idle air volume learning has already been performed successfully. 	
TRVL AFTER MIL [km] or [mile]			Distance traveled while MIL is activated.	
O2SEN HTR DTY [%]			 Indicates the heated oxygen sensor 1 heater control value computed by the ECM according to the input signals. 	
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 combination meter is displayed.	
SET VHCL SPD [km/h] or [mph]			The preset vehicle speed is displayed.	
MAIN SW [ON/OFF]			Indicates [ON/OFF] condition from CRUISE switch signal.	
CANCEL SW [ON/OFF]			Indicates [ON/OFF] condition from CANCEL switch signal.	

[TYPE 2]

Monitored item [Unit]	ECM INPUT SIG- NALS	MAIN SIG- NALS	Description	Remarks	А
RESUME/ACC SW [ON/OFF]			Indicates [ON/OFF] condition from ACCEL/RES switch signal.		EC
SET SW [ON/OFF]			Indicates [ON/OFF] condition from COAST/SET switch signal.		С
BRAKE SW1 [ON/OFF]			 Indicates [ON/OFF] condition from ASCD brake switch signal, and ASCD clutch switch signal (M/T models). 		D
BRAKE SW2 [ON/OFF]			Indicates [ON/OFF] condition of stop lamp switch signal.		D
VHCL SPD CUT			 Indicates the vehicle cruise condition. NON: Vehicle speed is maintained at the ASCD set speed. CUT: Vehicle speed increased to excessively 		Е
			high compared with the ASCD set speed, and ASCD operation is cut off.		F
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 compared with the ASCD set speed, and ASCD operation is cut off. 		G
AT OD MONITOR [ON/OFF]			 Indicates [ON/OFF] condition of A/T O/D according to the input signal from the TCM. 	For M/T models always "OFF" is displayed.	
AT OD CANCEL [ON/OFF]			Indicates [ON/OFF] condition of A/T O/D cancel signal sent from the TCM.	For M/T models always "OFF" is displayed.	l
CRUISE LAMP [ON/OFF]			 Indicates [ON/OFF] condition of CRUISE lamp determined by the ECM according to the input signals. 		J
SET LAMP [ON/OFF]			 Indicates [ON/OFF] condition of SET lamp determined by the ECM according to the input signals. 		K
Voltage [V]					
Frequency [msec], [Hz] or [%]				Only "#" is displayed if item is unable to be measured.	L
DUTY-HI			Voltage, frequency, duty cycle or pulse width	Figures with "#"s are temporary	
LO SPEED CUT [NON/CUT] AT OD MONITOR [ON/OFF] AT OD CANCEL [ON/OFF] CRUISE LAMP [ON/OFF] SET LAMP [ON/OFF] Voltage [V] Frequency [msec], [Hz] or [%] DUTY-HI DUTY-LOW			measured by the probe.	ones. They are the same figures as an actual piece of data which was	\mathbb{N}
PLS WIDTH-HI	VHCL SPD CUT [NON/CUT] LO SPEED CUT [NON/CUT] AT OD MONITOR [ON/OFF] AT OD CANCEL [ON/OFF] CRUISE LAMP [ON/OFF] SET LAMP [ON/OFF] Voltage [V] Frequency [msec], [Hz] or [%] DUTY-LOW			just previously measured.	
PLS WIDTH-LOW					

NOTE:

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

DATA MONITOR (SPEC) MODE Monitored Item

Monitored item [Unit]	ECM input signals	Main signals	Description	Remarks
ENG SPEED [rpm]	×	×	 Indicates the engine speed computed from the signal of the crankshaft position sensor (POS) and camshaft position sensor (PHASE). 	
MAS A/F SE-B1 [V]	×	×	The signal voltage of the mass air flow sensor specification is displayed.	When engine is running specification range is indicated.
B/FUEL SCHDL [msec]		×	 "Base fuel schedule" indicates the fuel injection pulse width programmed into ECM, prior to any learned on board cor- rection. 	When engine is running specification range is indicated.
A/F ALPHA-B1 [%] A/F ALPHA-B2 [%]		×	The mean value of the air-fuel ratio feed-back correction factor per cycle is indicated.	 When engine is running specification range is indicated. This data also includes the data for the air-fuel ratio learning control.

NOTE:

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

ACTIVE TEST MODE

Test Item

rest item			
TEST ITEM	CONDITION	JUDGEMENT	CHECK ITEM (REMEDY)
FUEL INJEC- TION	 Engine: Return to the original trouble condition Change the amount of fuel injection using CONSULT-II. 	If trouble symptom disappears, see CHECK ITEM.	Harness and connectorsFuel injectorsHeated oxygen sensor 1
IGNITION TIM- ING	 Engine: Return to the original trouble condition Timing light: Set Retard the ignition timing using CONSULT-II. 	If trouble symptom disappears, see CHECK ITEM.	Perform Idle Air Volume Learning.
POWER BAL- ANCE	 Engine: After warming up, idle the engine. A/C switch: OFF Shift lever: N Cut off each injector signal one at a time using CONSULT-II. 	Engine runs rough or dies.	 Harness and connectors Compression Fuel injectors Power transistor Spark plugs Ignition coils
COOLING FAN*	Ignition switch: ON Turn the cooling fan "HI", "LOW" and "OFF" using CONSULT-II.	Cooling fan moves and stops.	Harness and connectorsCooling fan motorIPDM E/R
ENG COOLANT TEMP	 Engine: Return to the original trouble condition Change the engine coolant temperature using CONSULT-II. 	If trouble symptom disappears, see CHECK ITEM.	Harness and connectorsEngine coolant temperature sensorFuel injectors
FUEL PUMP RELAY	 Ignition switch: ON (Engine stopped) Turn the fuel pump relay "ON" and "OFF" using CONSULT-II and listen to operating sound. 	Fuel pump relay makes the operating sound.	Harness and connectors Fuel pump relay

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			[= 2]					
TEST ITEM	CONDITION	JUDGEMENT	CHECK ITEM (REMEDY)					
PURG VOL	 Engine: After warming up, run engine at 1,500 rpm. Change the EVAP canister purge 	Engine speed changes according to	Harness and connectors	A				
CONT/V	volume control solenoid valve opening percent using CON-SULT-II.	the opening percent.	Solenoid valve	EC				
FUEL/T TEMP SEN	Change the fuel tank temperature	Change the fuel tank temperature using CONSULT-II.						
VENT CON- TROL/V	 Ignition switch: ON (Engine stopped) Turn solenoid valve "ON" and "OFF" with the CONSULT-II and listen to operating sound. 	Solenoid valve makes an operating sound.	Harness and connectors Solenoid valve	D				
V/T ASSIGN ANGLE	 Engine: Return to the original trouble condition Change intake valve timing using CONSULT-II. 	If trouble symptom disappears, see CHECK ITEM.	Harness and connectors Intake valve timing control solenoid valve	F				

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

DTC & SRT CONFIRMATION MODE SRT STATUS Mode

For details, refer to EC-702, "SYSTEM READINESS TEST (SRT) CODE".

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	Condition	Reference page
	PURGE FLOW P0441		EC-969
EVAP SYSTEM	EVAP SML LEAK P0442/P1442*		EC-974
EVAP STSTEM	EVAP V/S SML LEAK P0456/P1456*		EC-1023
	PURG VOL CN/V P1444		EC-1156
	HO2S1 (B1) P0133		EC-860
	HO2S1 (B1) P0134		EC-873
	HO2S1 (B1) P1143		EC-1082
U0261	HO2S1 (B1) P1144		EC-1088
HO2S1 (B2) P0153 HO2S1 (B2) P0154 HO2S1 (B2) P1163 HO2S1 (B2) P1164	HO2S1 (B2) P0153	Refer to corresponding trouble diagnosis for	EC-860
	HO2S1 (B2) P0154	DTC.	EC-873
	HO2S1 (B2) P1163		EC-1082
		EC-1088	
	HO2S2 (B1) P0139		EC-893
	HO2S2 (B1) P1146		EC-1095
H02S2	HO2S2 (B1) P1147		EC-1107
110232	HO2S2 (B2) P0159		EC-893
	HO2S2 (B2) P1166		EC-1095
	HO2S2 (B2) P1167		EC-1107

^{*:} DTC P1442 and P1456 does not apply to V35 models but appears in DTC Work Support Mode screens.

REAL TIME DIAGNOSIS IN DATA MONITOR MODE (RECORDING VEHICLE DATA) Description

CONSULT-II has two kinds of triggers and they can be selected by touching "SETTING" in "DATA MONITOR" mode.

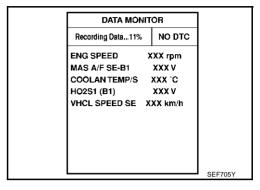
- 1. "AUTO TRIG" (Automatic trigger):
 - The malfunction will be identified on the CONSULT-II screen in real time.

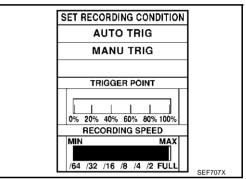
In other words, DTC/1st trip DTC and malfunction item will be displayed if the malfunction is detected by ECM.

At the moment a malfunction is detected by ECM, "MONITOR" in "DATA MONITOR" screen is changed to "Recording Data ... xx%" as shown at right, and the data after the malfunction detection is recorded. Then when the percentage reached 100%, "REAL-TIME DIAG" screen is displayed. If "STOP" is touched on the screen during "Recording Data ... xx%", "REAL-TIME DIAG" screen is also displayed.

The recording time after the malfunction detection and the recording speed can be changed by "TRIGGER POINT" and "Recording Speed". Refer to CONSULT-II OPERATION MANUAL.

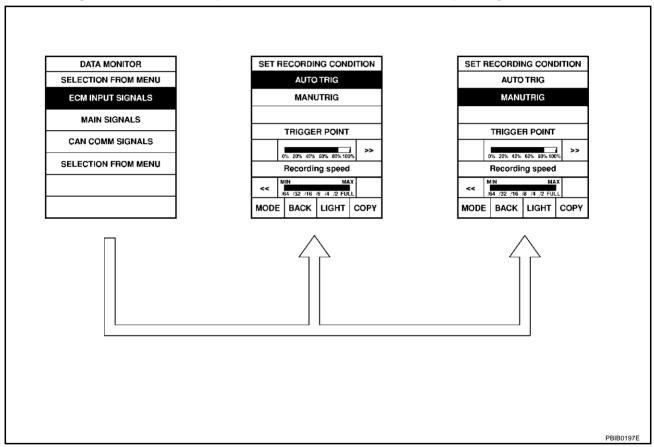
- 2. "MANU TRIG" (Manual trigger):
 - DTC/1st trip DTC and malfunction item will not be displayed automatically on CONSULT-II screen even though a malfunction is detected by ECM.
 - DATA MONITOR can be performed continuously even though a malfunction is detected.





Operation

- 1. "AUTO TRIG"
 - While trying to detect the DTC/1st trip DTC by performing the DTC Confirmation Procedure, be sure to select to "DATA MONITOR (AUTO TRIG)" mode. You can confirm the malfunction at the moment it is detected.
 - While narrowing down the possible causes, CONSULT-II should be set in "DATA MONITOR (AUTO TRIG)" mode, especially in case the incident is intermittent.
 When you are inspecting the circuit by gently shaking (or twisting) the suspicious connectors, components and harness in the DTC Confirmation Procedure, the moment a malfunction is found the DTC/1st trip DTC will be displayed. (Refer to INCIDENT SIMULATION TESTS in GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".)
- 2. "MANU TRIG"
 - If the malfunction is displayed as soon as "DATA MONITOR" is selected, reset CONSULT-II to "MANU TRIG". By selecting "MANU TRIG" you can monitor and store the data. The data can be utilized for further diagnosis, such as a comparison with the value for the normal operating condition.

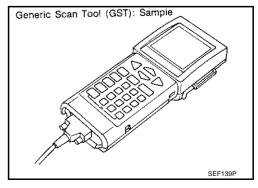


Generic Scan Tool (GST) Function DESCRIPTION

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

ISO9141 is used as the protocol.

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



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D	iagnostic test mode	Function
MODE 1	READINESS TESTS	This mode gains access to current emission-related data values, including analog inputs and outputs, digital inputs and outputs, and system status information.
MODE 2	(FREEZE DATA)	This mode gains access to emission-related data value which were stored by ECM during the freeze frame. For details, refer to EC-701, "FREEZE FRAME DATA AND 1ST TRIP FREEZE FRAME DATA".
MODE 3	DTCs	This mode gains access to emission-related power train trouble codes which were stored by ECM.
		This mode can clear all emission-related diagnostic information. This includes:
		Clear number of diagnostic trouble codes (MODE 1)
		Clear diagnostic trouble codes (MODE 3)
MODE 4	CLEAR DIAG INFO	Clear trouble code for freeze frame data (MODE 1)
		Clear freeze frame data (MODE 2)
		 Reset status of system monitoring test (MODE 1)
		 Clear on board monitoring test results (MODE 6 and 7)
MODE 6	(ON BOARD TESTS)	This mode accesses the results of on board diagnostic monitoring tests of specific components/systems that are not continuously monitored.
MODE 7	(ON BOARD TESTS)	This mode enables the off board test drive to obtain test results for emission-related powertrain components/systems that are continuously monitored during normal driving conditions.
		This mode can close EVAP system in ignition switch ON position (Engine stopped). When this mode is performed, the following parts can be opened or closed.
		EVAP canister vent control valve open
		In the following conditions, this mode cannot function.
		Low ambient temperature
MODE 8	_	Low battery voltage
		Engine running

• Too much pressure is applied to EVAP system

as Vehicle Identification Number (VIN) and Calibration IDs.

This mode enables the off-board test device to request specific vehicle information such

INSPECTION PROCEDURE

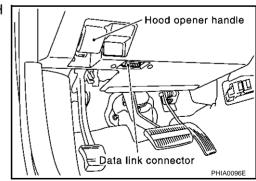
(CALIBRATION ID)

1. Turn ignition switch OFF.

MODE 9

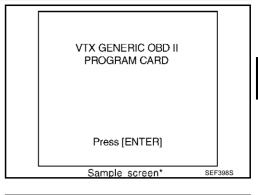
2. Connect "GST" to data link connector, which is located under LH dash panel near the hood opener handle.

Ignition switch OFF Low fuel temperature



[TYPE 2]

- 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.)



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*

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CONSULT-II Reference Value in Data Monitor

Remarks:

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 sensor and other ignition timing related sensors.

MONITOR ITEM		sor and other ignition timing related sens IDITION	SPECIFICATION
ENG SPEED	Run engine and compare CONSU tion.	LT-II value with the tachometer indica-	Almost the same speed as the tachometer indication.
	Engine: After warming up	Idle	Approx. 1.1 - 1.5V
 MAS A/F SE-B1 Air conditioner switch: OFF Shift lever: N (A/T), Neutral (M/T) No-load 		2,500 rpm	Approx. 1.6 - 2.4V
	Engine: After warming up	Idle	2.5 - 3.5 msec
B/FUEL SCHDL	 Shift lever: N (A/T), Neutral (M/T) Air conditioner switch: OFF No-load 	2,000 rpm	2.5 - 3.5 msec
A/F ALPHA-B1 A/F ALPHA-B2	Engine: After warming up	Maintaining engine speed at 2,000 rpm	54% - 155%
COOLAN TEMP/S	Engine: After warming up		More than 70°C (158°F)
HO2S1 (B1) HO2S1 (B2)	Engine: After warming up	Maintaining engine speed at 2,000 rpm	0 - 0.3V ←→ Approx. 0.6 - 1.0V
-	Warm-up condition		
HO2S2 (B1) HO2S2 (B2)	 After keeping engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load. 	Revving engine from idle to 3,000 rpm quickly.	0 - 0.3V ←→ Approx. 0.6 - 1.0V
HO2S1 MNTR (B1) HO2S1 MNTR (B2)	Engine: After warming up	Maintaining engine speed at 2,000 rpm	LEAN ←→ RICH Changes more than 5 times during 10 seconds.
	Warm-up condition		
HO2S2 MNTR (B1) HO2S2 MNTR (B2)	 After keeping engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load. 	Revving engine from idle to 3,000 rpm quickly.	LEAN ←→ RICH
VHCL SPEED SE	Turn drive wheels and compare C indication.	ONSULT-II value with the speedometer	Almost the same speed as the speedometer indication
BATTERY VOLT	Ignition switch: ON (Engine stopped)	ed)	11 - 14V
ACCEL SEN1	Ignition switch: ON	Accelerator pedal: Fully released	0.5 - 1.0V
ACCEL SENT	(Engine stopped)	Accelerator pedal: Fully depressed	4.0 - 4.7V
ACCEL SEN2*	Ignition switch: ON	Accelerator pedal: Fully released	0.3 - 1.2V
	(Engine stopped)	Accelerator pedal: Fully depressed	3.9 - 4.8V
THRTL SEN1	 Ignition switch: ON (Engine stopped) 	Accelerator pedal: Fully released	More than 0.36V
THRTL SEN2*	● Shift lever: D (A/T), 1st (M/T)	Accelerator pedal: Fully depressed	Less than 4.75V
EVAP SYS PRES	Ignition switch: ON		Approx. 1.8 - 4.8V
START SIGNAL	• Ignition switch: ON \rightarrow START \rightarrow 0	ON	$OFF \to ON \to OFF$
CLSD THL POS	Ignition switch: ON	Accelerator pedal: Fully released	ON
	(Engine stopped)	Accelerator pedal: Slightly depressed	OFF

[TYPE 2]

MONITOR ITEM	CONDITION		SPECIFICATION	_
		Air conditioner switch: OFF	OFF	– A
AIR COND SIG	Engine: After warming up, idle the engine	Air conditioner switch: ON (Compressor operates.)	ON	EC
P/N POSI SW	• Ignition quitable ON	Shift lever: P or N (A/T), Neutral (M/T)	ON	
P/N POSI SW • Ignition switch: ON		Shift lever: Except above	OFF	
PW/ST SIGNAL	Engine: After warming up, idle the engine	Steering wheel is in neutral position. (Forward direction)	OFF	С
	the engine	Steering wheel is turned.	ON	
LOAD SIGNAL	Ignition switch: ON	Rear window defogger switch is ON and/or lighting switch is in 2nd.	ON	D
LOAD SIGNAL	• Igrittori switcii. Oiv	Rear window defogger switch is OFF and lighting switch is OFF.	OFF	E
IGNITION SW	• Ignition switch: $ON \to OFF \to ON$		$ON \to OFF \to ON$	
HEATER FAN SW	Engine: After warming up, idle	Heater fan is operating.	ON	
HEALEN LAN SW	the engine	Heater fan is not operating	OFF	F
BRAKE SW	▲ Ignition switch: ON	Brake pedal: Fully released	OFF	_
DRANE SW	Ignition switch: ON	Brake pedal: Slightly depressed	ON	G
	Engine: After warming up	Idle	2.0 - 3.0 msec	
INJ PULSE-B2 • Air conditioner	 Shift lever: N (A/T), Neutral (M/T) Air conditioner switch: OFF No-load 	2,000 rpm	1.9 - 2.9 msec	Н
		Idle	13° - 18° BTDC	
IGN TIMING	 Engine: After warming up Shift lever: N (A/T), Neutral (M/T) Air conditioner switch: OFF No-load 	2,000 rpm	25° - 45° BTDC	- I
	Engine: After warming up	Idle	5% - 35%	_ J
CAL/LD VALUE	 Shift lever: N (A/T), Neutral (M/T) Air conditioner switch: OFF No-load 	2,500 rpm	5% - 35%	K
	Engine: After warming up	Idle	2.0 - 6.0 g·m/s	_
MASS AIRFLOW	 Shift lever: N (A/T), Neutral (M/T) Air conditioner switch: OFF No-load 	2,500 rpm	7.0 - 20.0 g·m/s	L
	Engine: After warming up	Idle	0%	M
PURG VOL C/V	 Shift lever: N (A/T), Neutral (M/T) Air conditioner switch: OFF No-load 	2,000 rpm	_	_
	Engine: After warming up	Idle	–5° - 5°CA	
INT/V TIM (B1) INT/V TIM (B2)	 Shift lever: N (A/T), Neutral (M/T) Air conditioner switch: OFF No-load 	When revving engine up to 2,000 rpm quickly	Approx. 0° - 30°CA	
	Engine: After warming up	Idle	0% - 2%	_
INT/V SOL (B1) INT/V SOL (B2)	 Shift lever: N (A/T), Neutral (M/T) Air conditioner switch: OFF No-load 	When revving engine up to 2,000 rpm quickly	Approx. 0% - 50%	_
	Engine: After warming up, idle	Air conditioner switch: OFF	OFF	_
AIR COND RLY	the engine	Air conditioner switch: ON (Compressor operates)	ON	

EC-771 2003 G35 Sedan Revision; 2004 April

	T	-	[TYPE 2]
MONITOR ITEM		NDITION	SPECIFICATION
	For 1 second after turning ignition switch ON		ON
FUEL PUMP RLY	Engine running or cranking		
VENT CONTA	Except above conditions		OFF
VENT CONT/V	Ignition switch: ON		OFF
THRTL RELAY	Ignition switch: ON		ON
		Engine coolant temperature is 94°C (201°F) or less	OFF
COOLING FAN	Engine: After warming up, idle the engineAir conditioner switch: OFF	Engine coolant temperature is between 95°C (203°F) and 99°C (210°F)	LOW
		Engine coolant temperature is 100°C (212°F) or more	н
	Engine: After warming up		ON
HO2S1 HTR (B1) HO2S1 HTR (B2)	• Engine speed: Below 3,600 rpm		ON
1102011111 (02)	• Engine speed: Above 3,600 rpm		OFF
	Engine speed is below 3,600 rpm	after the following conditions are met.	
HO2S2 HTR (B1) HO2S2 HTR (B2)	 Engine: After warming up Keeping the engine speed betwe at idle for 1 minute under no load 	en 3,500 and 4,000 rpm for 1 minute and	ON
	• Engine speed: Above 3,600 rpm		OFF
I/P PULLY SPD	Vehicle speed: More than 20 km/h (12MPH)		Almost the same speed as the tachometer indication
VEHICLE SPEED	Turn drive wheels and compare CONSULT-II value with the speedometer indication.		Almost the same speed as the speedometer indication
TRVL AFTER MIL	Idultion Switch: ()[v]		0 - 65,535 km (0 - 40,723 mile)
O2SEN HTR DTY	 Engine coolant temperature when engine started: More than 80°C (176°F) Engine speed: Below 3,600 rpm 		Approx. 40%
	Ignition switch: ON (Engine stopp)	ped)	Approx. 0V
AC PRESS SEN	• Engine: Idle		
	Air conditioner switch: OFF		1.0 - 4.0V
VHCL SPEED SE	Turn drive wheels and compare 0 indication.	CONSULT-II value with the speedometer	Almost the same speed as the speedometer indication
SET VHCL SPD	Engine: Running	ASCD: Operating.	The preset vehicle speed is displayed.
		CRUISE switch: Pressed	ON
MAIN SW	Ignition switch: ON	CRUISE switch: Released	OFF
		CANCEL switch: Pressed	ON
CANCEL SW	Ignition switch: ON	CANCEL switch: Released	OFF
DE0111211212	1 10 10 10 10 10 10 10 10 10 10 10 10 10	ACCEL/RES switch: Pressed	ON
RESUME/ACC SW	Ignition switch: ON	ACCEL/RES switch: Released	OFF
		COAST/SET switch: Pressed	ON
SET SW	Ignition switch: ON	COAST/SET switch: Released	OFF
		Clutch pedal (M/T) and brake pedal: Fully released	ON
BRAKE SW1	Ignition switch: ON	Clutch pedal (M/T) and/or brake pedal: Slightly depressed	OFF
		Brake pedal: Fully released	OFF
BRAKE SW2	 Ignition switch: ON 	Brake pedal: Slightly depressed	

[TYPE 2]

MONITOR ITEM	CONDITION		SPECIFICATION
CRUISE LAMP	Ignition quitab: ONI	CRUISE lamp: Illuminated ON	
	Ignition switch: ON	CRUISE lamp: Not illuminated	OFF
SET LAMP	Ignition switch: ON	SET lamp: Illuminated	ON
		SET lamp: Not illuminated	OFF

^{*:} 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.

Major Sensor Reference Graph in Data Monitor Mode

ABS00819

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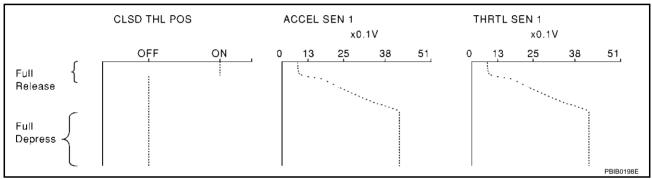
Е

The following are the major sensor reference graphs in "DATA MONITOR" mode.

CLSD THL POS, ACCEL SEN 1, THRTL SEN 1

Below is the data for "CLSD THL POS", "ACCEL SEN 1" and "THRTL SEN 1" when depressing the accelerator pedal with the ignition switch ON and with shift lever in D (A/T), 1st (M/T) position.

The signal of "ACCEL SEN 1" and "THRTL SEN 1" should rise gradually without any intermittent drop or rise after "CLSD THL POS" is changed from "ON" to "OFF".



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EC-773

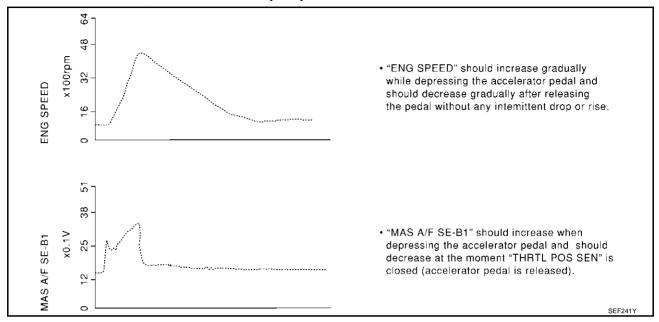
Revision; 2004 April

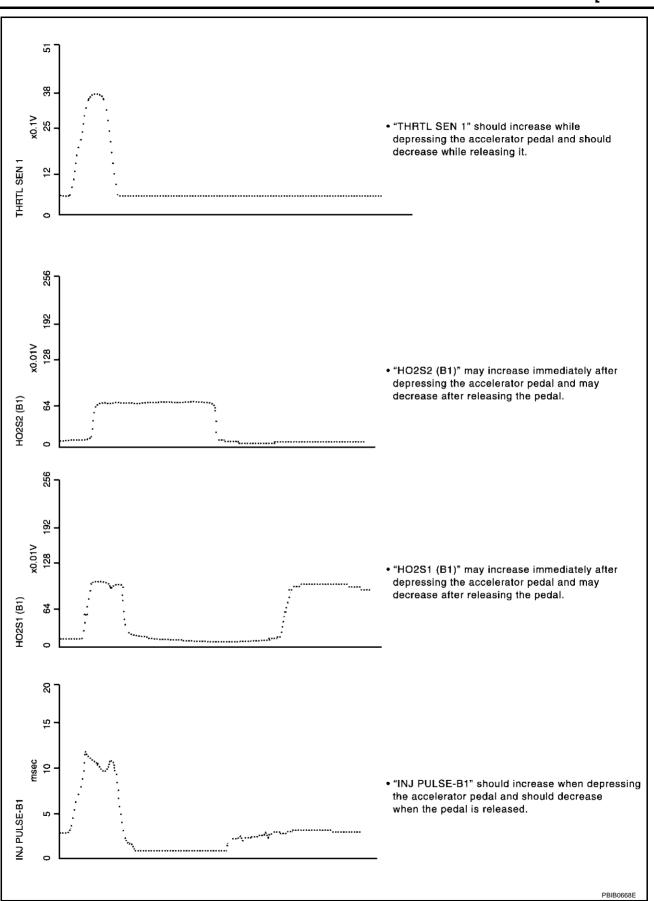
2003 G35 Sedan

ENG SPEED, MAS A/F SE-B1, THRTL SEN 1, HO2S2 (B1), HO2S1 (B1), INJ PULSE-B1

Below is the data for "ENG SPEED", "MAS A/F SE-B1", "THRTL SEN 1", "HO2S2 (B1)", "HO2S1 (B1)" and "INJ PULSE-B1" when revving engine quickly up to 4,800 rpm under no load after warming up engine sufficiently.

Each value is for reference, the exact value may vary.





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TROUBLE DIAGNOSIS - SPECIFICATION VALUE

[TYPE 2]

TROUBLE DIAGNOSIS - SPECIFICATION VALUE

PFP:00031

DescriptionABS0081A

The specification (SP) value indicates the tolerance of the value that is displayed in "DATA MONITOR (SPEC)" mode of CONSULT-II during normal operation of the Engine Control System. When the value in "DATA MONITOR (SPEC)" mode is within the SP value, the Engine Control System is confirmed OK. When the value in "DATA MONITOR (SPEC)" 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 light 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 (The signal voltage of the mass air flow sensor)

Testing Condition

ARSONR1R

- Vehicle driven distance: More than 5,000 km (3,017 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*1
- Electrical load: Not applied*²
- Engine speed: Idle

*1: For A/T models, after the engine is warmed up to normal operating temperature, drive vehicle until "FLUID TEMP SE" (A/T fluid temperature sensor signal) indicates more than 60°C (140°F).

For M/T models, after the engine is warmed up to normal operating temperature, drive vehicle for 5 minutes.

*2: Rear window defogger switch, air conditioner switch, lighting switch are OFF. Steering wheel is straight ahead.

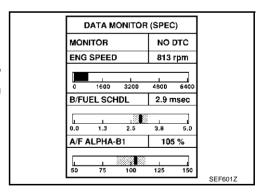
Inspection Procedure

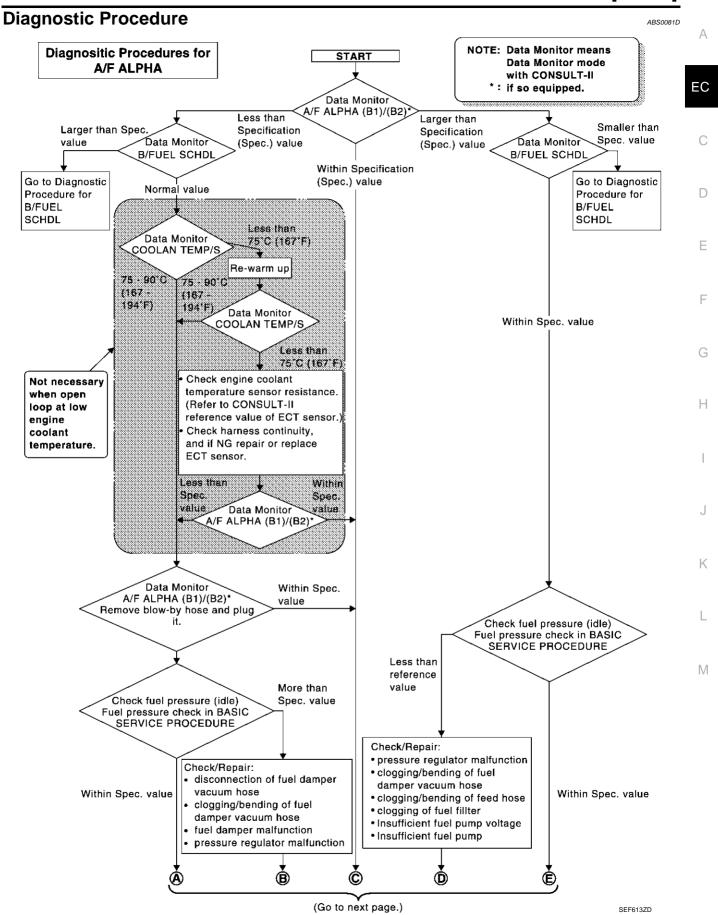
ABS0081C

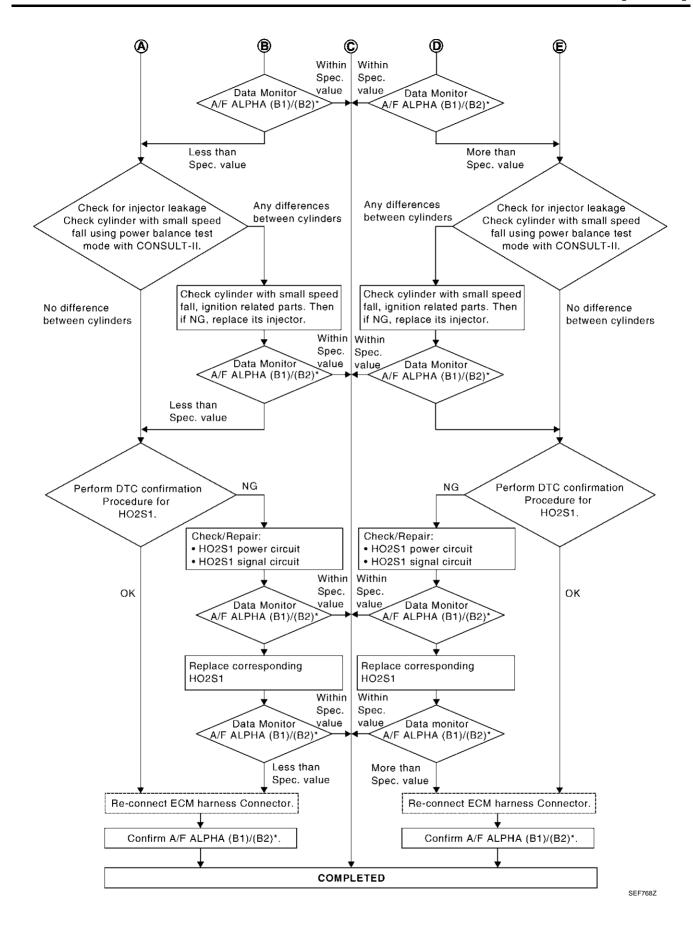
NOTE:

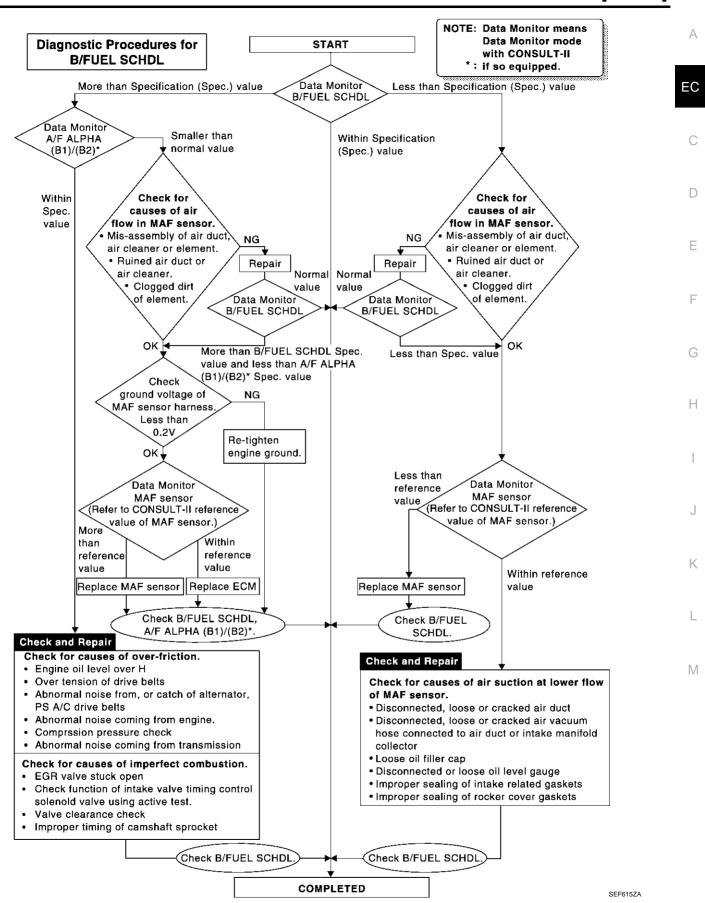
Perform "DATA MONITOR (SPEC)" mode in maximum scale display.

- 1. Perform EC-727, "Basic Inspection".
- Confirm that the testing conditions indicated above are met.
- Select "B/FUEL SCHDL", "A/F ALPHA-B1", "A/F ALPHA-B2" and "MAS A/F SE-B1" in "DATA MONITOR (SPEC)" mode with CONSULT-II.
- 4. Make sure that monitor items are within the SP value.
- 5. If NG, go to EC-777, "Diagnostic Procedure".









TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT

[TYPE 2]

TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT

PFP:00006

Description

ABS0081E

Intermittent incidents (I/I) may occur. In many cases, the malfunction resolves itself (the part or circuit function returns to normal without intervention). It is important to realize that the symptoms described in the customer's complaint often do not recur on (1st trip) DTC visits. Realize also that the most frequent cause of I/I occurrences is poor electrical connections. Because of this, the conditions under which the incident occurred may not be clear. Therefore, circuit checks made as part of the standard diagnostic procedure may not indicate the specific malfunctioning area.

Common I/I Report Situations

STEP in Work Flow	Situation
II	The CONSULT-II is used. The SELF-DIAG RESULTS screen shows time data other than [0] or [1t].
III	The symptom described by the customer does not recur.
IV	(1st trip) DTC does not appear during the DTC Confirmation Procedure.
VI	The Diagnostic Procedure for PXXXX does not indicate the malfunctioning area.

Diagnostic Procedure

ABS0081F

1. INSPECTION START

Erase (1st trip) DTCs. Refer to <u>EC-710, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION"</u>.

>> GO TO 2.

2. CHECK GROUND TERMINALS

Check ground terminals for corroding or loose connection.

Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident", "CIRCUIT INSPECTION", "Ground Inspection".

OK or NG

OK >> GO TO 3.

NG >> Repair or replace.

3. SEARCH FOR ELECTRICAL INCIDENT

Perform GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident", "INCIDENT SIMULATION TESTS".

OK or NG

OK >> GO TO 4.

NG >> Repair or replace.

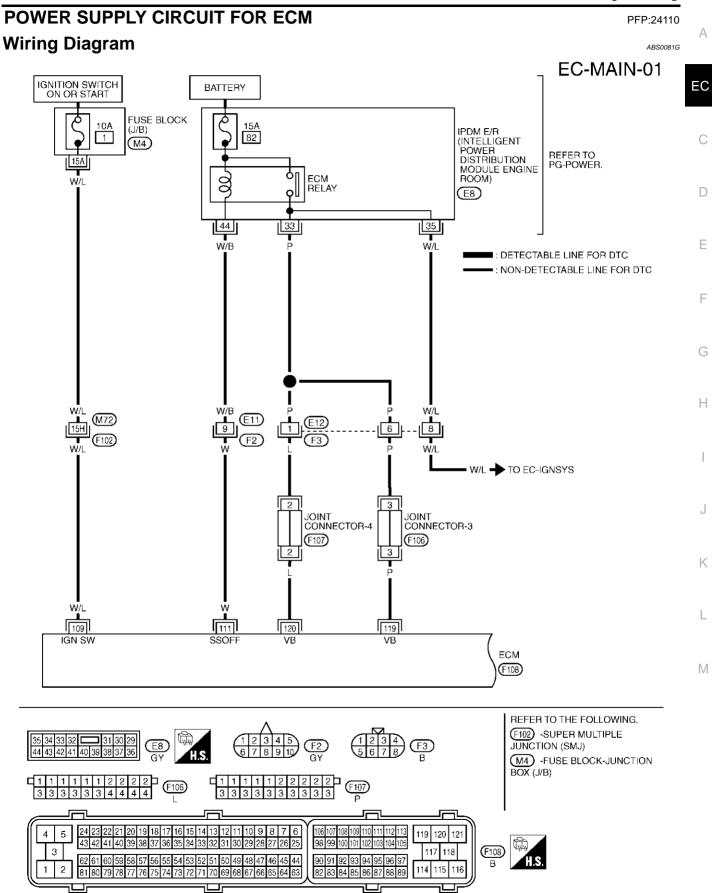
4. CHECK CONNECTOR TERMINALS

Refer to GI-23, "How to Check Terminal", "HOW TO PROBE CONNECTORS", "How to Check Enlarged Contact Spring of Terminal".

OK or NG

OK >> INSPECTION END

NG >> Repair or replace connector.



TBWT0410E

POWER SUPPLY CIRCUIT FOR ECM

[TYPE 2]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
			[Ignition switch: OFF]	OV
109	W/L	Ignition switch	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14V)
	111 W	ECM relay	[Engine is running] [Ignition switch: OFF]	0 - 1.5V
111			 For a few seconds after turning ignition switch OFF 	0 - 1.50
		(Self shut-off)	[Ignition switch: OFF]	DATTEDY VOLTAGE
			A few seconds passed after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
119 120	P L	Power supply for ECM	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14V)

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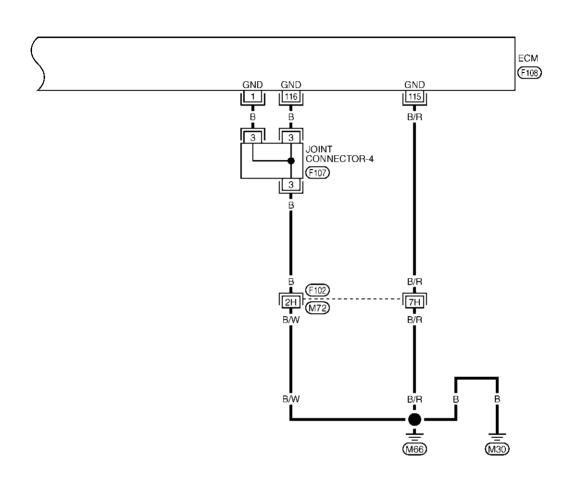
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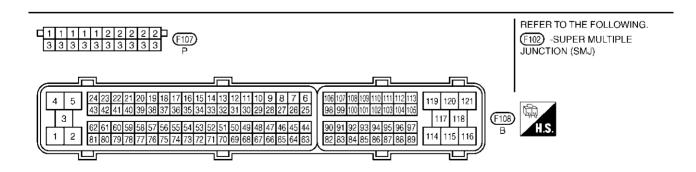
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EC-MAIN-02

: DETECTABLE LINE FOR DTC

: NON-DETECTABLE LINE FOR DTC





TBWT0254E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
1	В	ECM ground	[Engine is running] ● Idle speed	Engine ground
115 116	B/R B	ECM ground	[Engine is running] • Idle speed	Engine ground

Diagnostic Procedure

ABS0081H

1. INSPECTION START

Start engine.

Is engine running?

Yes or No

Yes >> GO TO 7. No >> GO TO 2.

2. CHECK ECM POWER SUPPLY CIRCUIT-I

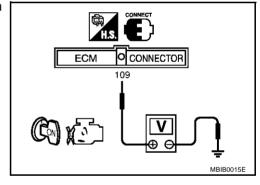
1. Turn ignition switch OFF and then ON.

2. Check voltage between ECM terminal 109 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 4. NG >> GO TO 3.



3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M72, F102
- Fuse block (J/B) connector M4
- 10A fuse
- Harness for open or short between ECM and fuse

>> Repair harness or connectors.

4. CHECK ECM GROUND CIRCUIT FOR OPEN AND SHORT-I

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check harness continuity between ECM terminals 1, 115, 116 and ground. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to power.

OK or NG

OK >> GO TO 6. NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-4
- Harness connectors F102, M72
- Harness for open or short between ECM and ground
 - >> Repair open circuit or short to power in harness or connectors.

6. CHECK ECM POWER SUPPLY CIRCUIT-II

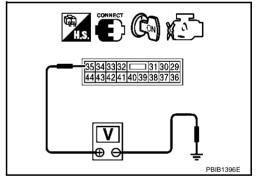
- 1. Reconnect ECM harness connector.
- 2. Turn ignition switch ON.
- 3. Check voltage between IPDM E/R terminal 35 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> Go to EC-1241, "IGNITION SIGNAL".

NG >> GO TO 7.



7. CHECK ECM POWER SUPPLY CIRCUIT-III

- 1. Turn ignition switch ON and then OFF.
- 2. Check voltage between ECM terminals 119, 120 and ground with CONSULT-II or tester.

Voltage: After turning ignition switch "OFF", battery voltage will exist for a few seconds, then

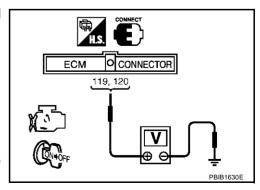
drop approximately 0V.

OK or NG

OK >> GO TO 16.

NG (Battery voltage does not exist.)>>GO TO 8.

NG (Battery voltage exists for more than a few seconds.)>>GO TO 16.



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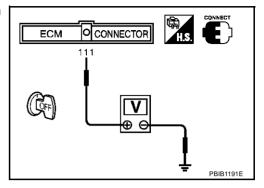
8. CHECK ECM POWER SUPPLY CIRCUIT-V

- 1. Turn ignition switch OFF.
- Check voltage between ECM terminal 111 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 9. NG >> GO TO 11.



9. CHECK ECM POWER SUPPLY CIRCUIT-VI

- 1. Disconnect ECM harness connector.
- 2. Disconnect IPDM E/R harness connector E8.
- 3. Check harness continuity between ECM terminals 119, 120 and IPDM E/R terminal 33. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 14. NG >> GO TO 10.

10. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-3
- Joint connector-4
- Harness or connectors E12, F3
- Harness for open or short between ECM and IPDM E/R

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

11. CHECK ECM POWER SUPPLY CIRCUIT-VII

- 1. Disconnect ECM harness connector.
- Disconnect IPDM E/R harness connector.
- Check harness continuity between ECM terminal 111 and IPDM E/R terminal 44. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 13. NG >> GO TO 12.

POWER SUPPLY CIRCUIT FOR ECM

[TYPE 2]

12. DETECT MALFUNCTIONING PART	Δ
Check the following.	
Harness or connectors E11, F2	EC
 Harness for open or short between ECM and IPDM E/R 	LO
>> Repair open circuit or short to ground or short to power in harness or connectors.	С
13. CHECK 15A FUSE	
Disconnect 15A fuse from IPDM E/R.	D
2. Check 15A fuse.	
OK or NG	Е
OK >> GO TO 16. NG >> Replace 15A fuse.	_
14. CHECK ECM GROUND CIRCUIT FOR OPEN AND SHORT-II	F
1. Turn ignition switch OFF.	
2. Disconnect ECM harness connector.	G
Check harness continuity between ECM terminals 1, 115, 116 and ground. Refer to Wiring Diagram.	
Continuity should exist.	Н
4. Also check harness for short to power.	
OK or NG	1
OK >> GO TO 16. NG >> GO TO 15.	
15. detect malfunctioning part	J
Check the following.	
Joint connector-4	K
Harness or connectors F102, M72 Harness for open or short between FCM and ground	
Harness for open or short between ECM and ground	L
>> Repair open circuit or short to power in harness connectors.	_
16. CHECK INTERMITTENT INCIDENT	M
Pofor to EC 700 "TDOUBLE DIACNOSIS FOR INTERMITTENT INCIDENT"	

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

OK or NG

OK >> Replace IPDM E/R. Refer to PG-16.

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

DTC U1000, U1001 CAN COMMUNICATION LINE

[TYPE 2]

DTC U1000, U1001 CAN COMMUNICATION LINE

PFP:23710

DescriptionABS00811

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.

On Board Diagnosis Logic

ABS0081.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
U1000* ¹ 1000* ¹ U1001* ² 1001* ²	CAN communication line	 ECM cannot communicate to other control units. ECM cannot communicate for more than the specified time. 	Harness or connectors (CAN communication line is open or shorted)

^{*1:} This self-diagnosis has the one trip detection logic.

DTC Confirmation Procedure

ABS0081K

- Turn ignition switch ON and wait at least 3 seconds.
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- 3. If 1st trip DTC is detected, go to EC-790, "Diagnostic Procedure".

^{*2:} The MIL will not light up for this diagnosis.

[TYPE 2]

Wiring Diagram

ABS0081L

EC-CAN-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC
: DATA LINE

TO LAN-CAN

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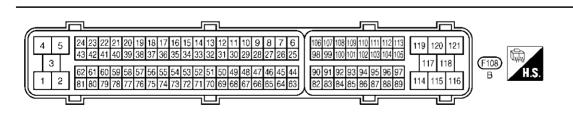
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ECM (F108)

DTC U1000, U1001 CAN COMMUNICATION LINE

[TYPE 2]

ABS0081M

Diagnostic Procedure

Go to LAN-4, "CAN Communication Unit"

[TYPE 2]

DTC P0011, P0021 IVT CONTROL

PFP:23796

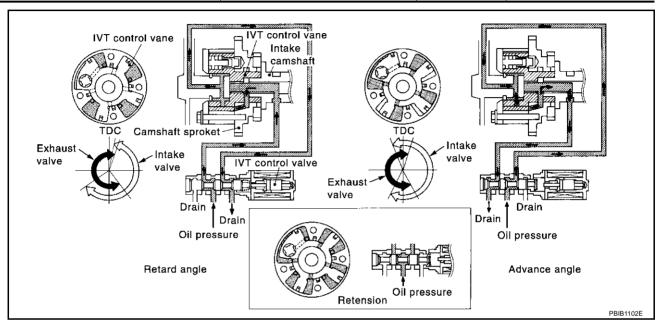
Description SYSTEM DESCRIPTION

ABS0081N

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Sensor	Input signal to ECM	ECM function	Actuator
Crankshaft position sensor (POS)	Engine speed	e speed	
Camshaft position sensor (PHASE)	Engine speed Intake valve Intake va		Intake valve timing control
Engine coolant temperature sensor	Engine coolant temperature	timing control solenoid valve	solenoid valve
Wheel sensor	Vehicle speed		



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.

CONSULT-II Reference Value in Data Monitor Mode

ABS00810

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Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
	Engine: After warming up	Idle	–5° - 5°CA
INT/V TIM (B1) INT/V TIM (B2)	 Shift lever: N (A/T), Neutral (M/T) Air conditioner switch: OFF No-load 	When revving engine up to 2,000 rpm quickly	Approx. 0° - 30°CA
	Engine: After warming up	Idle	0% - 2%
INT/V SOL (B2) • Air o	 Shift lever: N (A/T), Neutral (M/T) Air conditioner switch: OFF No-load 	When revving engine up to 2,000 rpm quickly	Approx. 0% - 50%

On Board Diagnosis Logic

RS0081P

DTC No.	Trouble diagnosis name	Detecting condition	Possible cause
P0011 0011 (Bank 1)	Intake valve timing	There is a gap between angle of target and	 Crankshaft position sensor (POS) Camshaft position sensor (PHASE)
P0021 0021 (Bank 2)	control performance	phase-control angle degree.	Accumulation of debris to the signal pick-up portion of the camshaft

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode.

Detected items	Engine operating condition in fail-safe mode	
Intake valve timing control	The signal is not energized to the solenoid valve and the valve control does not function.	

DTC Confirmation Procedure

ABS0081Q

CAUTION:

Always drive at a safe speed.

NOTE:

- If DTC P0011 or P0021 is displayed with DTC P1111 or P1136, first perform trouble diagnosis for DTC P1111 or P1136. Refer to <u>EC-1057</u>.
- If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

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

(P) WITH CONSULT-II

- Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-II.
- 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.

VHCL SPEED SE	100 - 120 km/h (63 - 75 MPH)
ENG SPEED	2,000 - 4,000 rpm
COOLAN TEMP/S	60 - 120°C (140 - 248°F)
B/FUEL SCHDL	More than 7.26 msec
Selector lever	A/T models: D position M/T models: 5th position

ENG SPEED XXX rpm B/FUEL SCHDL XXX msec COOLAN TENP/S XXX "C VHCL SPEED SE XXX km/h INT/V TIM (B1) XXX "CA INT/V TIM (B2) XXX "CA INT/V SOL (B1) XXX %	DATA MOI	NITOR	
B/FUEL SCHDL XXX msec COOLAN TENP/S XXX 'C VHCL SPEED SE XXX km/h INT/V TIM (B1) XXX 'CA INT/V TIM (B2) XXX 'CA INT/V SOL (B1) XXX %	MONITOR	NO DTC	
COOLANTENP/S XXX °C VHCL SPEED SE XXX km/h INT/V TIM (B1) XXX °CA INT/V TIM (B2) XXX °CA INT/V SOL (B1) XXX %	ENG SPEED	XXX rpm	
VHCL SPEED SE XXX km/h INT/V TIM (B1) XXX 'CA INT/V TIM (B2) XXX 'CA INT/V SOL (B1) XXX %	B/FUEL SCHDL	XXX msec	
INT/V TIM (B1) XXX *CA INT/V TIM (B2) XXX *CA INT/V SOL (B1) XXX %	COOLAN TENP/S	XXX °C	
INT/V TIM (B2) XXX "CA INT/V SOL (B1) XXX %	VHCL SPEED SE	XXX km/h	
INT/V SOL (B1) XXX %	INT/V TIM (B1)	XXX °CA	
. ,	INT/V TIM (B2)	XXX "CA	
INT/V SOL (B2) XXX %	INT/V SOL (B1)	XXX %	
	INT/V SOL (B2)	XXX %	
			SEF3532

- 4. Stop vehicle with engine running and let engine idle for 10 seconds.
- 5. If 1st trip DTC is detected, go to <u>EC-793, "Diagnostic Procedure"</u>. If 1st trip DTC is not detected, go to next step.
- 6. Maintain the following conditions for at least 20 consecutive seconds.

ENG SPEED	1,700 - 3,175 rpm (A constant rotation is maintained.)
COOLANT TEMPS	70 - 105°C (158 - 221°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.)

^{7.} If the 1st trip DTC is detected, go to EC-793, "Diagnostic Procedure".

DTC P0011, P0021 IVT CONTROL

[TYPE 2]

WITH GST

Follow the procedure "WITH CONSULT-II" above.

Diagnostic Procedure

ABS0081R

1. CHECK CRANKSHAFT POSITION SENSOR (POS)

Refer to EC-954, "Component Inspection".

OK or NG

OK >> GO TO 2.

NG >> Replace crankshaft position sensor (POS).

2. CHECK CAMSHAFT POSITION SENSOR (PHASE)

Refer to EC-963, "Component Inspection".

OK or NG

OK >> GO TO 3.

NG >> Replace camshaft position sensor (PHASE).

3. CHECK CAMSHAFT (INTAKE)

Check the following.

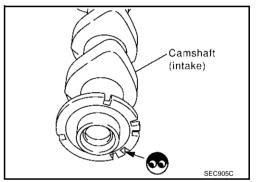
- Accumulation of debris to the signal plate of camshaft rear end
- Chipping signal plate of camshaft rear end

OK or NG

OK >> GO TO 4.

NG >> Remove

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



4. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

For wiring diagram, refer to EC-950 for CKP sensor (POS), EC-957 and EC-959 for CMP sensor (PHASE).

>> INSPECTION END

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Revision; 2004 April EC-793 2003 G35 Sedan

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DTC P0031, P0032, P0051, P0052 HO2S1 HEATER

[TYPE 2]

PFP:22690

DTC P0031, P0032, P0051, P0052 HO2S1 HEATER

Description SYSTEM DESCRIPTION

ABS0081S

Sensor	Input signal to ECM	ECM function	Actuator
Camshaft position sensor (PHASE) Crankshaft position sensor (POS)	Engine speed	Heated oxygen sensor 1	Heated oxygen sensor 1 heater
Engine coolant temperature sensor	Engine coolant temperature	heater control	Treated Oxygen Sensor Theater

The ECM performs ON/OFF control of the heated oxygen sensor 1 heater corresponding to the engine speed and engine coolant temperature. The duty percent varies with engine coolant temperature when engine is started.

OPERATION

Engine speed rpm	Heated oxygen sensor 1 heater	
Above 3,600	OFF	
Below 3,600 after warming up	ON	

CONSULT-II Reference Value in Data Monitor Mode

ABS0081T

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
HO2S1 HTR (B1) HO2S1 HTR (B2)	Engine: After warming upEngine speed: Below 3,600 rpm	ON
(52)	• Engine speed: Above 3,600 rpm	OFF

On Board Diagnosis Logic

ABS0081U

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	
P0031 0031 (Bank 1)	Heated oxygen	The current amperage in the heated oxygen sensor 1 heater circuit is out of the normal range.	Harness or connectors (The heated oxygen sensor 1 heater circuit is	
P0051 0051 (Bank 2)	control circuit low	(An excessively low voltage signal is sent to ECM through the heated oxygen sensor 1 heater.)	open or shorted.) • Heater oxygen sensor 1 heater	
P0032 0032 (Bank 1)	Heated oxygen	The current amperage in the heated oxygen sensor 1 heater circuit is out of the normal range.	Harness or connectors (The heated oxygen sensor 1 heater circuit is)	
P0052 0052 (Bank 2)	sensor 1 heater control circuit high	(An excessively high voltage signal is sent to ECM through the heated oxygen sensor 1 heater.)	shorted.) • Heater oxygen sensor 1 heater	

DTC P0031, P0032, P0051, P0052 HO2S1 HEATER

[TYPE 2]

DTC Confirmation Procedure

ABS0081V

NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

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

(P) WITH CONSULT-II

- 1. 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 and select "DATA MONITOR" mode with CONSULT-II.
- 4. Start engine and run it for at least 6 seconds at idle speed.
- 5. If 1st trip DTC is detected, go to EC-799, "Diagnostic Procedure"

DATA MONITOR

MONITOR NO DTC

ENG SPEED XXXX rpm

SEF058Y

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. Start engine and run it for at least 6 seconds at idle speed.
- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Start engine and run it for at least 6 seconds at idle speed.
- 6. Select "MODE 3" with GST.
- 7. If DTC is detected, go to EC-799, "Diagnostic Procedure".
- When using GST, DTC Confirmation Procedure should be performed twice as much as when using CONSULT-II because GST cannot display MODE 7 (1st trip DTC) concerning this diagnosis. Therefore, using CONSULT-II is recommended.

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Wiring Diagram BANK 1 ABS0081W IGNITION SWITCH ON OR START EC-O2H1B1-01 FUSE BLOCK (J/B) REFER TO PG-POWER. 15A 15 (M4)4H (M72) : DETECTABLE LINE FOR DTC : NON-DETECTABLE LINE FOR DTC R/B (F102) R/B HEATED OXYGEN SENSOR 1 (BANK 1) (F17) 3 W/B G/B R/Y B/Y JOINT CONNECTOR-4 (F107) B/Y W/B 35 78 24 GND-O2 O2HFR O2SFR ECM (F108) REFER TO THE FOLLOWING. (F102) -SUPER MULTIPLE JUNCTION (SMJ) M4) -FUSE BLOCK-JUNCTION BOX (J/B) 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 106 107 108 109 110 111 112 113 119 120 (F108) B 3 117 118 81 80 79 78 77 76 75 74 73 72 71 70 69 68 67 66 65 64 63 82 83 84 85 86 87 88 89

TBWT0258E

DTC P0031, P0032, P0051, P0052 HO2S1 HEATER

[TYPE 2]

Specification data are reference values and are measured between each terminal and ground. Pulse signal is measured by CONSULT-II.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
24	G/B	Heated oxygen sensor 1 heater (bank 1)	[Engine is running]Warm-up conditionEngine speed is below 3,600 rpm.	Approximately 8V★
			[Engine is running] • Engine speed is above 3,600 rpm.	BATTERY VOLTAGE (11 - 14V)

^{★:} Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

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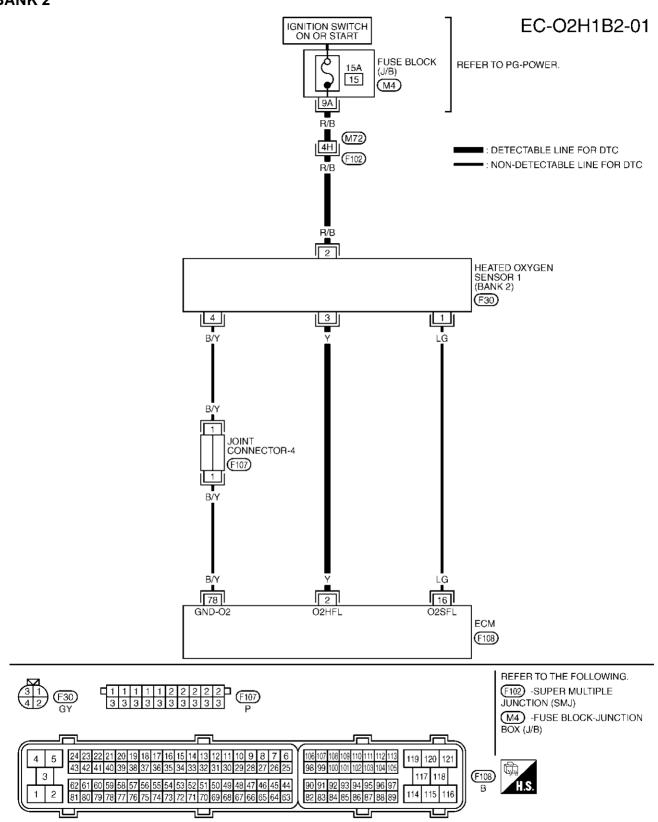
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BANK 2



TBWT0259E

DTC P0031, P0032, P0051, P0052 HO2S1 HEATER

[TYPE 2]

Specification data are reference values and are measured between each terminal and ground. Pulse signal is measured by CONSULT-II.

CAUTION:

Do not 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.

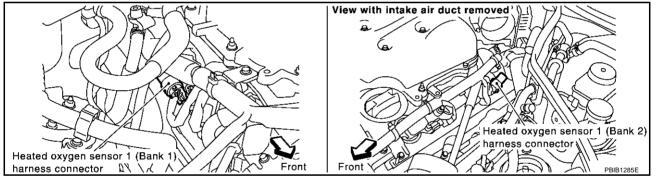
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
2	Y	Heated oxygen sensor 1 heater (bank 2)	[Engine is running]Warm-up conditionEngine speed is below 3,600 rpm.	Approximately 8V★
			[Engine is running] • Engine speed is above 3,600 rpm.	BATTERY VOLTAGE (11 - 14V)

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

1. CHECK HO2S1 POWER SUPPLY CIRCUIT

- Turn ignition switch OFF.
- 2. Disconnect heated oxygen sensor 1 harness connector.



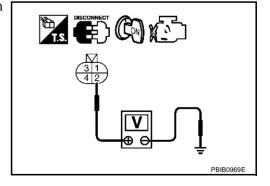
EC-799

- Turn ignition switch ON.
- 4. Check voltage between HO2S1 terminal 2 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 3. NG >> GO TO 2.



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ABS0081X

2003 G35 Sedan

[TYPE 2]

$\overline{2}$. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M72, F102
- Fuse block (J/B) connector M4
- 15A fuse
- Harness for open or short between heated oxygen sensor 1 and fuse
 - >> Repair harness or connectors.

3. CHECK HO2S1 OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- Disconnect ECM harness connector.
- Check harness continuity between ECM terminal and HO2S1 terminal as follows. Refer to Wiring Diagram.

DTC	Terminals		Bank
ыс	ECM	Sensor	Dank
P0031, P0032	24	3	1
P0051, P0052	2	3	2

Continuity should exist.

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

OK or NG

OK >> GO TO 4.

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

4. CHECK HEATED OXYGEN SENSOR 1 HEATER

Refer to EC-801, "Component Inspection".

OK or NG

OK >> GO TO 5.

NG >> Replace malfunctioning heated oxygen sensor 1.

5. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

[TYPE 2]

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Component Inspection HEATED OXYGEN SENSOR 1 HEATER

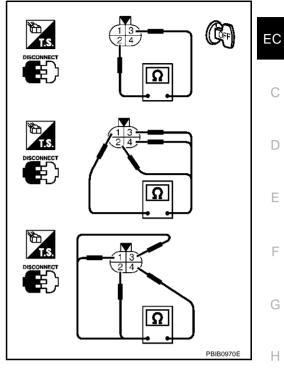
1. Check resistance between HO2S1 terminals as follows.

Terminal No.	Resistance
2 and 3	3.3 - 4.0 Ω at 25°C (77°F)
1 and 2, 3, 4	∞ Ω
4 and 1, 2, 3	(Continuity should not exist)

2. If NG, replace heated oxygen sensor 1.

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 tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.



Removal and Installation **HEATED OXYGEN SENSOR 1**

Refer to EM-24, "EXHAUST MANIFOLD AND THREE WAY CATALYST".

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DTC P0037, P0038, P0057, P0058 HO2S2 HEATER

[TYPE 2]

PFP:226A0

DTC P0037, P0038, P0057, P0058 HO2S2 HEATER

Description SYSTEM DESCRIPTION

ABS00820

Sensor	Input signal to ECM	ECM function	Actuator
Camshaft position sensor (PHASE)	Engine speed		
Crankshaft position sensor (POS)	Engine speed	Heated aware concer?	
Engine coolant temperature sensor	Engine coolant tempera- ture	Heated oxygen sensor 2 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 rpm	Heated oxygen sensor 2 heater
Above 3,600	OFF
Below 3,600 rpm after the following conditions are met.	
Engine: After warming up	ON
 Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load 	

CONSULT-II Reference Value in Data Monitor Mode

ABS00821

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
	• Engine speed is below 3,600 rpm after the following conditions are met.	
LICOCO LITE (D4)	- Engine: After warming up	ON
HO2S2 HTR (B1) HO2S2 HTR (B2)	 Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load 	
	Engine speed: Above 3,600 rpm	OFF

On Board Diagnosis Logic

ABS00822

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	
P0037 0037 (Bank 1)	Heated oxygen sensor 2 heater	The current amperage in the heated oxygen sensor 2 heater circuit is out of the normal range.	Harness or connectors (The heated oxygen sensor 2 heater circuit is)	
P0057 0057 (Bank 2)	control circuit low	(An excessively low voltage signal is sent to ECM through the heated oxygen sensor 2 heater.)	open or shorted.) • Heater oxygen sensor 2 heater	
P0038 0038 (Bank 1)	Heated oxygen	The current amperage in the heated oxygen sensor 2 heater circuit is out of the normal range.	Harness or connectors (The heated oxygen sensor 2 heater circuit is	
P0058 0058 (Bank 2)	control circuit high	trol circuit high ECM through the heated oxygen sensor 2	shorted.) • Heater oxygen sensor 2 heater	

DTC P0037, P0038, P0057, P0058 HO2S2 HEATER

[TYPE 2]

DTC Confirmation Procedure

ABS00823

NOTE:

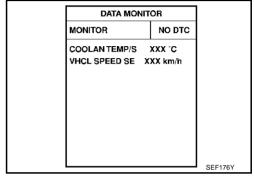
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

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

(P) WITH CONSULT-II

- Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-II.
- 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 the engine and keep the engine speed between 3,500 rpm and 4,000 rpm for at least 1 minute under no load.
- 5. Let engine idle for 1 minute.
- 6. If 1st trip DTC is detected, go to EC-807, "Diagnostic Procedure"



WITH GST

- Start engine and warm it up to the normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Start the engine and keep the engine speed between 3,500 rpm and 4,000 rpm for at least 1 minute under no load.
- 4. Let engine idle for 1 minute.
- Turn ignition switch OFF and wait at least 10 seconds.
- 6. Start the engine and keep the engine speed between 3,500 rpm and 4,000 rpm for at least 1 minute under no load.
- 7. Let engine idle for 1 minute.
- Select "MODE 3" with GST.
- 9. If DTC is detected, go to EC-807, "Diagnostic Procedure".

 When using GST, DTC Confirmation Procedure should be performed twice as much as when using CONSULT-II because GST cannot display MODE 7 (1st trip DTC) concerning this diagnosis. Therefore, using CONSULT-II is recommended.

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Wiring Diagram BANK 1 ABS00824 EC-O2H2B1-01 IGNITION SWITCH ON OR START FUSE BLOCK REFER TO PG-POWER. 15 (M4)4H R/B (M72) ■: DETECTABLE LINE FOR DTC : NON-DETECTABLE LINE FOR DTC R/B HEATED OXYGEN SENSOR 2 (BANK 1) (F11) 4 3 L/B P/B B/Y JOINT CONNECTOR-4 (F107) L/B 78 GND-02 O2HRR O2SRR ECM (F108) REFER TO THE FOLLOWING. (F102) -SUPER MULTIPLE JUNCTION (SMJ) M4) -FUSE BLOCK-JUNCTION BOX (J/B) 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 106 107 108 109 110 111 112 113 119 120 3 117 118 (F108) 81 80 79 78 77 76 75 74 73 72 71 70 69 68 67 66 65 64 63 82 83 84 85 86 87 88 89

TBWT0260E

DTC P0037, P0038, P0057, P0058 HO2S2 HEATER

[TYPE 2]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
			[Engine is running]	
			 Engine speed is 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. [Ignition switch: ON] 	
25	P/B	Heated oxygen sensor 2 heater (bank 1)		
			Engine stopped	BATTERY VOLTAGE
	[Engine is running]		[Engine is running]	(11 - 14V)
			 Engine speed is above 3,600 rpm. 	

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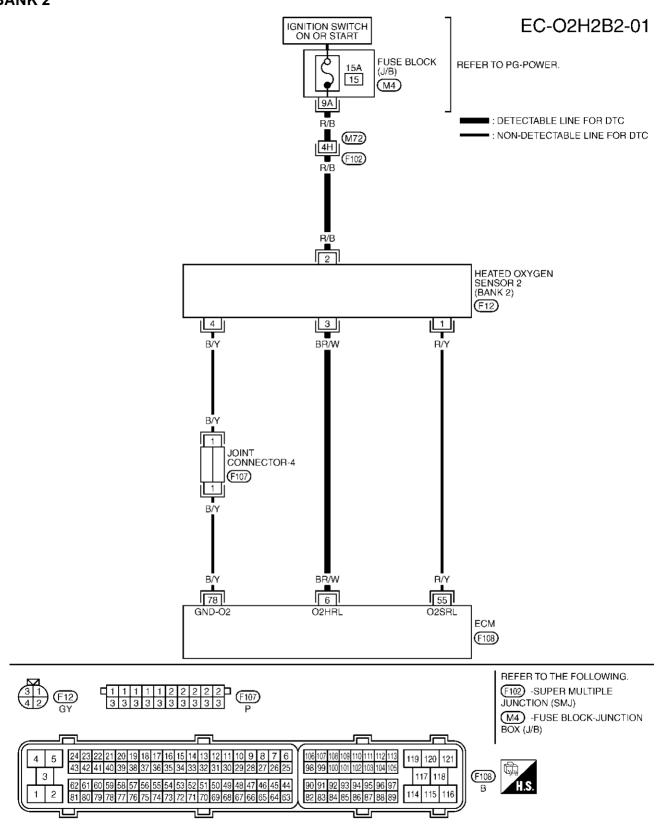
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DTC P0037, P0038, P0057, P0058 HO2S2 HEATER

[TYPE 2]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

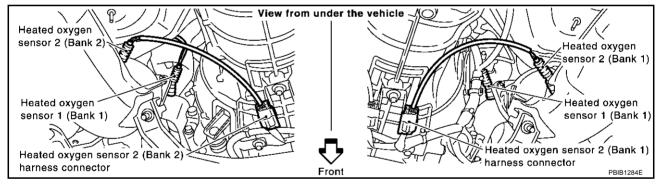
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)	EC
NO.			[Engine is running]		С
			 Engine speed is below 3,600 rpm after the following conditions are met. 		
			 Engine: after warming up 	0 - 1.0V	D
6	BR/W	Heated oxygen sensor 2 heater (bank 2)	 Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load. 		F
			[Ignition switch: ON]		_
			Engine stopped	BATTERY VOLTAGE	
			[Engine is running]	(11 - 14V)	F
			 Engine speed is above 3,600 rpm. 		

Diagnostic Procedure

1. CHECK HO2S2 POWER SUPPLY CIRCUIT

- Turn ignition switch OFF.
- 2. Disconnect heated oxygen sensor 2 harness connector.

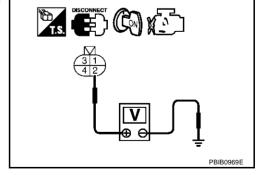


- 3. Turn ignition switch ON.
- Check voltage between HO2S2 terminal 2 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 3. NG >> GO TO 2.



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[TYPE 2]

$\overline{2}$. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M72, F102
- Fuse block (J/B) connector M4
- 15A fuse
- Harness for open or short between heated oxygen sensor 2 and fuse
 - >> Repair harness or connectors.

3. CHECK HO2S2 OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- Disconnect ECM harness connector.
- Check harness continuity between ECM terminal and HO2S2 terminal as follows. Refer to Wiring Diagram.

DTC	Tern	Bank	
DIC	ECM	Sensor	Dalik
P0037, P0038	25	3	1
P0057, P0058	6	3	2

Continuity should exist.

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

OK or NG

OK >> GO TO 4.

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

4. CHECK HEATED OXYGEN SENSOR 2 HEATER

Refer to EC-809, "Component Inspection".

OK or NG

OK >> GO TO 5.

NG >> Replace malfunctioning heated oxygen sensor 2.

5. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

DTC P0037, P0038, P0057, P0058 HO2S2 HEATER

[TYPE 2]

ABS00826

Component Inspection HEATED OXYGEN SENSOR 2 HEATER

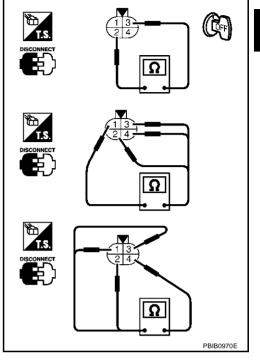
1. Check resistance between HO2S2 terminals as follows.

Terminal No.	Resistance
2 and 3	5.0 - 7.0 Ω at 25°C (77°F)
1 and 2, 3, 4	∞ Ω
4 and 1, 2, 3	(Continuity should not exist)

2. If NG, replace 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 tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.



Removal and Installation **HEATED OXYGEN SENSOR 2**

Refer to EM-24, "EXHAUST MANIFOLD AND THREE WAY CATALYST".

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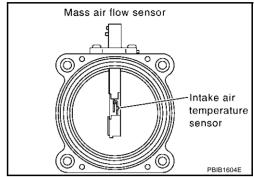
DTC P0101 MAF SENSOR

Component Description

PFP:22680

ABS00828

The mass air flow sensor is placed in the stream of intake air. It measures the intake flow rate by measuring a part of the entire intake flow. It consists of a hot film that is supplied with electric current from the ECM. The temperature of the hot film is controlled by the ECM a certain amount. The heat generated by the hot film is reduced as the intake air flows around it. The more air, the greater the heat loss. Therefore, the ECM must supply more electric current to maintain the temperature of the hot film as air flow increases. The ECM detects the air flow by means of this current change.



CONSULT-II Reference Value in Data Monitor Mode

ARSON820

Specification data are reference values.

MONITOR ITEM	CON	NDITION	SPECIFICATION
	Engine: After warming up	Idle	Approx. 1.1 - 1.5V
MAS A/F SE-B1	Air conditioner switch: OFF		
MAS AT SE-BT	• Shift lever: N (A/T), Neutral (M/T)	2,500 rpm	Approx. 1.6 - 2.4V
	No-load		
	Engine: After warming up	Idle	5% - 35%
CAL/LD VALUE	• Shift lever: N (A/T), Neutral (M/T)		
ONL/LD VALUE	Air conditioner switch: OFF	2,500 rpm	5% - 35%
	No-load		
	Engine: After warming up	Idle	2.0 - 6.0 g·m/s
MASS AIRFLOW	• Shift lever: N (A/T), Neutral (M/T)		
WAGO AIRT LOW	Air conditioner switch: OFF	2,500 rpm	7.0 - 20.0 g·m/s
	No-load		

On Board Diagnosis Logic

ABS0082A

This self-diagnosis has the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition		Possible cause	
	Mass air flow sensor cir-	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 	
P0101 0101	cuit range/performance problem	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 	

DTC Confirmation Procedure

ABS0082B

Perform PROCEDURE FOR MALFUNCTION A first.

If the DTC cannot be confirmed, perform PROCEDURE FOR MALFUNCTION B.

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

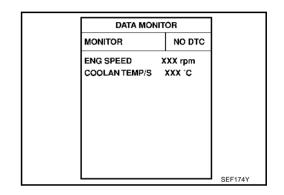
PROCEDURE FOR MALFUNCTION A

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.

With CONSULT-II

- 1. Turn ignition switch ON.
- Select "DATA MONITOR" mode with CONSULT-II.
- 3. Start engine and warm it up to normal operating temperature.
- Run engine for at least 10 seconds at idle speed.
- If DTC is detected, go to EC-814, "Diagnostic Procedure".



With GST

Follow the procedure "With CONSULT-II" above.

PROCEDURE FOR MALFUNCTION B

CAUTION:

Always drive vehicle at a safe speed.

(P) With CONSULT-II

Revision; 2004 April

- Turn ignition switch ON.
- Start engine and warm it up to normal operating temperature. If engine cannot be started, go to EC-814, "Diagnostic Procedure".
- Select "DATA MONITOR" mode with CONSULT-II.
- Check the voltage of "MAS A/F SE-B1" with "DATA MONITOR".
- Increases engine speed to about 4,000 rpm.
- Monitor the linear voltage rise in response to engine speed increases.

If NG, go to EC-814, "Diagnostic Procedure". If OK, go to following step.

OK MAS A/F SE-B1 MAS A/F SE-B1 x0.1V 25 x0.1V 25 12 12 38 51 0 51 SEF243Y

EC-811 2003 G35 Sedan

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Maintain the following conditions for at least 10 consecutive seconds.

ENG SPEED	More than 2,000 rpm
THRTL SEN 1	More than 3V
THRTL SEN 2	More than 3V
Selector lever	Suitable position
Driving location	Driving vehicle uphill (Increased engine load) will help maintain the driving conditions required for this test.

DATA MO	NITOR		
MONITOR	1	O DTC	
ENG SPEED VHCL SPEED SE THRTL SEN 1 THRTL SEN 2	XXX XX	rpm km/h X V X V	
			PBIB019

8. If DTC is detected, go to EC-814, "Diagnostic Procedure".

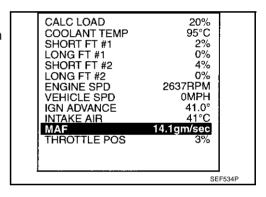
Overall Function Check PROCEDURE FOR MALFUNCTION B

ABS0082C

Use this procedure to check the overall function of the mass air flow sensor circuit. During this check, a 1st trip DTC might not be confirmed.

With GST

- 1. Start engine and warm it up to normal operating temperature.
- Select "MODE 1" with GST.
- 3. Check the mass air flow sensor signal with "MODE 1".
- 4. Check for linear mass air flow sensor signal value rise in response to increases to about 4,000 rpm in engine speed.
- 5. If NG, go to EC-814, "Diagnostic Procedure".



[TYPE 2]

Wiring Diagram Α EC-MAFS-01 BATTERY : DETECTABLE LINE FOR DTC EC : NON-DETECTABLE LINE FOR DTC 15A 82 IPDM E/R (INTELLIGENT POWER DISTRIBUTION REFER TO PG-POWER. С MODULE ENGINE ROOM) ECM RELAY (E8) 33 | D 44 Е 6 MASS AIR FLOW SENSOR G (F39) 3 B/W OR Н 3 3 JOINT CONNECTOR-4 JOINT CONNECTOR-3 (F107) (F106) 3 B/W B/W [111] 120 67 119 ECM (F108) M F2 GY 119 120 (F108) 90 91 92 93 94 95 96 97

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Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
51 OR		Mass air flow sensor	[Engine is running] • Warm-up condition • Idle speed	1.1 - 1.5V
			[Engine is running]Warm-up conditionEngine speed is 2,500 rpm.	1.7 - 2.4V
67	B/W	Sensors' ground (Mass air flow sensor / IAT sensor / Power steering pressure sensor / EVAP control system pressure sensor)	[Engine is running]Warm-up conditionIdle speed	Approximately 0V
111	W	ECM relay (Self shut-off)	[Engine is running] [Ignition switch: OFF] • For a few seconds after turning ignition switch OFF	0 - 1.5V
		(con state on)	[Ignition switch: OFF] • A few seconds passed after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
119 120	P L	Power supply for ECM	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

ABS0082E

1. INSPECTION START

Which malfunction (A or B) is duplicated?

A or B

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

OK or NG

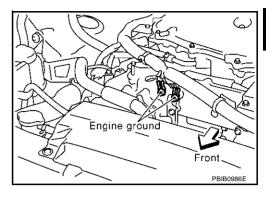
OK >> GO TO 3.

NG >> Reconnect the parts.

3. RETIGHTEN GROUND SCREWS

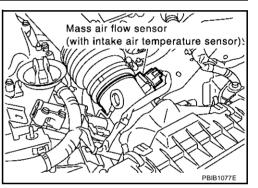
- 1. Turn ignition switch OFF.
- 2. Loosen and retighten engine ground screws.

>> GO TO 4.



4. CHECK MAF SENSOR POWER SUPPLY CIRCUIT

- 1. Disconnect mass air flow (MAF) sensor harness connector.
- 2. Turn ignition switch ON.

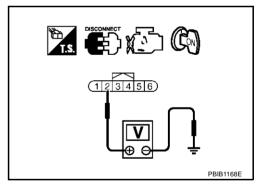


3. Check voltage between MAF sensor terminal 2 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 6. NG >> GO TO 5.



5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Joint connector-3
- Joint connector-4
- Harness for open or short between IPDM E/R and mass air flow sensor
- Harness for open or short between mass air flow sensor and ECM
 - >> Repair harness or connectors.

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6. CHECK MAF SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check harness continuity between MAF sensor terminal 3 and ECM terminal 67. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 8. NG >> GO TO 7.

7. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-3
- Harness for open or short between mass air flow sensor and ECM
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

8. CHECK MAF SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

 Check harness continuity between MAF sensor terminal 4 and ECM terminal 51. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 9.

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

9. CHECK MASS AIR FLOW SENSOR

Refer to EC-817, "Component Inspection".

OK or NG

OK >> GO TO 10.

NG >> Replace mass air flow sensor.

10. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

DTC P0101 MAF SENSOR

[TYPE 2]

Component Inspection MASS AIR FLOW SENSOR

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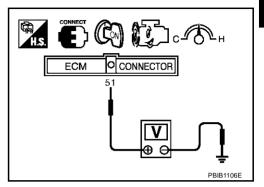
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- 1. Reconnect all harness connectors disconnected.
- 2. Start engine and warm it up to normal operating temperature.
- Check voltage between ECM terminal 51 (Mass air flow sensor signal) and ground.

Condition	Voltage V
Ignition switch "ON" (Engine stopped.)	Approx. 0.4
Idle (Engine is warmed-up to normal operating temperature.)	1.1 - 1.5
2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.7 - 2.4
Idle to about 4,000 rpm*	1.1 - 1.5 to Approx. 2.4



^{*:} Check for linear voltage rise in response to engine being increased to about 4,000 rpm.

- 4. If the voltage is out of specification, proceed the following.
 - Turn ignition switch OFF.
 - Disconnect mass air flow sensor harness connector and reconnect it again.
 - Perform steps 2 and 3 again.
- 5. If NG, remove mass air flow sensor from air duct. Check hot film for damage or dust.
- 6. If NG, clean or replace mass air flow sensor.

Removal and Installation MASS AIR FLOW SENSOR

ABS0082G

Refer to EM-16, "AIR CLEANER AND AIR DUCT".

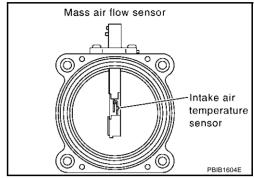
DTC P0102, P0103 MAF SENSOR

Component Description

PFP:22680

ABS0082H

The mass air flow sensor is placed in the stream of intake air. It measures the intake flow rate by measuring a part of the entire intake flow. It consists of a hot film that is supplied with electric current from the ECM. The temperature of the hot film is controlled by the ECM a certain amount. The heat generated by the hot film is reduced as the intake air flows around it. The more air, the greater the heat loss. Therefore, the ECM must supply more electric current to maintain the temperature of the hot film as air flow increases. The ECM detects the air flow by means of this current change.



CONSULT-II Reference Value in Data Monitor Mode

ARSON821

Specification data are reference values.

MONITOR ITEM	CON	NDITION	SPECIFICATION
	Engine: After warming up	Idle	Approx. 1.1 - 1.5V
MAS A/F SE-B1	Air conditioner switch: OFF		
IVIAG A/T GE-BT	• Shift lever: N (A/T), Neutral (M/T)	2,500 rpm	Approx. 1.6 - 2.4V
	No-load		
	Engine: After warming up	Idle	5% - 35%
CAL/LD VALUE	• Shift lever: N (A/T), Neutral (M/T)		
CAL/LD VALUE	Air conditioner switch: OFF	2,500 rpm	5% - 35%
	No-load		
	Engine: After warming up	Idle	2.0 - 6.0 g·m/s
MASS AIRFLOW	• Shift lever: N (A/T), Neutral (M/T)		
WASS AINFLOW	Air conditioner switch: OFF	2,500 rpm	7.0 - 20.0 g⋅m/s
	No-load		

On Board Diagnosis Logic

ABS0082J

These self-diagnoses have the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0102 0102	Mass air flow 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.) Intake air leaks Mass air flow sensor
P0103 0103	Mass air flow 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.) Mass air flow sensor

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode and the MIL lights up.

Detected items	Engine operating condition in fail-safe mode
Mass air flow sensor circuit	Engine speed will not rise more than 2,400 rpm due to the fuel cut.

DTC P0102, P0103 MAF SENSOR

[TYPE 2]

DTC Confirmation Procedure

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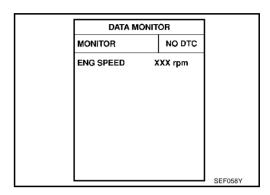
NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

PROCEDURE FOR DTC P0102

(P) With CONSULT-II

- Turn ignition switch ON.
- Select "DATA MONITOR" mode with CONSULT-II.
- 3. Start engine and wait at least 5 seconds.
- 4. If DTC is detected, go to EC-821, "Diagnostic Procedure".



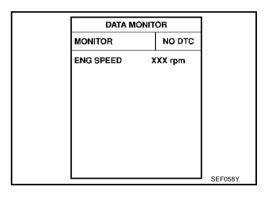
With GST

Follow the procedure "With CONSULT-II" above.

PROCEDURE FOR DTC P0103

(With CONSULT-II

- 1. Turn ignition switch ON.
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- Wait at least 5 seconds.
- If DTC is detected, go to <u>EC-821, "Diagnostic Procedure"</u>.
 If DTC is not detected, go to next step.
- 5. Start engine and wait at least 5 seconds.
- If DTC is detected, go to <u>EC-821, "Diagnostic Procedure"</u>.



With GST

Follow the procedure "With CONSULT-II" above.

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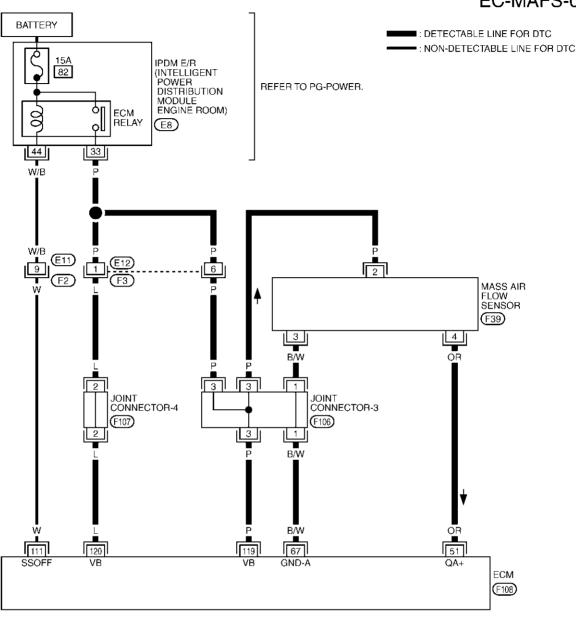
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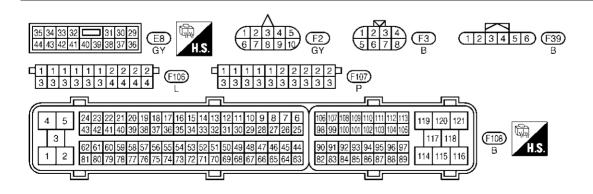
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Wiring Diagram

ABSO082L

EC-MAFS-01





TBWT0413E

DTC P0102, P0103 MAF SENSOR

[TYPE 2]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
51 OR	OR	Mass air flow sensor	[Engine is running]Warm-up conditionIdle speed[Engine is running]	1.1 - 1.5V
			 Warm-up condition Engine speed is 2,500 rpm. 	1.7 - 2.4V
67	B/W	Sensors' ground (Mass air flow sensor / IAT sensor / Power steering pressure sensor / EVAP control system pressure sensor)	[Engine is running] • Warm-up condition • Idle speed	Approximately 0V
111 W	W	N ECM relay (Self shut-off)	[Engine is running] [Ignition switch: OFF] • For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF] • A few seconds passed after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
119 120	P L	Power supply for ECM	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

1. INSPECTION START

Which malfunction (P0102 or P0103) is duplicated?

P0102 or P0103

P0102 >> GO TO 2.

P0103 >> GO TO 3.

2. CHECK INTAKE SYSTEM

Check the following for connection.

- Air duct
- Vacuum hoses
- Intake air passage between air duct and intake manifold

OK or NG

OK >> GO TO 3.

NG >> Reconnect the parts.

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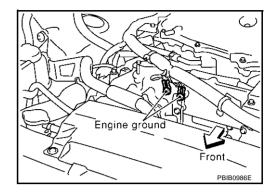
ABS0082M

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$\overline{3}$. RETIGHTEN GROUND SCREWS

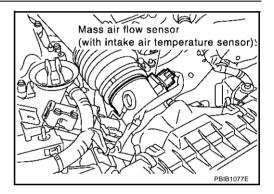
- 1. Turn ignition switch OFF.
- 2. Loosen and retighten engine ground screws.

>> GO TO 4.



4. CHECK MAF SENSOR POWER SUPPLY CIRCUIT

- 1. Disconnect mass air flow (MAF) sensor harness connector.
- 2. Turn ignition switch ON.

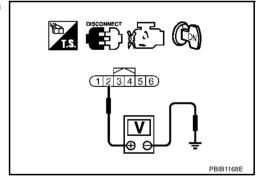


3. Check voltage between MAF sensor terminal 2 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 6. NG >> GO TO 5.



5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Joint connector-3
- Joint connector-4
- Harness for open or short between IPDM E/R and mass air flow sensor
- Harness for open or short between mass air flow sensor and ECM
 - >> Repair harness or connectors.

DTC P0102, P0103 MAF SENSOR

[TYPE 2]

6. CHECK MAF SENSOR GROUND CIRCUIT FOR OPEN AND SHORT	А
 Turn ignition switch OFF. Disconnect ECM harness connector. Check harness continuity between MAF sensor terminal 3 and ECM terminal 67. Refer to Wiring Diagram. 	EC
Continuity should exist. 4. Also check harness for short to ground and short to power. OK or NG	С
OK >> GO TO 8. NG >> GO TO 7.	D
7. DETECT MALFUNCTIONING PART	Е
 Check the following. Joint connector-3 Harness for open or short between mass air flow sensor and ECM 	F
>> Repair open circuit or short to ground or short to power in harness or connectors.	G
8. CHECK MAF SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT	
Check harness continuity between MAF sensor terminal 4 and ECM terminal 51. Refer to Wiring Diagram.	Н
Continuity should exist.	ı
2. Also check harness for short to ground and short to power.	
OK or NG OK >> GO TO 9. NG >> Repair open circuit or short to ground or short to power in harness or connectors.	J
9. CHECK MASS AIR FLOW SENSOR	K
Refer to EC-817, "Component Inspection" .	
OK or NG OK >> GO TO 10. NG >> Replace mass air flow sensor.	L
10 CHECK INTERMITTENT INCIDENT	I. A

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

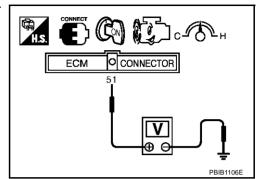
>> INSPECTION END

Component Inspection MASS AIR FLOW SENSOR

ABS0082N

- Reconnect all harness connectors disconnected.
- 2. Start engine and warm it up to normal operating temperature.
- Check voltage between ECM terminal 51 (Mass air flow sensor signal) and ground.

Condition	Voltage V
Ignition switch "ON" (Engine stopped.)	Approx. 0.4
Idle (Engine is warmed-up to normal operating temperature.)	1.1 - 1.5
2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.7 - 2.4
Idle to about 4,000 rpm*	1.1 - 1.5 to Approx. 2.4



^{*:} Check for linear voltage rise in response to engine being increased to about 4,000 rpm.

- 4. If the voltage is out of specification, proceed the following.
 - Turn ignition switch OFF.
 - Disconnect mass air flow sensor harness connector and reconnect it again.
 - Perform steps 2 and 3 again.
- 5. If NG, remove mass air flow sensor from air duct. Check hot film for damage or dust.
- 6. If NG, clean or replace mass air flow sensor.

Removal and Installation MASS AIR FLOW SENSOR

ABS00820

Refer to EM-16, "AIR CLEANER AND AIR DUCT".

[TYPE 2]

DTC P0112, P0113 IAT SENSOR

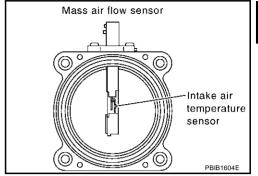
PFP:22630

Component Description

ABS0082P

The intake air temperature sensor is built-into mass air flow sensor. The sensor detects intake air temperature and transmits a signal to

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 temperature rise.



<Reference data>

Intake air temperature °C (°F)	Voltage* V	Resistance kΩ
25 (77)	3.32	1.94 - 2.06
80 (176)	1.23	0.295 - 0.349

^{*:} These data are reference values and are measured between ECM terminal 34 (Intake air temperature sensor) and ground.

Acceptable Resistance ka 1.0 0.4 0.2 0 20 40 60 80 100 (32) (68) (104) (140) (176) (212) Temperature °C (°F) SEF012P

CAUTION:

Do not 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.

On Board Diagnosis Logic

ABS00820

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0112 0112	Intake air 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.) Intake air temperature sensor
P0113 0113	Intake air tempera- ture sensor circuit high input	An excessively high voltage from the sensor is sent to ECM.	

DTC Confirmation Procedure

ABS0082R

NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

(P) WITH CONSULT-II

- Turn ignition switch ON.
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- Wait at least 5 seconds.
- If 1st trip DTC is detected, go to EC-828, "Diagnostic Procedure"

DATA MONITOR MONITOR NO DTC ENG SPEED XXX rpm

EC-825 Revision; 2004 April 2003 G35 Sedan

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DTC P0112, P0113 IAT SENSOR

[TYPE 2]

WITH GST

Follow the procedure "With CONSULT-II" above.

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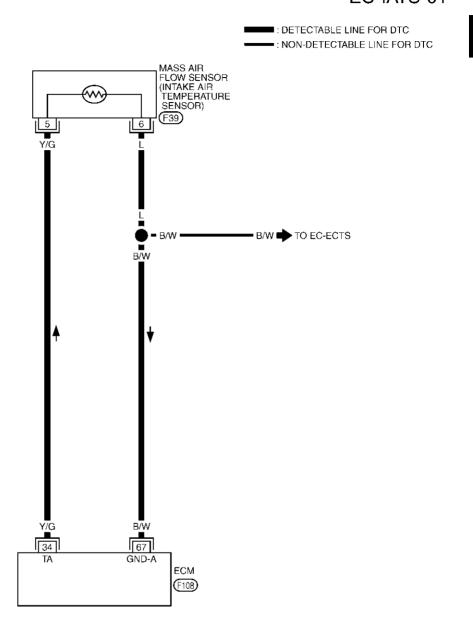
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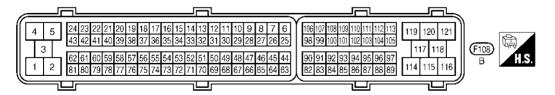
Wiring Diagram

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EC-IATS-01







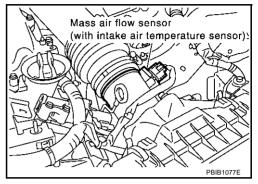
TBWT0263E

Diagnostic Procedure

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1. CHECK INTAKE AIR TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect mass air flow sensor (intake air temperature sensor is built-into) harness connector.
- 3. Turn ignition switch ON.



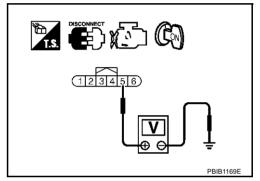
4. Check voltage between mass air flow sensor terminal 5 and ground.

Voltage: Approximately 5V

OK or NG

OK >> GO TO 2.

NG >> Repair harness or connectors.



2. CHECK INTAKE AIR TEMPERATURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM.
- Check harness continuity between mass air flow sensor terminal 6 and ECM terminal 67. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 3.

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

3. CHECK INTAKE AIR TEMPERATURE SENSOR

Refer to EC-829, "Component Inspection".

OK or NG

OK >> GO TO 4.

NG >> Replace mass air flow sensor (with intake air temperature sensor).

4. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

DTC P0112, P0113 IAT SENSOR

[TYPE 2]

Component Inspection INTAKE AIR TEMPERATURE SENSOR

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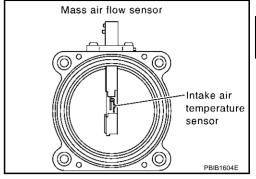
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1. Check resistance between mass air flow sensor terminals 5 and 6 under the following conditions.

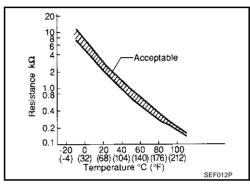
Intake air temperature °C (°F)	Resistance kΩ
25 (77)	1.94 - 2.06

2. If NG, replace mass air flow sensor (with intake air temperature sensor).



Removal and Installation MASS AIR FLOW SENSOR

ABS0082V



Refer to EM-16, "AIR CLEANER AND AIR DUCT" .

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DTC P0117, P0118 ECT SENSOR

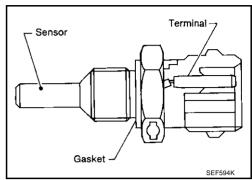
mistor decreases as temperature increases.

PFP:22630

ARS0082W

Component Description

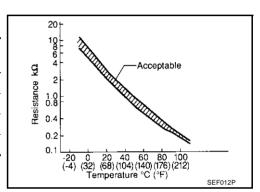
The engine coolant temperature sensor is used to detect the engine coolant temperature. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the engine coolant temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the ther-



<Reference data>

Engine coolant 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

^{*:} These data are reference values and are measured between ECM terminal 73 (Engine coolant temperature sensor) and ground.



CAUTION:

Do not 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.

On Board Diagnosis Logic

ABS0082X

These self-diagnoses have the one trip detection logic.

DTC No.	Trouble Diagnosis Name	DTC Detecting Condition	Possible Cause
P0117 0117	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 0118	Engine coolant tem- perature sensor cir- cuit high input	An excessively high voltage from the sensor is sent to ECM.	· · · · · · · · · · · · · · · · · · ·

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode and the MIL lights up.

Detected items	Engine operating condition in fail-safe mode		
	Engine coolant temperature will be determined by ECM based on the time after turning ignition switch "ON" or "START". CONSULT-II displays the engine coolant temperature decided by ECM.		
	Condition	Engine coolant temperature decided (CONSULT-II display)	
Engine coolant temper-	Just as ignition switch is turned ON or Start	40°C (104°F)	
ature sensor circuit	More than approx. 4 minutes after ignition ON or Start	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 tempera while engine is running.	ature sensor is activated, the cooling fan operates	

DTC P0117, P0118 ECT SENSOR

[TYPE 2]

DTC Confirmation Procedure

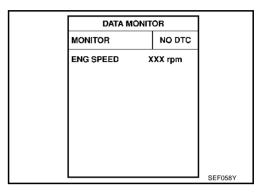
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NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

(P) WITH CONSULT-II

- 1. Turn ignition switch ON.
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- 3. Wait at least 5 seconds.
- 4. If DTC is detected, go to EC-833, "Diagnostic Procedure".



WITH GST

Follow the procedure "WITH CONSULT-II" above.

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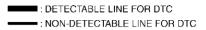
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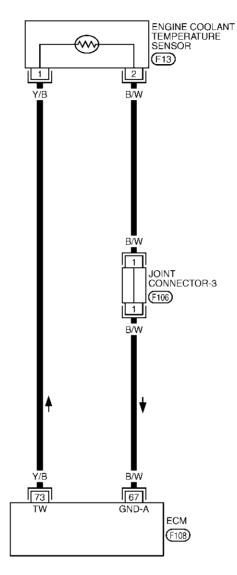
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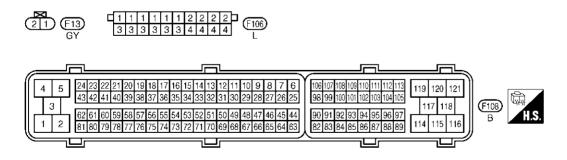
Wiring Diagram

4*B*S00827

EC-ECTS-01







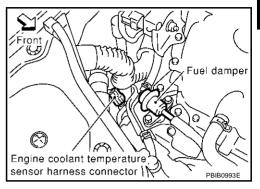
TBWT0264E

[TYPE 2]

Diagnostic Procedure

1. CHECK ECT SENSOR POWER SUPPLY CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect engine coolant temperature (ECT) sensor harness connector.
- 3. Turn ignition switch ON.



4. Check voltage between ECT sensor terminal 1 and ground with CONSULT-II or tester.

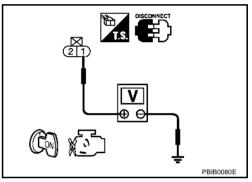
Voltage: Approximately 5V

OK or NG

OK >> GO TO 2.

NG >> Repair o

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



2. CHECK ECT SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.

2. Check harness continuity between ECT sensor terminal 2 and ECM terminal 67. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 4.

NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-3
- Harness for open and short between ECT sensor and ECM
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK ENGINE COOLANT TEMPERATURE SENSOR

Refer to EC-834, "Component Inspection".

OK or NG

OK >> GO TO 5.

NG >> Replace engine coolant temperature sensor.

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5. CHECK INTERMITTENT INCIDENT

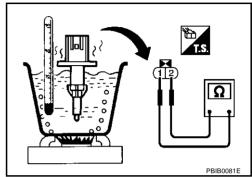
Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

Component Inspection ENGINE COOLANT TEMPERATURE SENSOR

ABS00831

1. Check resistance between engine coolant temperature sensor terminals 1 and 2 as shown in the figure.



<Reference data>

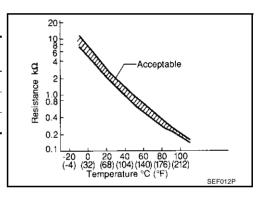
Engine coolant temperature °C (°F)	Voltage* V	Resistance k Ω
20 (68)	3.5	2.1 - 2.9
50 (122)	2.2	0.68 - 1.00
90 (194)	0.9	0.236 - 0.260

^{*:} These data are reference values and are measured between ECM terminal 73 (Engine coolant temperature sensor) and ground.

2. If NG, replace engine coolant temperature sensor.

Removal and Installation ENGINE COOLANT TEMPERATURE SENSOR





ABS00832

DTC P0122, P0123 TP SENSOR

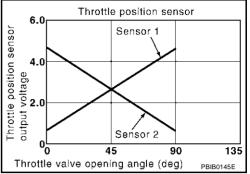
PFP:16119

Component Description

ABS00833

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 the 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.



CONSULT-II Reference Value in Data Monitor Mode

ABS00834

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
THRTL SEN1	• Ignition switch: ON	Accelerator pedal: Fully released	More than 0.36V
THRTL SEN2*	(Engine stopped) ■ Shift lever: D (A/T), 1st (M/T)	Accelerator pedal: Fully depressed	Less than 4.75V

^{*:} Throttle position sensor 2 signal is converted by ECM internally. Thus, it differs from ECM terminal voltage signal.

On Board Diagnosis Logic

ARSONDO

These self-diagnoses have the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	
P0122 0122	Throttle position sensor 2 circuit low input	An excessively low voltage from the TP sensor 2 is sent to ECM.	Harness or connectors (TP sensor 2 circuit is open or shorted.)	
P0123 0123	Throttle position sensor 2 circuit high input	An excessively high voltage from the TP sensor 2 is sent to ECM.	 (APP sensor 2 circuit is shorted.) Electric throttle control actuator (TP sensor 2) 	
			 Accelerator pedal position sensor (APP sensor 2) 	

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Engine operation condition in fail-safe mode

ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10

ECM regulates the opening speed of the throttle valve to be slower than the normal condition.

So, the acceleration will be poor.

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DTC Confirmation Procedure

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NOTE:

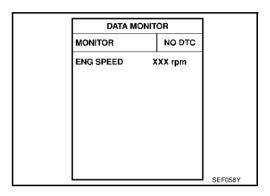
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

(P) WITH CONSULT-II

- 1. Turn ignition switch ON.
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- 3. Start engine and let it idle for 1 second.
- 4. If DTC is detected, go to EC-838, "Diagnostic Procedure".



WITH GST

Follow the procedure "WITH CONSULT-II" above.

Wiring Diagram

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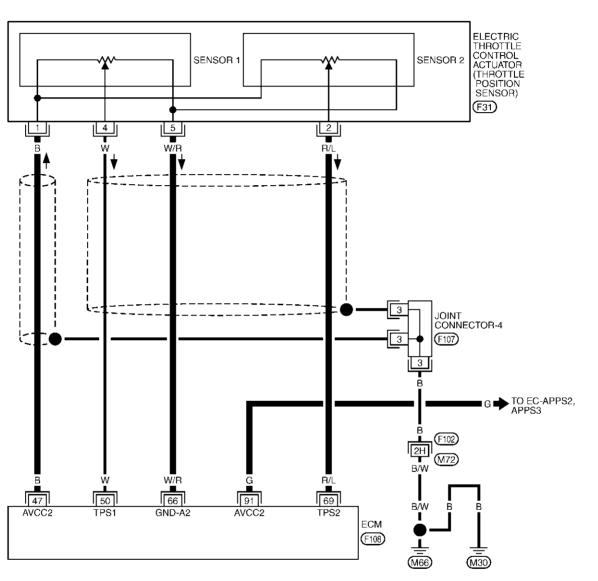
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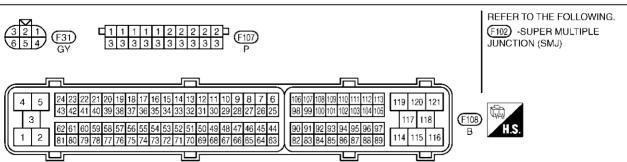
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EC-TPS2-01







TBWB0068E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
47	В	Sensors' power supply (Throttle position sensor)	[Ignition switch: ON]	Approximately 5V
50	W	Throttle position sensor 1	 [Ignition switch: ON] Engine stopped Shift lever: D (A/T) or 1st (M/T) Accelerator pedal fully released 	More than 0.36V
50	VV	Throttle position sensor i	 [Ignition switch: ON] Engine stopped Shift lever: D (A/T) or 1st (M/T) Accelerator pedal fully depressed 	Less than 4.75V
66	W/R	Sensors' ground (Throttle position sensor)	[Engine is running]Warm-up conditionIdle speed	Approximately 0V
69	R/L	Throttle position concer 2	 [Ignition switch: ON] Engine stopped Shift lever: D (A/T) or 1st (M/T) Accelerator pedal fully released 	Less than 4.75V
09	N/L	Throttle position sensor 2	 [Ignition switch: ON] Engine stopped Shift lever: D (A/T) or 1st (M/T) Accelerator pedal fully depressed 	More than 0.36V
91	G	Sensors' power supply (APP sensor 2)	[Ignition switch: ON]	Approximately 5V

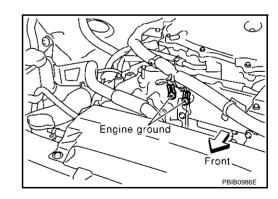
Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

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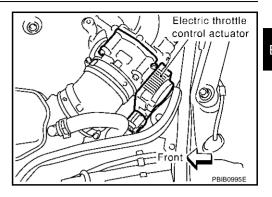
- Turn ignition switch OFF.
- 2. Loosen and retighten engine ground screws.

>> GO TO 2.



2. CHECK THROTTLE POSITION SENSOR 2 POWER SUPPLY CIRCUIT-I

- 1. Disconnect electric throttle control actuator harness connector.
- 2. Turn ignition switch ON.

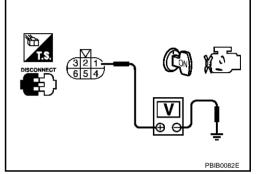


3. Check voltage between electric throttle control actuator terminal 1 and ground with CONSULT-II or tester.

Voltage: Approximately 5V

OK or NG

OK >> GO TO 7. NG >> GO TO 3.



3. CHECK THROTTLE POSITION SENSOR 2 POWER SUPPLY CIRCUIT-II

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check harness continuity between electric throttle control actuator terminal 1 and ECM terminal 47. Refer to Wiring Diagram.

Continuity should exist.

OK or NG

OK >> GO TO 4.

NG >> Repair or replace open circuit.

4. CHECK THROTTLE POSITION SENSOR 2 POWER SUPPLY CIRCUIT-III

Check harness for short to power and short to ground, between the following terminals.

ECM terminal	Sensor terminal	Reference Wiring Diagram
47	Electric throttle control actuator terminal 1	EC-837
91	APP sensor terminal 4	EC-1220

OK or NG

OK >> GO TO 5.

NG >> Repair short to ground or short to power in harness or connectors.

5. CHECK APP SENSOR

Refer to EC-1224, "Component Inspection".

OK or NG

OK >> GO TO 11. NG >> GO TO 6.

Revision; 2004 April EC-839 2003 G35 Sedan

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6. REPLACE ACCELERATOR PEDAL ASSEMBLY

- 1. Replace the accelerator pedal assembly.
- 2. Perform EC-692, "Accelerator Pedal Released Position Learning".
- 3. Perform EC-692, "Throttle Valve Closed Position Learning".
- 4. Perform EC-692, "Idle Air Volume Learning".

>> INSPECTION END

7. CHECK THROTTLE POSITION SENSOR 2 GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check harness continuity between electric throttle control actuator terminal 5 and ECM terminal 66. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 8.

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

8. CHECK THROTTLE POSITION SENSOR 2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

 Check harness continuity between ECM terminal 69 and electric throttle control actuator terminal 2. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 9.

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

9. CHECK THROTTLE POSITION SENSOR

Refer to EC-841. "Component Inspection".

OK or NG

OK >> GO TO 11.

NG >> GO TO 10.

10. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

- 1. Replace the electric throttle control actuator.
- Perform <u>EC-692</u>, "Throttle Valve Closed Position Learning".
- 3. Perform EC-692, "Idle Air Volume Learning".

>> INSPECTION END

11. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

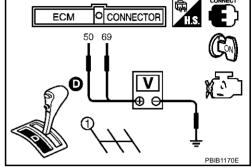
>> INSPECTION END

Component Inspection THROTTLE POSITION SENSOR

ABS00839

- Reconnect all harness connectors disconnected.
- 2. Perform EC-692, "Throttle Valve Closed Position Learning".
- Turn ignition switch ON.
- 4. Set selector lever to D (A/T) or 1st (M/T) position.
- Check voltage between ECM terminals 50 (TP sensor 1signal),
 69 (TP sensor 2signal) and engine ground under the following conditions.

Terminal	Accelerator pedal	Voltage
50	Fully released	More than 0.36V
(Throttle position sensor 1)	Fully depressed	Less than 4.75V
69	Fully released	Less than 4.75V
(Throttle position sensor 2)	Fully depressed	More than 0.36V



- 6. If NG, replace electric throttle control actuator and go to the next step.
- 7. Perform EC-692, "Throttle Valve Closed Position Learning".
- 8. Perform EC-692, "Idle Air Volume Learning".

Removal and Installation **ELECTRIC THROTTLE CONTROL ACTUATOR**

Refer to EM-18, "INTAKE MANIFOLD COLLECTOR".

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DTC P0125 ECT SENSOR

PFP:22630

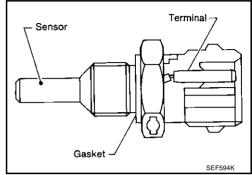
Component Description

ABS0083B

NOTE:

If DTC P0125 is displayed with P0117 or P0118, first perform the trouble diagnosis for DTC P0117 or P0118. Refer to $\frac{EC-830}{C}$.

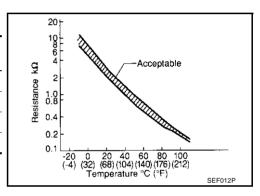
The engine coolant temperature sensor is used to detect the engine coolant temperature. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the engine coolant temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The 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	2.1 - 2.9
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 terminal 73 (Engine coolant temperature sensor) and ground.



CAUTION:

Do not 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.

On Board Diagnosis Logic

ABS0083C

This self-diagnosis has the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0125 0125	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 P0125 ECT SENSOR

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DTC Confirmation Procedure

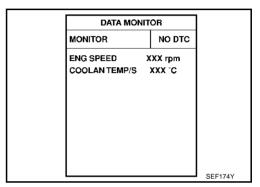
CAUTION:

Be careful not to overheat engine.

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-II

- Turn ignition switch ON.
- Select "DATA MONITOR" mode with CONSULT-II.
- Check that "COOLAN TEMP/S" is above 10°C (50°F). If it is above 10°C (50°F), the test result will be OK. If it is below 10°C (50°F), go to following step.
- 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.
- 5. If 1st trip DTC is detected, go to EC-843, "Diagnostic Procedure"



WITH GST

Follow the procedure "WITH CONSULT-II" above.

Diagnostic Procedure

ABS0083E

1. CHECK ENGINE COOLANT TEMPERATURE SENSOR

Refer to EC-844, "Component Inspection".

OK or NG

OK >> GO TO 2

NG >> Replace engine coolant temperature sensor.

2. CHECK THERMOSTAT OPERATION

When the engine is cold [lower than 70°C (158°F)] condition, grasp lower radiator hose and confirm the engine coolant does not flow.

OK or NG

OK >> GO TO 3.

NG >> Repair or replace thermostat. Refer to CO-30, "THERMOSTAT AND THERMOSTAT HOUSING".

3. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT". Refer to EC-832, "Wiring Diagram".

>> INSPECTION END

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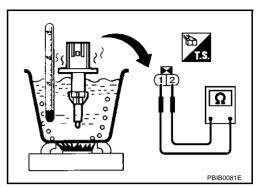
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Component Inspection ENGINE COOLANT TEMPERATURE SENSOR

ABS0083F

1. Check resistance between engine coolant temperature sensor terminals 1 and 2 as shown in the figure.



<Reference data>

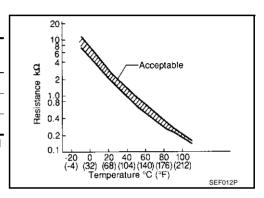
Engine coolant temperature °C (°F)	Voltage* V	Resistance k Ω
20 (68)	3.5	2.1 - 2.9
50 (122)	2.2	0.68 - 1.00
90 (194)	0.9	0.236 - 0.260

^{*:} These data are reference values and are measured between ECM terminal 73 (Engine coolant temperature sensor) and ground.

2. If NG, replace engine coolant temperature sensor.

Removal and Installation ENGINE COOLANT TEMPERATURE SENSOR

Refer to CO-30, "THERMOSTAT AND THERMOSTAT HOUSING".



ABS0083G

[TYPE 2]

DTC P0127 IAT SENSOR

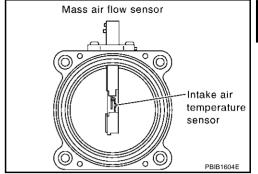
PFP:22630

Component Description

ARS0083H

The intake air temperature sensor is built into mass air flow sensor. The sensor detects intake air temperature and transmits a signal to

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 temperature rise.



<Reference data>

Intake air temperature °C (°F)	Voltage* V	Resistance kΩ	
25 (77)	3.32	1.94 - 2.06	
80 (176)	1.23	0.295 - 0.349	

^{*:} These data are reference values and are measured between ECM terminal 34 (Intake air temperature sensor) and ground.

20 Acceptable Resistance ka 1.0 0.4 0.2 0 20 40 60 80 100 (32) (68) (104) (140) (176) (212) Temperature °C (°F) SEF012P

CAUTION:

Do not 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.

On Board Diagnosis Logic

ABS0083

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0127 0127	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

ABS0083J

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NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

Always drive vehicle at a safe speed.

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.

(P) WITH CONSULT-II

- 1. Wait until engine coolant temperature is less than 90°C (194°F)
- Turn ignition switch ON.

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EC-845 Revision; 2004 April

- Select "DATA MONITOR" mode with CONSULT-II.
- c. Check the engine coolant temperature.
- d. If the engine coolant temperature is not less than 90°C (194°F), turn ignition switch OFF and cool down engine.
 - 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-II.
- 4. Start engine.
- Hold vehicle speed at more than 70 km/h (43 MPH) for 100 consecutive seconds.
- 6. If 1st trip DTC is detected, go to EC-846, "Diagnostic Procedure".

WITH GST

Follow the procedure "WITH CONSULT-II" above.

Diagnostic Procedure

1. CHECK INTAKE AIR TEMPERATURE SENSOR

Refer to EC-829, "Component Inspection".

OK or NG

OK >> GO TO 2.

NG >> Replace mass air flow sensor (with intake air temperature sensor).

2. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

Refer to EC-827, "Wiring Diagram".

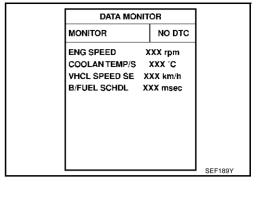
>> INSPECTION END

Component Inspection INTAKE AIR TEMPERATURE SENSOR

 Check resistance between intake air temperature sensor terminals 5 and 6 under the following conditions.

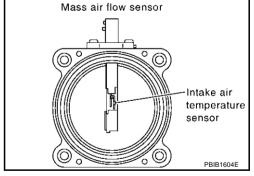
Intake air temperature °C (°F)	Resistance kΩ
25 (77)	1.94 - 2.06

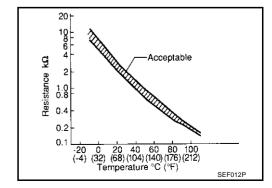
2. If NG, replace mass air flow sensor (with intake air temperature sensor).



ABS0083L

ABS0083K





DTC P0127 IAT SENSOR

[TYPE 2]

Removal and Installation MASS AIR FLOW SENSOR

ABS0083M

Refer to EM-16, "AIR CLEANER AND AIR DUCT".

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DTC P0128 THERMOSTAT FUNCTION

PFP:21200

On Board Diagnosis Logic

ABS0083N

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 stuck open.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0128 0128	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

ABS00830

NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

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 60°C (140°F).

(A) WITH CONSULT-II

- 1. Replace thermostat with new one. Refer to <a>CO-30 . Use only a genuine NISSAN thermostat as a replacement. If an incorrect thermostat is used, the MIL may come on.
- 2. Turn ignition switch ON.
- 3. Select "COOLAN TEMP/S" in "DATA MONITOR" mode with CONSULT-II.
- Check that the "COOLAN TEMP/S" is above 60°C (140°F).
 If it is below 60°C (140°F), go to following step.
 If it is above 60°C (140°F), cool down the engine to less than 60°C (140°F), then retry from step 1.
- 5. Drive vehicle for 10 consecutive minutes under the following conditions.

VHCL SPEED SE	80 - 120 km/h (50 - 75 MPH)

If 1st trip DTC is detected, go to EC-848, "Diagnostic Procedure".

WITH GST

1. Follow the procedure "WITH CONSULT-II" above.

Diagnostic Procedure

ABS0083F

1. CHECK ENGINE COOLANT TEMPERATURE SENSOR

Refer to EC-849, "Component Inspection".

OK or NG

OK >> INSPECTION END

NG >> Replace engine coolant temperature sensor.

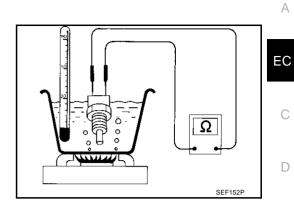
DTC P0128 THERMOSTAT FUNCTION

[TYPE 2]

Component Inspection ENGINE COOLANT TEMPERATURE SENSOR

ABS0083Q

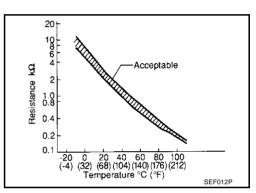
Check resistance as shown in the figure.



<Reference data>

Temperature °C (°F)	Resistance kΩ
20 (68)	2.1 - 2.9
50 (122)	0.68 - 1.0
90 (194)	0.236 - 0.260

If NG, replace engine coolant temperature sensor.



ABS0083R

Removal and Installation ENGINE COOLANT TEMPERATURE SENSOR

Refer to CO-30, "THERMOSTAT AND THERMOSTAT HOUSING".

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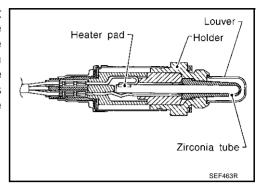
DTC P0132, P0152 HO2S1

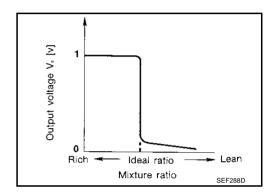
PFP:22690

Component Description

ABS0083S

The heated oxygen sensor 1 is placed into the exhaust manifold. It detects the amount of oxygen in the exhaust gas compared to the outside air. The heated oxygen sensor 1 has a closed-end tube made of ceramic zirconia. The zirconia generates voltage from approximately 1V in richer conditions to 0V in leaner conditions. The heated oxygen sensor 1 signal is sent to the ECM. The ECM adjusts the injection pulse duration to achieve the ideal air-fuel ratio. The ideal air-fuel ratio occurs near the radical change from 1 to 0V.





CONSULT-II Reference Value in Data Monitor Mode

ABS0083T

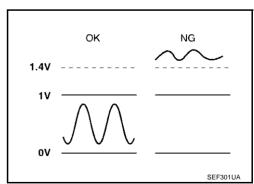
Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
HO2S1 (B1) HO2S1 (B2)	Engine: After warming up	Maintaining engine speed at 2,000 rpm	0 - 0.3V ←→ Approx. 0.6 - 1.0V
HO2S1 MNTR (B1) HO2S1 MNTR (B2)	Engine: After warming up	Maintaining engine speed at 2,000 rpm	LEAN ←→ RICH Changes more than 5 times during 10 seconds.

On Board Diagnosis Logic

ABS0083U

To judge the malfunction, the diagnosis checks that the heated oxygen sensor 1 output is not inordinately high.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0132 0132 (Bank 1) P0152 0152 (Bank 2)	Heated oxygen sensor 1 circuit high voltage	An excessively high voltage from the sensor is sent to ECM.	Harness or connectors (The sensor circuit is open or shorted) Heated oxygen sensor 1

DTC Confirmation Procedure

NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

(A) WITH CONSULT-II

- Start engine and warm it up to normal operating temperature.
- Turn ignition switch OFF and wait at least 10 seconds. 2.
- 3. Turn ignition switch ON.
- Select "DATA MONITOR" mode with CONSULT-II.
- Restart engine and let it idle for 2 minutes.
- 6. If 1st trip DTC is detected, go to EC-855, "Diagnostic Procedure"

MONITOR ENG SPEED XXX rpm COOLAN TEMP/S XXX °C

DATA MONITOR

NO DTC

WITH GST

- Start engine and warm it up to normal operating temperature.
- Turn ignition switch OFF and wait at least 10 seconds.
- Restart engine and let it idle for 2 minutes.
- 4. Turn ignition switch OFF and wait at least 10 seconds.
- Restart engine and let it idle for 2 minutes.
- 6. Select "MODE 3" with GST.
- 7. If DTC is detected, go to EC-855, "Diagnostic Procedure".
- When using GST, DTC Confirmation Procedure should be performed twice as much as when using CONSULT-II because GST cannot display MODE 7 (1st trip DTC) concerning this diagnosis. Therefore, using CONSULT-II is recommended.

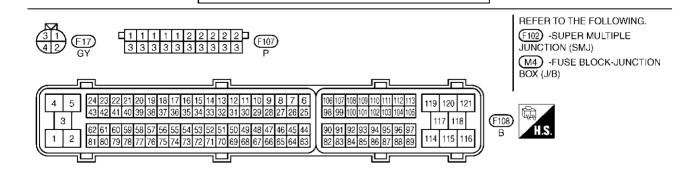
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Wiring Diagram BANK 1 ABS0083W EC-02S1B1-01 IGNITION SWITCH ON OR START FUSE BLOCK REFER TO PG-POWER. (J/B) 15 (M4) 9, R/B -1, (M72) (F102) : DETECTABLE LINE FOR DTC R/B : NON-DETECTABLE LINE FOR DTC R/B HEATED OXYGEN SENSOR 1 (BANK 1) (F17) 3 W/B G/B JOINT CONNECTOR-4 (F107) W/B G/B 78 24 O2HFR



ECM (F108)

TBWT0414E

DTC P0132, P0152 HO2S1

[TYPE 2]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
35	W/B	Heated oxygen sensor 1 (bank 1)	[Engine is running]Warm-up conditionEngine speed is 2,000 rpm.	0 - Approximately 1.0V (Periodically change)
78	В/Ү	Sensors' ground (Heated oxygen sensor)	[Engine is running] • Warm-up condition • Idle speed	Approximately 0V

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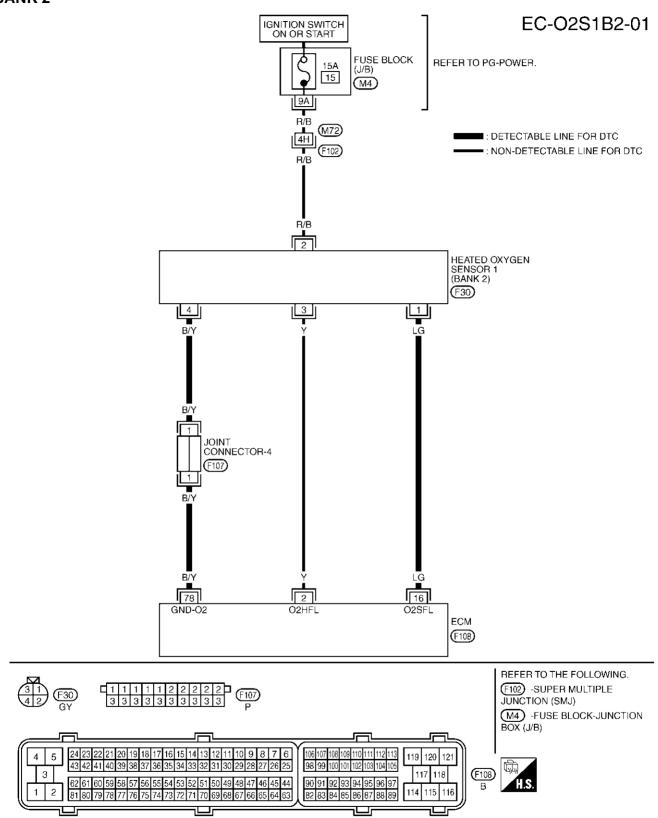
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BANK 2



TBWT0266E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

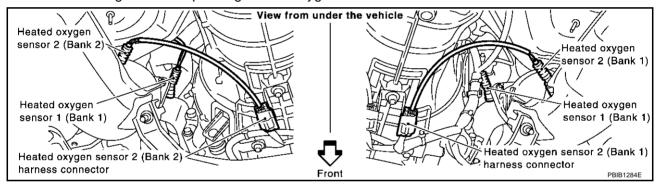
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
16	LG	Heated oxygen sensor 1 (bank 2)	[Engine is running]Warm-up conditionEngine speed is 2,000 rpm.	0 - Approximately 1.0V (Periodically change)
78	B/Y	Sensors' ground (Heated oxygen sensor)	[Engine is running] • Warm-up condition • Idle speed	Approximately 0V

Diagnostic Procedure

1. RETIGHTEN HEATED OXYGEN SENSOR 1

- 1. Turn ignition switch OFF.
- 2. Loosen and retighten corresponding heated oxygen sensor 1.



Tightening torque: 40 - 50 N·m (4.1 - 5.1 kg-m, 30 - 37 ft-lb)

>> GO TO 2.

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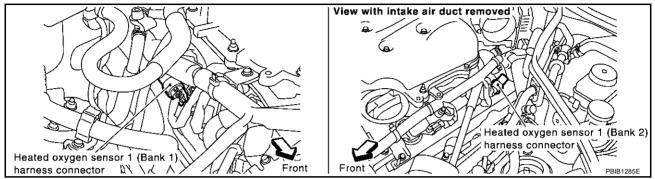
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$\overline{2}$. CHECK HO2S1 GROUND CIRCUIT FOR OPEN AND SHORT

- Disconnect ECM harness connector.
- Disconnect heated oxygen sensor 1 harness connector.



Check harness continuity between HO2S1 terminal 4 and ECM terminal 78. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 4. NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-4
- Harness for open or short between HO2S1 and ECM
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK HO2S1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

 Check harness continuity between ECM terminal and HO2S1 terminal as follows. Refer to Wiring Diagram.

DTC	Term	Bank	
ыс	ECM	Sensor	Dalik
P0132	35	1	1
P0152	16	1	2

Continuity should exist.

2. Check harness continuity between the following terminals and ground. Refer to Wiring Diagram.

DTC	Term	Bank	
DIC	ECM	Sensor	Dalik
P0132	35	1	1
P0152	16	1	2

Continuity should not exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 5.

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

5. CHECK HO2S1 CONNECTOR FOR WATER

- 1. Turn ignition switch OFF.
- 2. Disconnect heated oxygen sensor 1 harness connector.
- 3. Check connectors for water.

Water should not exist.

OK or NG

OK >> GO TO 6.

NG >> Repair or replace harness or connectors.

6. CHECK HEATED OXYGEN SENSOR 1

Refer to EC-858, "Component Inspection".

OK or NG

OK >> GO TO 7.

NG >> Replace malfunctioning heated oxygen sensor 1.

7. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> INSPECTION END

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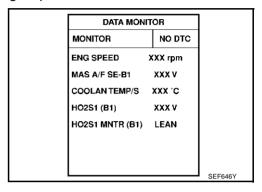
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Component Inspection HEATED OXYGEN SENSOR 1

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(P) With CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- Select "MANU TRIG" and adjust "TRIGGER POINT" to 100% in "DATA MONITOR" mode with CONSULT-II.
- 3. Select "HO2S1 (B1)/(B2)" and "HO2S1 MNTR (B1)/(B2)".
- 4. Hold engine speed at 2,000 rpm under no load during the following steps.
- Touch "RECORD" on CONSULT-II screen.



- 6. Check the following.
 - "HO2S1 MNTR (B1)/(B2)" in "DATA MONITOR" mode changes from "RICH" to "LEAN" to "RICH" 5 times in 10 seconds.
 - 5 times (cycles) are counted as shown at right.
 - "HO2S1 (B1)/(B2)" voltage goes above 0.6V at least once.
 - "HO2S1 (B1)/(B2)" voltage goes below 0.3V at least once.
 - "HO2S1 (B1)/(B2)" voltage never exceeds 1.0V.

Bank 1
cycle 1 2 3 4 5
HO2S1 MNTR (B1) R-L-R-L-R-L-R-L-R
Bank 2
cycle 1 2 3 4 5
HO2S1 MNTR (B2) R-L-R-L-R-L-R-L-R
R means HO2S1
MNTR (B1)/(B2) indicates RICH
L means HO2S1
MNTR (B1)/(B2) indicates LEAN SEF647Y

Trigger	ENG SPEED	HO2S1 (B1)	128		Ma>	ximum	1		√ `.	,	`.			Maximum voltage should be over 0.6V
1 222	rpm	V		/	j	-I	ì	- /	j	- 1	Ϊ.	- 1	/	at least one time.
XXX	XXX	XXX	l											
XXX	XXX	XXX	1	'		1	•	•		r	1	•		
XXX	XXX	XXX	l											
XXX	XXX	XXX	5-	t .		:				•	•		•	
XXX	XXX	XXX	1											 Minimum voltage
XXX	XXX	XXX	1	i (i	- 1	i	- 1	i	- 1	1		ļ	should be below 0.30V
XXX	XXX	XXX	1	1 i	1	i	1	i	- !	j	1	i	1	at least one time.
XXX	XXX	XXX	1	1 1	1	- 1	1	!	١,	!	i i	1	i	
XXX	XXX	XXX	1	i /	ì	- 1	, i	. 1	į	- /	1	- /	Ţ	
XXX	XXX	XXX	1	W	١,	Ų.	١	V	,		`,	. /	Υ.	
XXX	XXX	XXX	1							Mini	mum	1		
XXX	XXX	XXX	1 _											
			0	•										SEF648Y

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 tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.

® Without CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- 2. Set voltmeter probes between ECM terminal 35 [HO2S1 (B1) signal] or 16 [HO2S1 (B2) signal] and engine ground.
- Check the following with engine speed held at 2,000 rpm constant under no load.
 - The voltage fluctuates between 0 to 0.3V and 0.6 to 1.0V more than 5 times within 10 seconds.
 - The maximum voltage is over 0.6V at least one time.
 - The minimum voltage is below 0.3V at least one time.
 - The voltage never exceeds 1.0V.

1 time: $0 - 0.3V \rightarrow 0.6 - 1.0V \rightarrow 0 - 0.3V$

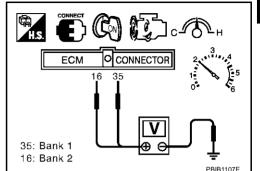
2 times: $0 - 0.3V \rightarrow 0.6 - 1.0V \rightarrow 0 - 0.3V \rightarrow 0.6 - 1.0V$

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 tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.

Removal and Installation HEATED OXYGEN SENSOR 1

Refer to EM-24, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .



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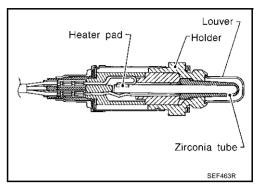
DTC P0133, P0153 HO2S1

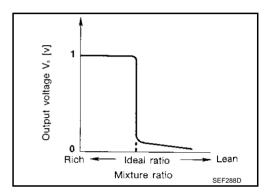
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Component Description

ABS00840

The heated oxygen sensor 1 is placed into the exhaust manifold. It detects the amount of oxygen in the exhaust gas compared to the outside air. The heated oxygen sensor 1 has a closed-end tube made of ceramic zirconia. The zirconia generates voltage from approximately 1V in richer conditions to 0V in leaner conditions. The heated oxygen sensor 1 signal is sent to the ECM. The ECM adjusts the injection pulse duration to achieve the ideal air-fuel ratio. The ideal air-fuel ratio occurs near the radical change from 1 to 0V.





CONSULT-II Reference Value in Data Monitor Mode

ABS00841

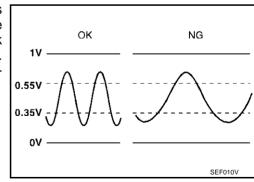
Specification data are reference values.

MONITOR ITEM	CON	SPECIFICATION	
HO2S1 (B1) HO2S1 (B2)	Engine: After warming up	Maintaining engine speed at 2,000 rpm	0 - 0.3V ←→ Approx. 0.6 - 1.0V
HO2S1 MNTR (B1) HO2S1 MNTR (B2)	Engine: After warming up	Maintaining engine speed at 2,000 rpm	LEAN ←→ RICH Changes more than 5 times during 10 seconds.

On Board Diagnosis Logic

ABS00842

To judge the malfunction of heated oxygen sensor 1, this diagnosis measures response time of heated oxygen sensor 1 signal. The time is compensated by engine operating (speed and load), fuel feedback control constant, and heated oxygen sensor 1 temperature index. Judgment is based on whether the compensated time (heated oxygen sensor 1 cycling time index) is inordinately long or not.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	
, ,		Harness or connectors (The sensor circuit is open or shorted)		
		Heated oxygen sensor 1Fuel pressure		
	, 0	ensor The response of the voltage signal from the	• Injectors	
	sensor takes more than the specified time.	Intake air leaks		
			Exhaust gas leaks	
			PCV valve	
			Mass air flow sensor	

DTC Confirmation Procedure

ABS00843

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

- Always perform at a temperature above –10°C (14°F).
- Before performing the following procedure, confirm that battery voltage is more than 11V at idle.

(A) WITH CONSULT-II

- Start engine and warm it up to normal operating temperature.
- Stop engine and wait at least 10 seconds.
- Turn ignition switch ON and select "HO2S1 (B1) P0133" or "HO2S1 (B2) P0153" of "HO2S1" in "DTC WORK SUPPORT" mode with CONSULT-II.
- Touch "START".
- 5. Start engine and let it idle for at least 3 minutes.

NOTE:

Never raise engine speed above 3,600 rpm after this step. If the engine speed limit is exceeded, return to step 5.

	HO2S1 (B1) P0	1133	
	OUT OF CONDI		
	MONITOR		
	ENG SPEED		
	B/FUEL SCHDL		
	COOLAN TEMP/S		
	VHCL SPEED SEN	XXX km/h	0550007
'			SEF338Z

6. When the following conditions are met, "TESTING" will be displayed on the CONSULT-II screen. Maintain the conditions continuously until "TESTING" changes to "COMPLETED". (It will take approximately 20 to 50 seconds.)

ENG SPEED	1,200 - 3,100 rpm
Vehicle speed	More than 80 km/h (50 MPH)
B/FUEL SCHDL	2.5 - 12.0 msec
Selector lever	Suitable position

If "TESTING" is not displayed after 5 minutes, retry from step 2.

HO2S1 (B1) P0	133	
TESTING		
MONITOR		
ENG SPEED		
B/FUEL SCHDL		
COOLAN TEMP/S		
VHCL SPEED SEN	055007	
-		SEF339Z

EC-861 Revision; 2004 April 2003 G35 Sedan

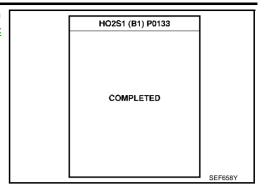
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 Make sure that "OK" is displayed after touching "SELF-DIAG RESULTS". If "NG" is displayed, refer to <u>EC-866, "Diagnostic</u> Procedure".



Overall Function Check

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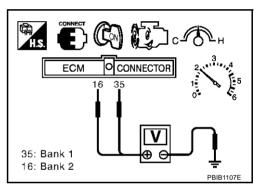
Use this procedure to check the overall function of the heated oxygen sensor 1 circuit. During this check, a DTC might not be confirmed.

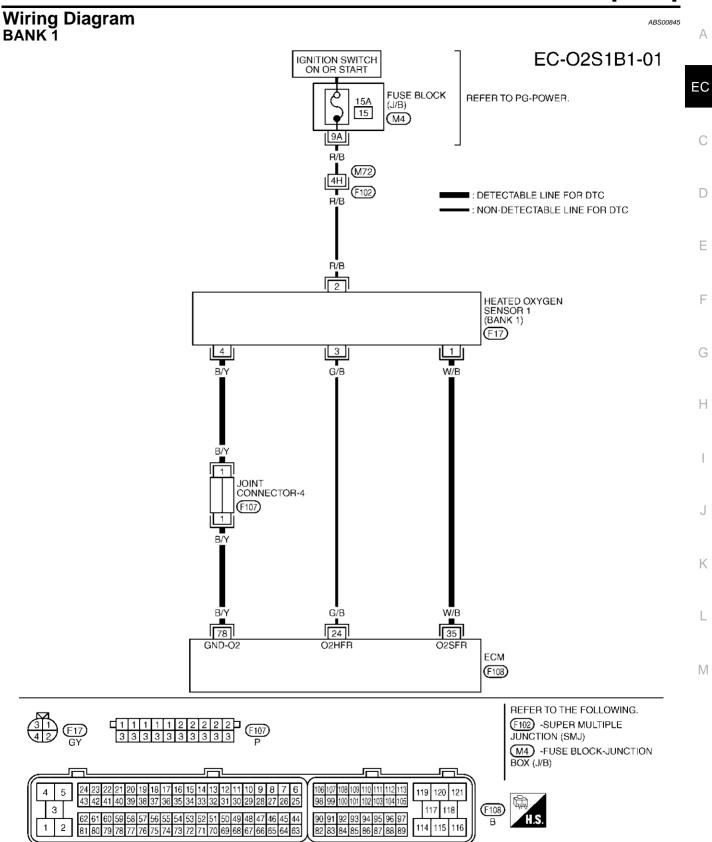
WITH GST

- 1. Start engine and warm it up to normal operating temperature.
- Set voltmeter probes between ECM terminal 35 [HO2S1(B1) signal] or 16 [HO2S1(B2) signal] and engine ground.
- 3. Check the following with engine speed held at 2,000 rpm constant under no load.
- The voltage fluctuates between 0 to 0.3V and 0.6 to 1.0V more than 5 times within 10 seconds.

1 time: $\begin{array}{ll} \text{0 - 0.3V} \rightarrow \text{0.6 - 1.0V} \rightarrow \text{0 - 0.3V} \\ \text{2} & \text{0 - 0.3V} \rightarrow \text{0.6 - 1.0V} \rightarrow \text{0 - 0.3V} \rightarrow \text{0.6 - 1.0V} \\ \text{times:} & \rightarrow \text{0 - 0.3V} \end{array}$

4. If NG, go to EC-866, "Diagnostic Procedure".





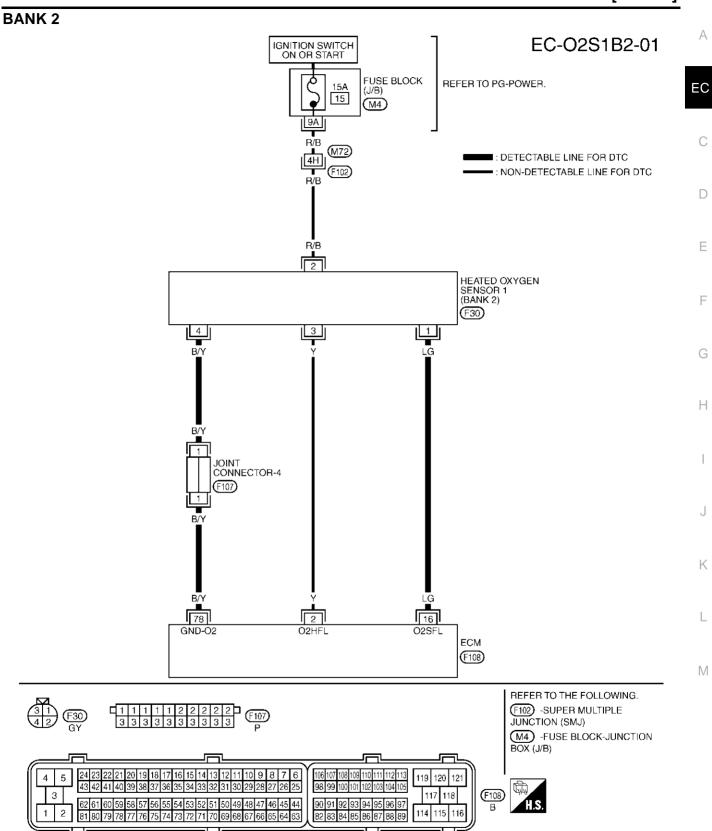
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Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
35	W/B	Heated oxygen sensor 1 (bank 1)	[Engine is running]Warm-up conditionEngine speed is 2,000 rpm.	0 - Approximately 1.0V (Periodically change)
78	B/Y	Sensors' ground (Heated oxygen sensor)	[Engine is running] • Warm-up condition • Idle speed	Approximately 0V



TBWT0266E

ABS00846

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

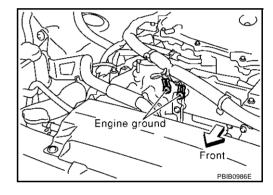
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
16	LG	Heated oxygen sensor 1 (bank 2)	[Engine is running]Warm-up conditionEngine speed is 2,000 rpm.	0 - Approximately 1.0V (Periodically change)
78	B/Y	Sensors' ground (Heated oxygen sensor)	[Engine is running]Warm-up conditionIdle speed	Approximately 0V

Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

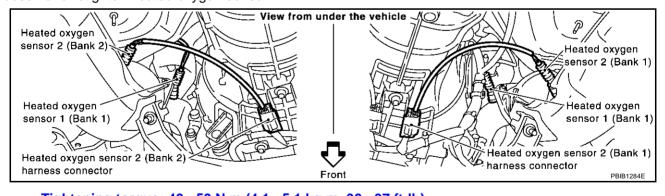
- 1. Turn ignition switch OFF.
- 2. Loosen and retighten engine ground screws.

>> GO TO 2.



2. RETIGHTEN HEATED OXYGEN SENSOR 1

Loosen and retighten heated oxygen sensor 1.

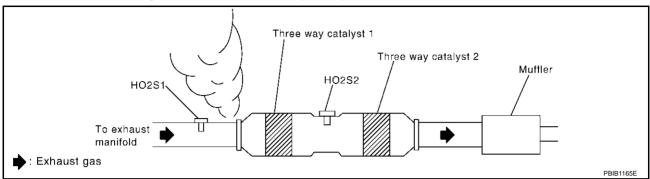


Tightening torque: 40 - 50 N·m (4.1 - 5.1 kg-m, 30 - 37 ft-lb)

>> GO TO 3.

3. CHECK FOR EXHAUST GAS LEAK

- 1. Start engine and run it at idle.
- 2. Listen for an exhaust gas leak before three way catalyst 1.



OK or NG

OK >> GO TO 4.

NG >> Repair or replace.

4. CHECK FOR INTAKE AIR LEAK

Listen for an intake air leak after the mass air flow sensor.

OK or NG

OK >> GO TO 5.

NG >> Repair or replace.

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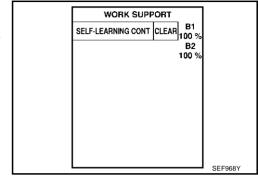
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5. CLEAR THE SELF-LEARNING DATA

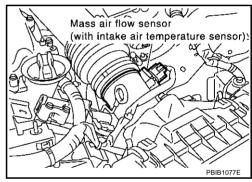
(P) With CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- 2. Select "SELF-LEARNING CONT" in "WORK SUPPORT" mode with CONSULT-II.
- Clear the self-learning control coefficient by touching "CLEAR".
- 4. 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?



(R) Without CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- 2. Turn ignition switch OFF.
- 3. Disconnect mass air flow sensor harness connector, and restart and run engine for at least 5 seconds at idle speed.
- Stop engine and reconnect mass air flow sensor harness connector.
- 5. Make sure DTC P0102 is displayed.
- Erase the DTC memory. Refer to <u>EC-710, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION"</u>.
- 7. Make sure DTC P0000 is displayed.
- 8. 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?



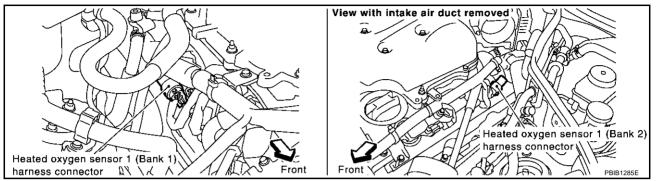
Yes or No

Yes >> Perform trouble diagnosis for DTC P0171, P0174 or DTC P0172, P0175 (Refer to $\underline{\text{EC-905}}$ or $\underline{\text{EC-905}}$).

No >> GO TO 6.

6. CHECK HO2S1 GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Disconnect heated oxygen sensor 1 harness connector.



 Check harness continuity between HO2S1 terminal 4 and ECM terminal 78. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 8. NG >> GO TO 7.

7. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-4
- Harness for open or short between HO2S1 and ECM

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

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8. CHECK HO2S1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

 Check harness continuity between ECM terminal and HO2S1 terminal as follows. Refer to Wiring Diagram.

DTC	Tern	Bank	
ыс	ECM	Sensor	Dalik
P0133	35	1	1
P0153	16	1	2

Continuity should exist.

2. Check harness continuity between the following terminals and ground. Refer to Wiring Diagram.

DTC	Tern	Bank	
DIC	ECM	Sensor	Dalik
P0133	35	1	1
P0153	16	1	2

Continuity should not exist.

Also check harness for short to power.

OK or NG

NG

OK >> GO TO 9

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

9. CHECK MASS AIR FLOW SENSOR

Refer to EC-824, "Component Inspection".

OK or NG

OK >> GO TO 10.

NG >> Replace mass air flow sensor.

10. CHECK PCV VALVE

Refer to EC-1305, "Component Inspection".

OK or NG

OK >> GO TO 11.

NG >> Replace PCV valve.

11. CHECK HEATED OXYGEN SENSOR 1

Refer to EC-870, "Component Inspection".

OK or NG

OK >> GO TO 12.

NG >> Replace malfunctioning heated oxygen sensor 1.

12. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> INSPECTION END

Component Inspection HEATED OXYGEN SENSOR 1

With CONSULT-II

1. Start engine and warm it up to normal operating temperature.

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- 2. Select "MANU TRIG" and adjust "TRIGGER POINT" to 100% in "DATA MONITOR" mode with CONSULT-II.
- 3. Select "HO2S1 (B1)/(B2)" and "HO2S1 MNTR (B1)/(B2)".
- 4. Hold engine speed at 2,000 rpm under no load during the following steps.
- 5. Touch "RECORD" on CONSULT-II screen.

DATA MONITOR								
MONITOR	NO DTC							
ENG SPEED	XXX rpm							
MAS A/F SE-B1	XXX V							
COOLAN TEMP/S	XXX .C							
HO2S1 (B1)	XXX V							
HO2S1 MNTR (B1)	LEAN							

- 6. Check the following.
 - "HO2S1 MNTR (B1)/(B2)" in "DATA MONITOR" mode changes from "RICH" to "LEAN" to "RICH" 5 times in 10 seconds.
 - 5 times (cycles) are counted as shown at right.
 - "HO2S1 (B1)/(B2)" voltage goes above 0.6V at least once.
 - "HO2S1 (B1)/(B2)" voltage goes below 0.3V at least once.
 - "HO2S1 (B1)/(B2)" voltage never exceeds 1.0V.

r		
Bank 1		
	cycle 1	2 3 4 5
HO2S1	MNTR (B1) R-L-	R-L-R-L-R-L-R
Bank 2		
	cycle 1	2 3 4 5
HO2S1	MNTR (B2) R-L-	-R-L-R-L-R-L-R
R means	HO2S1	
MNTR (B1)/(B2) indicates F	RICH
L means l	HO2S1	
MNTR (B1)/(B2) indicates L	_EAN SEF647Y

Trigger	ENG SPEED	HO2S1 (B1)		128		, I	Maxir	num	1	,	· <u> </u>	,	~ <u>.</u>		∽ .	Maximum voltage
	rpm	v	1			į-\	1	- /	À	1	- 1	į	<i>\</i>	- 1	- /	should be over 0.6V at least one time.
XXX	XXX	XXX	1			•		•	•	,	•	•	•		•	at least one time.
XXX	XXX	XXX	1			1		1	1	•		r	1	•		
XXX	XXX	XXX	1													
XXX	XXX	XXX	1	-64	<u> </u>		1	2	- 1	1	1	•	•			
XXX	XXX	XXX	1	-	Ι.			_								 Minimum voltage
XXX	XXX	XXX	1		j		i	1	i	- 1	i	- 1	. !	- 1	ļ	should be below 0.30V
XXX	XXX	XXX	1		1 1		!	i	1	i	- !	i	- 1	i	1	at least one time.
XXX	XXX	XXX	1		11 - 1		i	!	i	!	i	- !	i	- !	i	
XXX	XXX	XXX	1		1 /		À	/	, į	- 1	Ì		١	. /	į	
XXX	XXX	XXX	1					7	١,	Ų.		`e'		V	,_	
XXX	XXX	XXX]									Min	imur	n		
XXX	XXX	XXX]													
			_	0												SEF648Y

CAUTION:

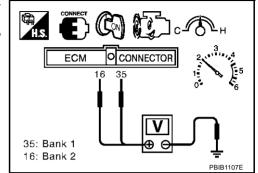
- Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread
 Cleaner tool J-43897-18 or J-43897-12 and approved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

N Without CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- 2. Set voltmeter probes between ECM terminal 35 [HO2S1 (B1) signal] or 16 [HO2S1 (B2) signal] and engine ground.
- Check the following with engine speed held at 2,000 rpm constant under no load.
 - The voltage fluctuates between 0 to 0.3V and 0.6 to 1.0V more than 5 times within 10 seconds.
 - The maximum voltage is over 0.6V at least one time.
 - The minimum voltage is below 0.3V at least one time.
 - The voltage never exceeds 1.0V.

1 time: $0 - 0.3V \rightarrow 0.6 - 1.0V \rightarrow 0 - 0.3V$

2 times: 0 - 0.3V \rightarrow 0.6 - 1.0V \rightarrow 0 - 0.3V \rightarrow 0.6 - 1.0V



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 tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.

Removal and Installation HEATED OXYGEN SENSOR 1

ABS00848

Refer to EM-24, "EXHAUST MANIFOLD AND THREE WAY CATALYST".

DTC P0134, P0154 HO2S1

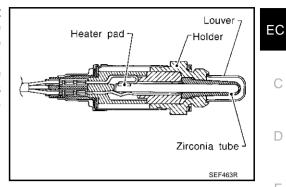
PFP:22690

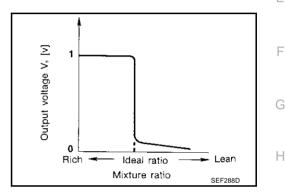
Component Description

ABS00849

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The heated oxygen sensor 1 is placed into the exhaust manifold. It detects the amount of oxygen in the exhaust gas compared to the outside air. The heated oxygen sensor 1 has a closed-end tube made of ceramic zirconia. The zirconia generates voltage from approximately 1V in richer conditions to 0V in leaner conditions. The heated oxygen sensor 1 signal is sent to the ECM. The ECM adjusts the injection pulse duration to achieve the ideal air-fuel ratio. The ideal air-fuel ratio occurs near the radical change from 1 to 0V.





CONSULT-II Reference Value in Data Monitor Mode

ABS0084A

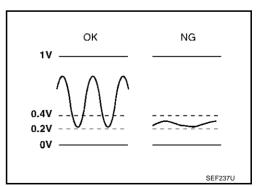
Specification data are reference values.

MONITOR ITEM	CON	NDITION	SPECIFICATION
HO2S1 (B1) HO2S1 (B2)	Engine: After warming up	Maintaining engine speed at 2,000 rpm	0 - 0.3V ←→ Approx. 0.6 - 1.0V
HO2S1 MNTR (B1) HO2S1 MNTR (B2)	Engine: After warming up	Maintaining engine speed at 2,000 rpm	LEAN ←→ RICH Changes more than 5 times during 10 seconds.

On Board Diagnosis Logic

ABS0084B

Under the condition in which the heated oxygen sensor 1 signal is not input, the ECM circuits will read a continuous approximately 0.3V. Therefore, for this diagnosis, the time that output voltage is within 200 to 400 mV range is monitored, and the diagnosis checks that this time is not inordinately long.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0134 0134 (Bank 1) P0154 0154 (Bank 2)	Heated oxygen sensor 1 circuit no activity detected	The voltage from the sensor is constantly approx. 0.3V.	Harness or connectors (The sensor circuit is open or shorted) Heated oxygen sensor 1

DTC Confirmation Procedure

ABS0084C

CAUTION:

Always drive vehicle at a safe speed.

NOTE

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 11V at idle.

(P) WITH CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- 2. Select "HO2S1 (B1) P0134" or "HO2S1 (B2) P0154" of "HO2S1" in "DTC WORK SUPPORT" mode with CONSULT-II.
- 3. Touch "START".
- Let it idle for at least 3 minutes.

NOTE:

Never raise engine speed above 3,600 rpm after this step. If the engine speed limit is exceeded, return to step 4.

HO2S1 (B1) PC	1134	
OUT OF CONDI		
MONITOR		
ENG SPEED		
B/FUEL SCHDL		
COOLAN TEMP/S		
VHCL SPEED SEN	DDIDO544E	
		PBIB0544E

When the following conditions are met, "TESTING" will be displayed on the CONSULT-II screen. Maintain the conditions continuously until "TESTING" changes to "COMPLETED". (It will take approximately 10 to 60 seconds.)

ENG SPEED	1,400 - 2,600 rpm
Vehicle speed	More than 64 km/h (40 MPH)
B/FUEL SCHDL	2.0 - 12.0 msec
Selector lever	Suitable position

If "TESTING" is not displayed after 5 minutes, retry from step 2.

 Make sure that "OK" is displayed after touching "SELF-DIAG RESULTS". If "NG" is displayed, refer to EC-879, "Diagnostic Procedure".

HO2S1 (B1) P0		
TESTING		
MONITOR		
ENG SPEED		
B/FUEL SCHOL		
COOLAN TEMP/S		
VHCL SPEED SEN	PBIB0545E	

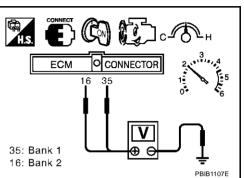
Overall Function Check

200840

Use this procedure to check the overall function of the heated oxygen sensor 1 circuit. During this check, a DTC might not be confirmed.

WITH GST

- 1. Start engine and warm it up to normal operating temperature.
- Set voltmeter probes between ECM terminal 35 [HO2S1 (B1) signal] or 16 [HO2S1 (B2) signal] and engine ground.
- 3. Check the following with engine speed held at 2,000 rpm constant under no load.
- The voltage does not remain in the range of 0.2 to 0.4V.
- 4. If NG, go to EC-879, "Diagnostic Procedure".



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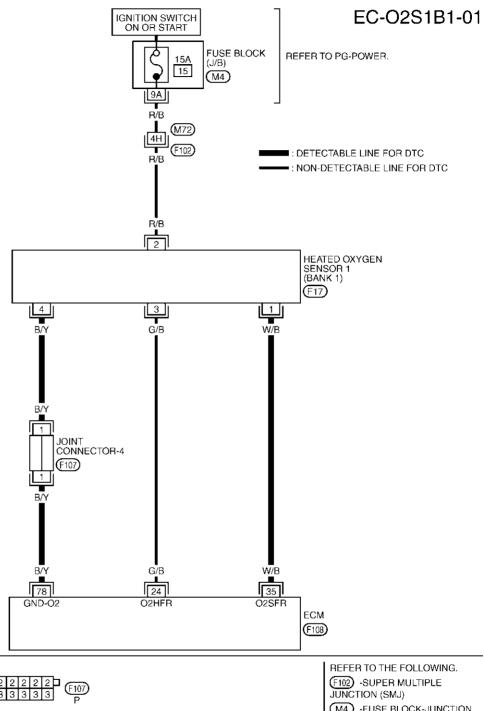
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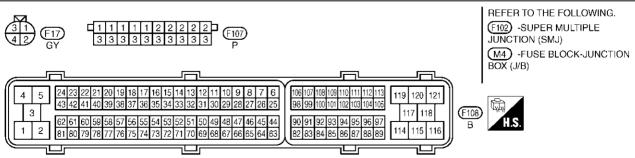
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ABS0084E

Wiring Diagram
BANK 1





TBWT0414E

DTC P0134, P0154 HO2S1

[TYPE 2]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
35	W/B	Heated oxygen sensor 1 (bank 1)	[Engine is running]Warm-up conditionEngine speed is 2,000 rpm.	0 - Approximately 1.0V (Periodically change)
78	B/Y	Sensors' ground (Heated oxygen sensor)	[Engine is running]Warm-up conditionIdle speed	Approximately 0V

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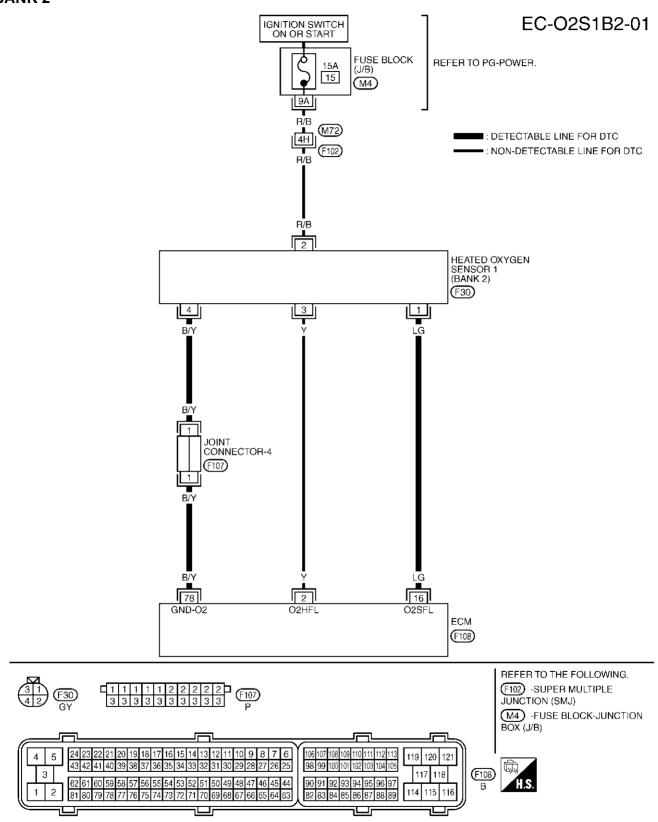
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BANK 2



TBWT0266E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

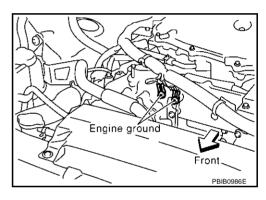
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
16	LG	Heated oxygen sensor 1 (bank 2)	[Engine is running]Warm-up conditionEngine speed is 2,000 rpm.	0 - Approximately 1.0V (Periodically change)
78	B/Y	Sensors' ground (Heated oxygen sensor)	[Engine is running] • Warm-up condition • Idle speed	Approximately 0V

Diagnostic Procedure

1. INSPECTION START

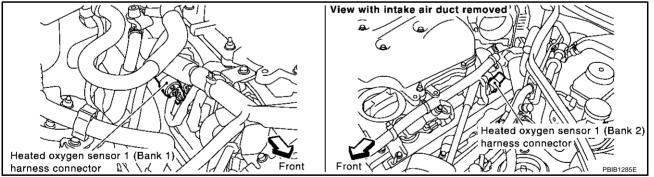
- 1. Turn ignition switch OFF.
- 2. Loosen and retighten engine ground screws.

>> GO TO 2.



2. CHECK HO2S1 GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Disconnect ECM harness connector.
- 2. Disconnect heated oxygen sensor 1 harness connector.



Check harness continuity between HO2S1 terminal 4 and ECM terminal 78. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 4. NG >> GO TO 3.

Revision; 2004 April EC-879 2003 G35 Sedan

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$\overline{3}$. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-4
- Harness for open or short between HO2S1 and ECM
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK HO2S1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

 Check harness continuity between ECM terminal and HO2S1 terminal as follows. Refer to Wiring Diagram.

DTC	Term	Bank		
DIC	ECM	Sensor	Dalik	
P0134	35	1	1	
P0154	16	1	2	

Continuity should exist.

2. Check harness continuity between the following terminals and ground. Refer to Wiring Diagram.

DTC	Term	Bank		
DIO	ECM	Sensor	Dalik	
P0134	35	1	1	
P0154	16	1	2	

Continuity should not exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 5.

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

5. CHECK HEATED OXYGEN SENSOR 1

Refer to EC-880, "Component Inspection".

OK or NG

OK >> GO TO 6.

NG >> Replace malfunctioning heated oxygen sensor 1.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

Component Inspection HEATED OXYGEN SENSOR 1

ABS0084G

(P) With CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- 2. Select "MANU TRIG" and adjust "TRIGGER POINT" to 100% in "DATA MONITOR" mode with CONSULT-II.
- 3. Select "HO2S1 (B1)/(B2)" and "HO2S1 MNTR (B1)/(B2)".
- 4. Hold engine speed at 2,000 rpm under no load during the following steps.

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Touch "RECORD" on CONSULT-II screen.

		ı
DATA MON		
MONITOR	NO DTC	
ENG SPEED	XXX rpm	
MAS A/F SE-B1	xxx v	
COOLAN TEMP/S	XXX .C	
HO2S1 (B1)	XXX V	
HO2S1 MNTR (B1)	LEAN	
		SEF646Y

- Check the following.
 - "HO2S1 MNTR (B1)/(B2)" in "DATA MONITOR" mode changes from "RICH" to "LEAN" to "RICH" 5 times in 10 seconds.
 - 5 times (cycles) are counted as shown at right.
 - "HO2S1 (B1)/(B2)" voltage goes above 0.6V at least once.
 - "HO2S1 (B1)/(B2)" voltage goes below 0.3V at least once.
 - "HO2S1 (B1)/(B2)" voltage never exceeds 1.0V.

Bank 1 cycle 1 2 3 4 5 HO2S1 MNTR (B1) R-L-R-L-R-L-R-L-R Bank 2 cycle 1 2 3 4 5 HO2S1 MNTR (B2) R-L-R-L-R-L-R-L-R-L-R B means HO2S1						
HO2S1 MNTR (B1) R-L-R-L-R-L-R-L-R Bank 2 cycle 1 2 3 4 5 HO2S1 MNTR (B2) R-L-R-L-R-L-R-L-R						
Bank 2 cycle 1 2 3 4 5 HO2S1 MNTR (B2) R-L-R-L-R-L-R-L-R						
cycle 1 2 3 4 5 HO2S1 MNTR (B2) R-L-R-L-R-L-R-L-R						
HO2S1 MNTR (B2) R-L-R-L-R-L-R-L-R						
, ,						
R means HO2S1						
TO MISSING TIGEST						
MNTR (B1)/(B2) indicates RICH						
L means HO2S1						
MNTR (B1)/(B2) indicates LEAN SEF647Y						

Trigger	ENG SPEED	HO2S1 (B1)		128		4	Ма	ximur	n		<u>ر</u>	,	_	,-	,	Maximum voltage
ŀ	rpm	V	ł			Γ	٦\	- 1	`\			- /	\	- <i>f</i> -	\	should be over 0.6V at least one time.
XXX	ХХХ	XXX	1			'	•		•	,	•	•	•			at least one time.
XXX	XXX	XXX	1					- 1	•			r	•	•		
XXX	XXX	XXX	1													
XXX	XXX	XXX	1	- 64	ł	•	- 1	:	- 1	•	1	•	•		•	
XXX	XXX	XXX	1	-	ł.	_										 Minimum voltage
XXX	XXX	XXX	1		Ī	- [i	- 1	i	- 1	i	- 1	1	- 1	į	should be below 0.30V
XXX	XXX	XXX	1		ļ.	i	•	i	1	i	- 1	i	1	i	1	at least one time.
XXX	XXX	XXX	l		ľ	1	i	!	i	!	i	- !	į.	!	i	
XXX	XXX	XXX	l		١	1	Ì	- /	Ŋ	. /	1	i .	'	i	,	
XXX	XXX	XXX	l		1	į	,	Ú.		./	,	•	` '	./	`_	
XXX	XXX	XXX	1									~ Min	imum			
XXX	XXX	XXX	I	0-												

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 tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.

⋈ Without CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- Set voltmeter probes between ECM terminal 35 [HO2S1 (B1) signal] or 16 [HO2S1 (B2) signal] and engine ground.
- Check the following with engine speed held at 2,000 rpm constant under no load.
 - The voltage fluctuates between 0 to 0.3V and 0.6 to 1.0V more than 5 times within 10 seconds.
 - The maximum voltage is over 0.6V at least one time.
 - The minimum voltage is below 0.3V at least one time.
 - The voltage never exceeds 1.0V.

1 time: 0 - 0.3V \to 0.6 - 1.0V \to 0 - 0.3V 2 times: 0 - 0.3V \to 0.6 - 1.0V \to 0 - 0.3V \to 0.6 - 1.0V

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.

ECM OCONNECTOR

16 35

35: Bank 1
16: Bank 2

DTC P0134, P0154 HO2S1

[TYPE 2]

 Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.

Removal and Installation HEATED OXYGEN SENSOR 1

ABS0084H

Refer to EM-24, "EXHAUST MANIFOLD AND THREE WAY CATALYST".

DTC P0138, P0158 HO2S2

Component Description

PFP:226A0

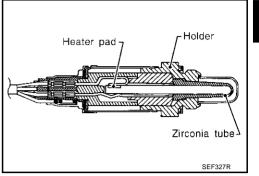
ABS0084I

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 heated oxygen 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 1V in richer conditions to 0V in leaner conditions.

Under normal conditions the heated oxygen sensor 2 is not used for engine control operation.



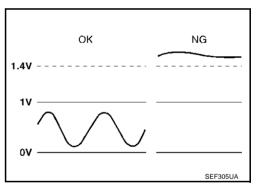
CONSULT-II Reference Value in Data Monitor Mode

Specification data are reference values.

MONITOR ITEM	CON	IDITION	SPECIFICATION
HO2S2 (B1) HO2S2 (B2)	Warm-up condition After keeping engine speed	Revving engine from idle to 3,000 rpm	0 - 0.3V ←→ Approx. 0.6 - 1.0V
HO2S2 MNTR (B1) HO2S2 MNTR (B2)	between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	quickly.	$LEAN \longleftrightarrow RICH$

On Board Diagnosis Logic

The heated oxygen sensor 2 has a much longer switching time between rich and lean than the heated oxygen sensor 1. The oxygen storage capacity before the three way catalyst causes the longer switching time. To judge the malfunctions of heated oxygen sensor 2, ECM monitors whether the voltage is unusually high during the various driving condition such as fuel-cut.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0138 0138 (Bank 1)	Heated oxygen sensor	An excessively high voltage from the sensor is	Harness or connectors (The sensor circuit is open or shorted)
P0158 0158 (Bank 2)	2 circuit high voltage	sent to ECM.	Heated oxygen sensor 2

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DTC Confirmation Procedure

CAUTION:

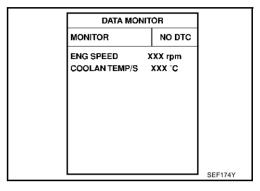
Always drive vehicle at a safe speed.

NOTE

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

(P) WITH CONSULT-II

- 1. Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-II.
- 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.
- 5. Let engine idle for 2 minutes.
- 6. If 1st trip DTC is detected, go to EC-888, "Diagnostic Procedure"



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.
- 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 2 minutes.
- 5. Turn ignition switch OFF and wait at least 10 seconds.
- 6. 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 2 minutes.
- 8. Select "Mode 3" with GST.
- 9. If DTC is detected, go to EC-888, "Diagnostic Procedure".

Wiring Diagram BANK 1 ABS0084M Α EC-O2S2B1-01 IGNITION SWITCH ON OR START EC FUSE BLOCK REFER TO PG-POWER. (J/B) 15 (M4)4H : DETECTABLE LINE FOR DTC D R/B (F102) : NON-DETECTABLE LINE FOR DTC Е HEATED OXYGEN SENSOR 2 (BANK 1) (F11) G 4 3 P/B B/Y ĽΒ Н JOINT CONNECTOR-4 (F107) 78 74 GND-02 02SRR 02HRR ЕСМ M (F108) REFER TO THE FOLLOWING. (F102) -SUPER MULTIPLE JUNCTION (SMJ) M4) -FUSE BLOCK-JUNCTION BOX (J/B) 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 106 107 108 109 110 111 112 113 119 120 3 117 (F108) 81 80 79 78 77 76 75 74 73 72 71 70 69 68 67 66 65 64 63

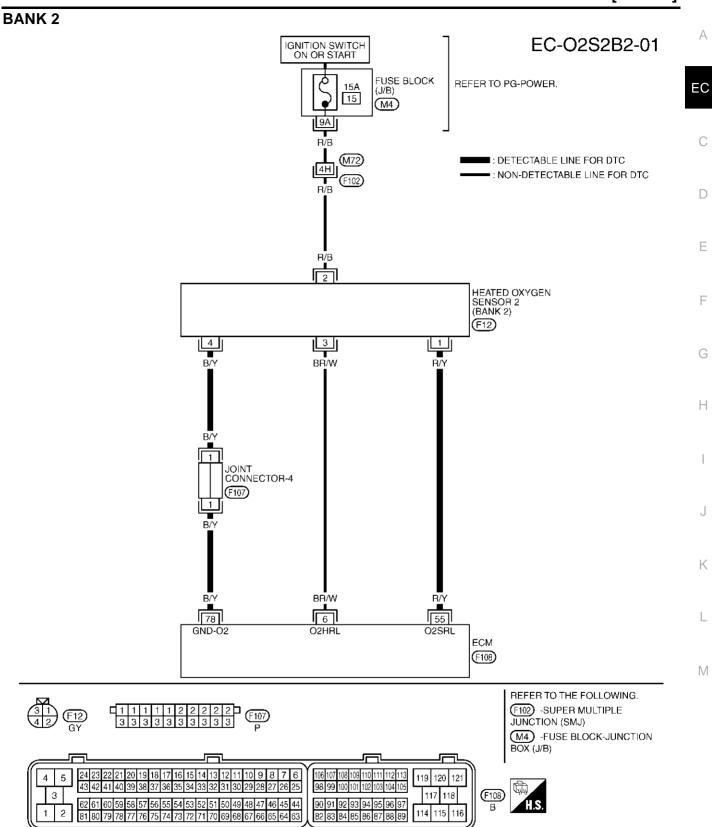
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Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
74	L/B	Heated oxygen sensor 2 (bank 1)	 [Engine is running] Warm-up condition Revving engine from idle to 3,000 rpm quickly after the following conditions are met. After keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load. 	0 - Approximately 1.0V
78	B/Y	Sensors' ground (Heated oxygen sensor)	[Engine is running] • Warm-up condition • Idle speed	Approximately 0V



TBWT0268E

ABS0084N

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
55	R/Y	Heated oxygen sensor 2 (bank 2)	 [Engine is running] Warm-up condition Revving engine from idle to 3,000 rpm quickly after the following conditions are met. After keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load. 	0 - Approximately 1.0V
78	B/Y	Sensors' ground (Heated oxygen sensor)	[Engine is running]Warm-up conditionIdle speed	Approximately 0V

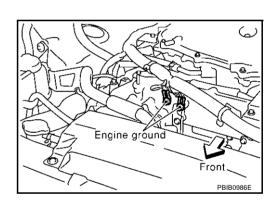
Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

1. Turn ignition switch OFF.

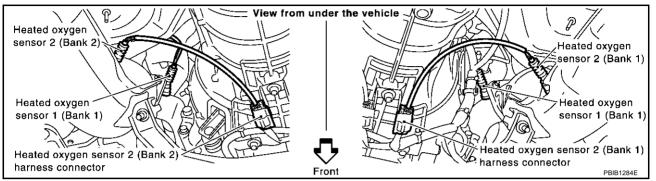
2. Loosen and retighten engine ground screws.

>> GO TO 2.



$\overline{2}$. CHECK H02S2 GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Disconnect heated oxygen sensor 2 harness connector.



 Check harness continuity between HO2S2 terminal 4 and ECM terminal 78. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 4. NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-4
- Harness for open or short between HO2S2 and ECM

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

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4. CHECK HO2S2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

 Check harness continuity between ECM terminal and HO2S2 terminal as follows. Refer to Wiring Diagram.

DTC	Term	Bank		
DIC	ECM	Sensor	Dalik	
P0138	74	1	1	
P0158	55	1	2	

Continuity should exist.

2. Check harness continuity between the following terminals and ground. Refer to Wiring Diagram.

DTC	Terminals		Bank	
DIC	ECM	Sensor	Dalik	
P0138	74	1	1	
P0158	55	1	2	

Continuity should not exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 5.

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

5. CHECK HO2S2 CONNECTOR FOR WATER

- 1. Turn ignition switch OFF.
- 2. Disconnect heated oxygen sensor 2 harness connector.
- Check connectors for water.

Water should not exist.

OK or NG

OK >> GO TO 6.

NG >> Repair or replace harness or connectors.

6. CHECK HEATED OXYGEN SENSOR 2

Refer to EC-891, "Component Inspection".

OK or NG

OK >> GO TO 7.

NG >> Replace malfunctioning heated oxygen sensor 2.

7. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

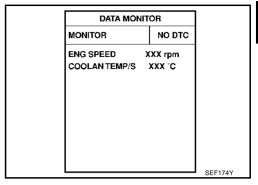
>> INSPECTION END

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Component Inspection HEATED OXYGEN SENSOR 2

(P) With CONSULT-II

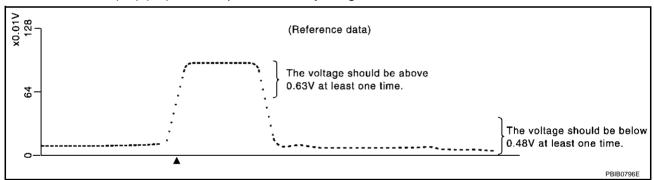
- Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-II.
- 2. Start engine and warm it up to the normal operating tempera-
- Turn ignition switch OFF and wait at least 10 seconds. 3.
- Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- Let engine idle for 1 minutes.



Select "FUEL INJECTION" in "ACTIVE TEST" mode, and select "HO2S2 (B1)/(B2)" as the monitor item with CONSULT-II.

ACTIVE TEST		
FUEL INJECTION 25 %		
MONITOR		
ENG SPEED	XXX rpm	
HO2S1 (B1)	XXX V	
HO2S2 (B1)	XXX V	
HO2S1 MNTR (B1)	RICH	
HO2S2 MNTR (B1)	RICH	
		SFF662Y

Check "HO2S2 (B1)/(B2)" at idle speed when adjusting "FUEL INJECTION" to ±25%.



"HO2S2 (B1)/(B2)" should be above 0.63V at least once when the "FUEL INJECTION" is +25%. "HO2S2 (B1)/(B2)" should be below 0.48V at least once when the "FUEL INJECTION" is -25%.

- 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 tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.

₩ Without CONSULT-II

- 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. 3.
- Let engine idle for 1 minutes.
- Set voltmeter probes between ECM terminal 74 [HO2S2 (B1) signal] or 55 [HO2S2 (B2) signal] and engine ground.

EC-891 Revision; 2004 April 2003 G35 Sedan

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CONNECTOR

ECM

74. Bank 1

55: Bank 2

- 6. Check the voltage when revving up to 4,000 rpm under no load at least 10 times.
 - (Depress and release accelerator pedal as soon as possible.) The voltage should be above 0.63V at least once during this procedure.
 - If the voltage is above 0.63V at step 6, step 7 is not necessary.
- 7. Keep vehicle at idling for 10 minutes, then check voltage. Or check the voltage when coasting from 80 km/h (50 MPH) in D (A/T), 4th (M/T) gear position.
 - The voltage should be below 0.48V at least once during this procedure.
- 8. If NG, replace 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 tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.

Removal and Installation HEATED OXYGEN SENSOR 2

ABS0084F

PBIB1607E

Refer to EM-24, "EXHAUST MANIFOLD AND THREE WAY CATALYST".

PFP:226A0

ABS00840

DTC P0139, P0159 HO2S2

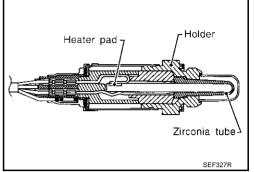
Component Description

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 heated oxygen 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 1V in richer conditions to 0V in leaner conditions.

Under normal conditions the heated oxygen sensor 2 is not used for engine control operation.



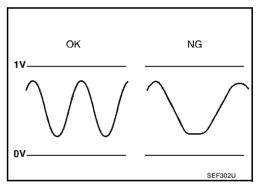
CONSULT-II Reference Value in Data Monitor Mode

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
HO2S2 (B1) HO2S2 (B2)	Warm-up conditionAfter keeping engine speed	Revving engine from idle to 3,000 rpm	0 - 0.3V ←→ Approx. 0.6 - 1.0V
HO2S2 MNTR (B1) HO2S2 MNTR (B2)	between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	quickly.	$LEAN \longleftrightarrow RICH$

On Board Diagnosis Logic

The heated oxygen sensor 2 has a much longer switching time between rich and lean than the heated oxygen sensor 1. The oxygen storage capacity before the three way catalyst 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 the various driving condition such as fuel-cut.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0139 0139 (Bank 1)	Heated oxygen sensor 2 circuit slow response	It takes more time for the sensor to respond between rich and lean than the specified time.	Harness or connectors (The sensor circuit is open or shorted) Heated oxygen sensor 2
P0159 0159 (Bank 2)			Fuel pressureInjectorsIntake air leaks

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DTC Confirmation Procedure

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NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

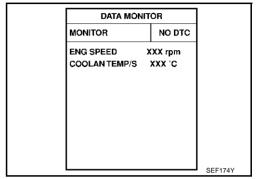
(P) WITH CONSULT-II

TESTING CONDITION:

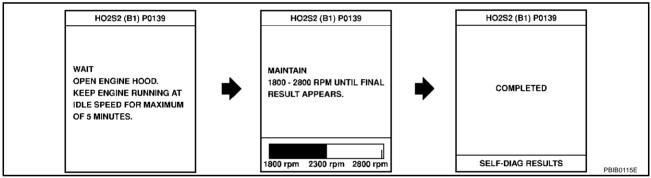
For better results, perform "DTC WORK SUPPORT" at a temperature of 0 to 30 °C (32 to 86 °F).

- Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-II.
- 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.
- 5. Let engine idle for 1 minutes.
- 6. 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).



- Select "HO2S2 (B1) P0139" or "HO2S2 (B2) P0159" of "HO2S2" in "DTC WORK SUPPORT" mode with CONSULT-II.
- 8. Start engine and following the instruction of CONSULT-II.



- 9. Make sure that "OK" is displayed after touching "SELF-DIAG RESULTS".
 - If "NG" is displayed, refer to EC-899, "Diagnostic Procedure".
 - If "CAN NOT BE DIAGNOSED" is displayed, perform the following.
- Turn ignition switch OFF and leave the vehicle in a cool place (soak the vehicle).
- b. Return to step 1.

Overall Function Check

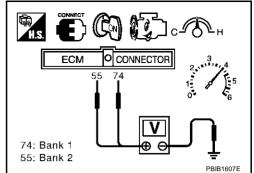
ABS0084U

Use this procedure to check the overall function of the heated oxygen sensor 2 circuit. During this check, a DTC might not be confirmed.

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 minutes.
- 5. Set voltmeter probes between ECM terminal 74 [HO2S2 (B1) signal] or 55 [HO2S2 (B2) signal] and engine ground.

- 6. Check the voltage when revving up to 4,000 rpm under no load at least 10 times.
 - (Depress and release accelerator pedal as soon as possible.) A change of voltage should be more than 0.06V for 1 second during this procedure.
 - If the voltage can be confirmed in step 6, step 7 is not necessary.
- 7. Keep vehicle at idling for 10 minutes, then check the voltage. Or check the voltage when coasting from 80 km/h (50 MPH) in D (A/T), 4th gear position (M/T).
 - A change of voltage should be more than 0.06V for 1 second during this procedure.
- 8. If NG, go to EC-899, "Diagnostic Procedure".



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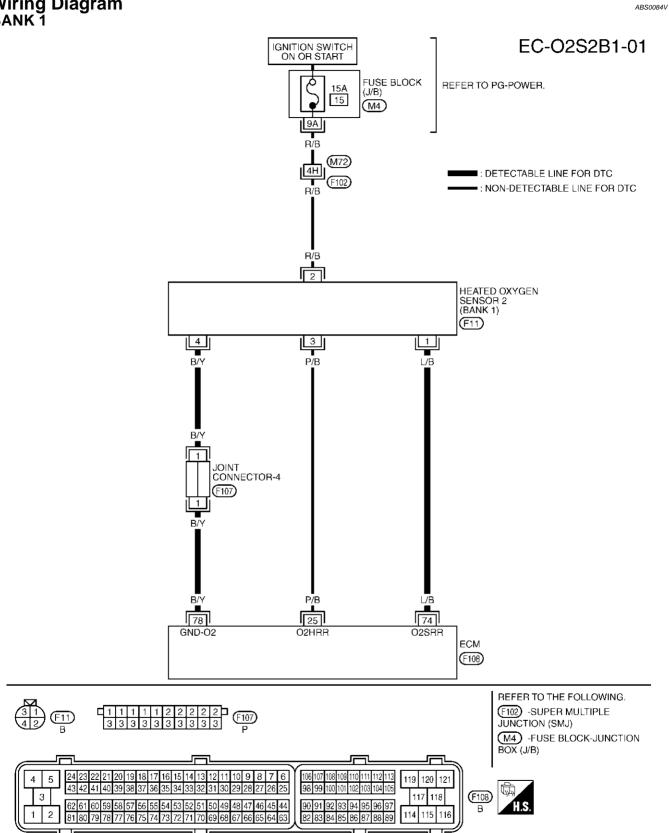
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Wiring Diagram BANK 1



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DTC P0139, P0159 HO2S2

[TYPE 2]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
74	L/B	Heated oxygen sensor 2 (bank 1)	 [Engine is running] Warm-up condition Revving engine from idle to 3,000 rpm quickly after the following conditions are met. After keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load. 	0 - Approximately 1.0V
78	B/Y	Sensors' ground (Heated oxygen sensor)	[Engine is running]Warm-up conditionIdle speed	Approximately 0V

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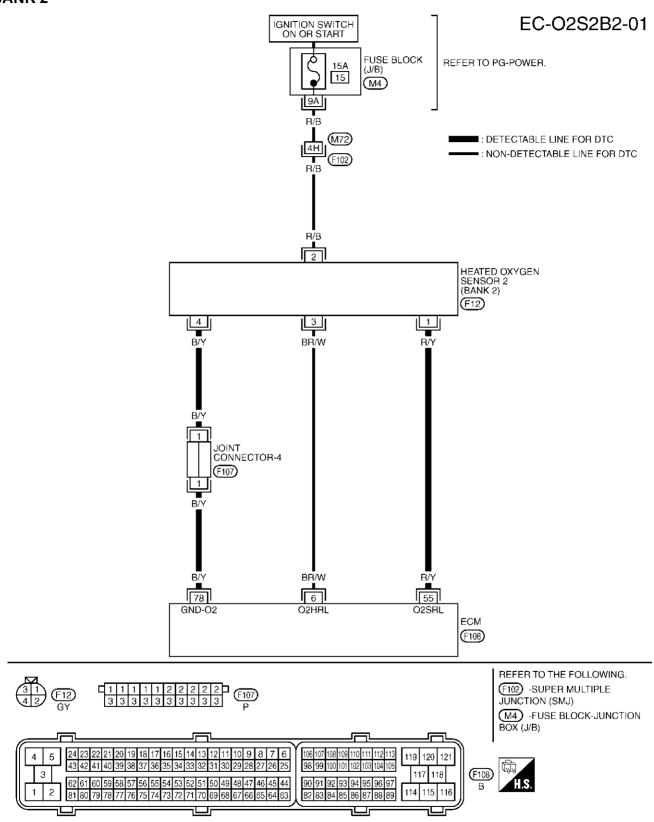
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BANK 2



TBWT0268E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
55	R/Y	Heated oxygen sensor 2 (bank 2)	 [Engine is running] Warm-up condition Revving engine from idle to 3,000 rpm quickly after the following conditions are met. After keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load. 	0 - Approximately 1.0V
78	B/Y	Sensors' ground (Heated oxygen sensor)	[Engine is running] • Warm-up condition • Idle speed	Approximately 0V

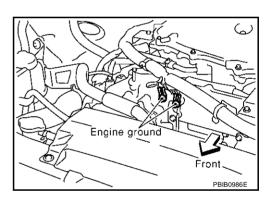
Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

1. Turn ignition switch OFF.

2. Loosen and retighten engine ground screws.

>> GO TO 2.



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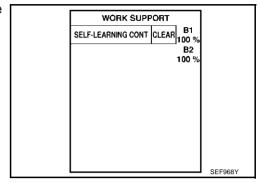
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2. CLEAR THE SELF-LEARNING DATA

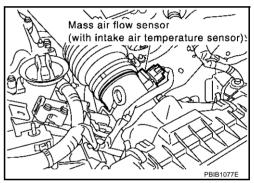
(II) With CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- 2. Select "SELF-LEARNING CONT" in "WORK SUPPORT" mode with CONSULT-II.
- 3. Clear the self-learning control coefficient by touching "CLEAR".
- 4. 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?



(X) Without CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- 2. Turn ignition switch OFF.
- 3. Disconnect mass air flow sensor harness connector, and restart and run engine for at least 5 seconds at idle speed.
- Stop engine and reconnect mass air flow sensor harness connector.
- 5. Make sure DTC P0102 is displayed.
- Erase the DTC memory. Refer to <u>EC-710, "HOW TO ERASE</u> EMISSION-RELATED DIAGNOSTIC INFORMATION".
- 7. Make sure DTC P0000 is displayed.
- 8. 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?

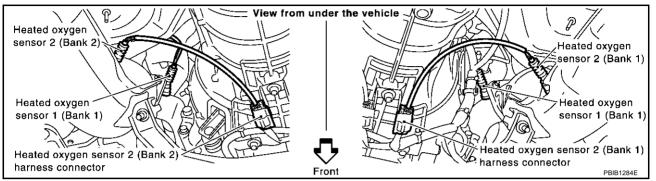


Yes or No

Yes \Rightarrow Perform trouble diagnosis for DTC P0171, P0174 or P0172, P0175. Refer to <u>EC-905</u> or <u>EC-914</u>. No \Rightarrow GO TO 3.

3. CHECK HO2S2 GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Disconnect heated oxygen sensor 2 harness connector.



 Check harness continuity between HO2S2 terminal 4 and ECM terminal 78. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 5. NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-4
- Harness for open or short between HO2S2 and ECM

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

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5. CHECK HO2S2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

 Check harness continuity between ECM terminal and HO2S2 terminal as follows. Refer to Wiring Diagram.

DTC	Terminals		Bank
ыс	ECM	Sensor	Dank
P0139	74	1	1
P0159	55	1	2

Continuity should exist.

2. Check harness continuity between the following terminals and ground. Refer to Wiring Diagram.

DTC	Terminals		Bank
DIC	ECM	Sensor	Dank
P0139	74	1	1
P0159	55	1	2

Continuity should not exist.

3. Also check harness for short to power.

OK or NG

NG

OK >> GO TO 6.

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

6. CHECK HEATED OXYGEN SENSOR 2

Refer to EC-902, "Component Inspection".

OK or NG

OK >> GO TO 7.

NG >> Replace malfunctioning heated oxygen sensor 2.

7. CHECK INTERMITTENT INCIDENT

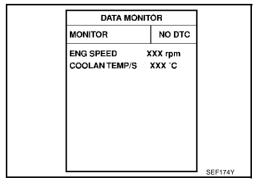
Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

Component Inspection HEATED OXYGEN SENSOR 2

(P) With CONSULT-II

- 1. Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-II.
- 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.
- 5. Let engine idle for 1 minutes.



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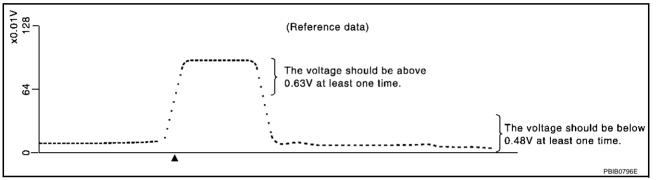
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6. Select "FUEL INJECTION" in "ACTIVE TEST" mode, and select "HO2S2 (B1)/(B2)" as the monitor item with CONSULT-II.

ACTIVE TES	ACTIVE TEST		
FUEL INJECTION	25 %		
MONITOR			
ENG SPEED	XXX rpm		
HO2S1 (B1)	XXX V		
HO2S2 (B1)	XXX V		
HO2S1 MNTR (B1)	RICH		
HO2S2 MNTR (B1)	RICH		
1		SEF662Y	

7. Check "HO2S2 (B1)/(B2)" at idle speed when adjusting "FUEL INJECTION" to $\pm 25\%$.



"HO2S2 (B1)/(B2)" should be above 0.63V at least once when the "FUEL INJECTION" is +25%. "HO2S2 (B1)/(B2)" should be below 0.48V at least once when the "FUEL INJECTION" is -25%.

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 tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.

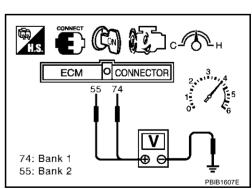
R Without CONSULT-II

- 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 minutes.
- 5. Set voltmeter probes between ECM terminal 74 [HO2S2 (B1) signal] or 55 [HO2S2 (B2) signal] and engine ground.
- Check the voltage when revving up to 4,000 rpm under no load at least 10 times.
 - (Depress and release accelerator pedal as soon as possible.)

 The voltage should be above 0.63V at least once during this
 - If the voltage is above 0.63V at step 6, step 7 is not necessary.
- 7. Keep vehicle at idling for 10 minutes, then check voltage. Or check the voltage when coasting from 80 km/h (50 MPH) in D (A/T), 4th gear position (M/T).
 - The voltage should be below 0.48V at least once during this procedure.
- 8. If NG, replace 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 tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.



DTC P0139, P0159 HO2S2

[TYPE 2]

Removal and Installation HEATED OXYGEN SENSOR 2

ABS0084Y

Refer to EM-24, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

[TYPE 2]

DTC P0171, P0174 FUEL INJECTION SYSTEM FUNCTION

PFP:16600

On Board Diagnosis Logic

ABS00847

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 the heated oxygen sensors 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 lights up the MIL (2 trip detection logic).

Sensor	Input signal to ECM	ECM function	Actuator
Heated oxygen sensors 1	Density of oxygen in exhaust gas (Mixture ratio feedback signal)	Fuel injection control	Fuel injectors

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	Е
P0171 0171 (Bank 1)			Intake air leaks Heated oxygen sensor 1 Injectors	F
P0174 0174 (Bank 2)	Fuel injection system too lean	 Fuel injection system does not operate properly. The amount of mixture ratio compensation is too large. (The mixture ratio is too lean.) 	 Exhaust gas leaks Incorrect fuel pressure Lack of fuel 	G
(Barin 2)			Mass air flow sensorIncorrect PCV hose connection	Н

DTC Confirmation Procedure

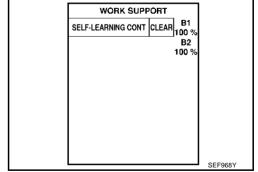
ABS00850

NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

(A) WITH CONSULT-II

- Start engine and warm it up to normal operating temperature.
- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON and select "SELF-LEARNING CONT" in "WORK SUPPORT" mode with CON-3. SULT-II.
- Clear the self-learning control coefficient by touching "CLEAR". 4.
- Select "DATA MONITOR" mode with CONSULT-II.
- Start engine again and let it idle for at least 10 minutes. The 1st trip DTC P0171 or P0174 should be detected at this stage, if a malfunction exists, If so, go to EC-909, "Diagnostic Procedure".
- 7. If it is difficult to start engine at step 6, the fuel injection system has a malfunction, too.
- Crank engine while depressing accelerator pedal. If engine starts, go to EC-909, "Diagnostic Procedure" . If engine does not start, check exhaust and intake air leak visually.



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[TYPE 2]

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. Disconnect mass air flow sensor harness connector. Then restart and run engine for at least 5 seconds at idle speed.
- Stop engine and reconnect mass air flow sensor harness connector.
- 5. Select "MODE 3" with GST. Make sure DTC P0102 is detected.
- Select "MODE 4" with GST and erase the DTC P0102.
- 7. Start engine again and let it idle for at least 10 minutes.
- 8. Select "MODE 7" with GST. The 1st trip DTC P0171 or P0174 should be detected at this stage, if a malfunction exists. If so, go to EC-909, "Diagnostic Procedure".
- 9. If it is difficult to start engine at step 7, the fuel injection system has a malfunction.

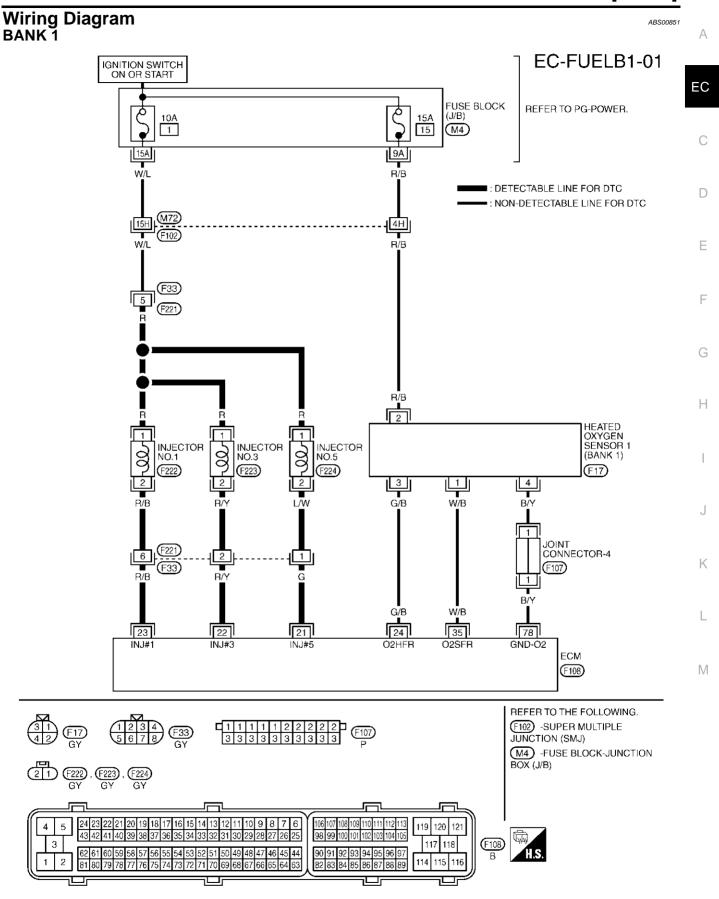


Mass air flow sensor

(with intake air temperature sensor)

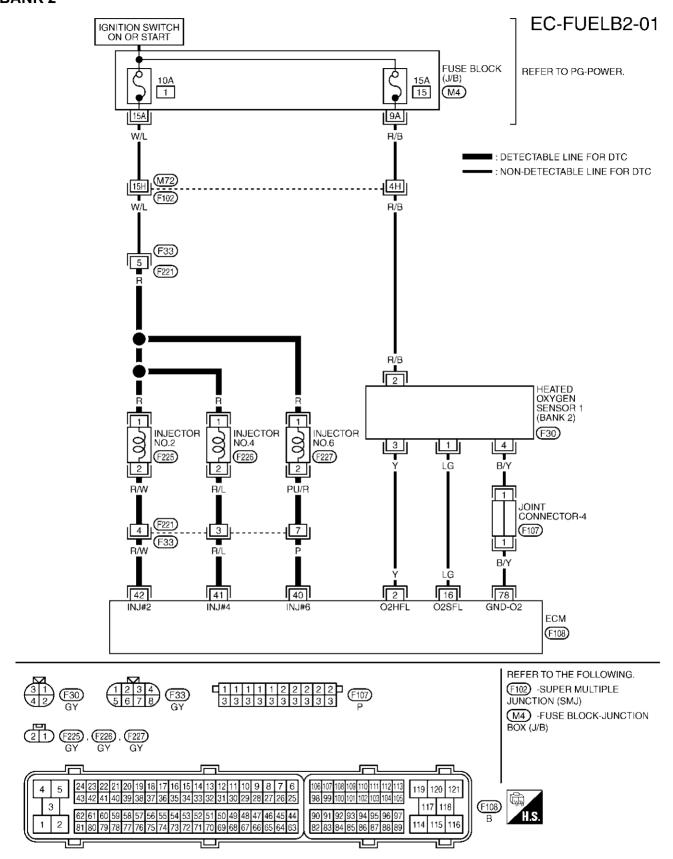
10. Crank engine while depressing accelerator pedal. If engine starts, go to EC-909, "Diagnostic Procedure". If engine does not start, check exhaust and intake air leak visually.

[TYPE 2]



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BANK 2



[TYPE 2]

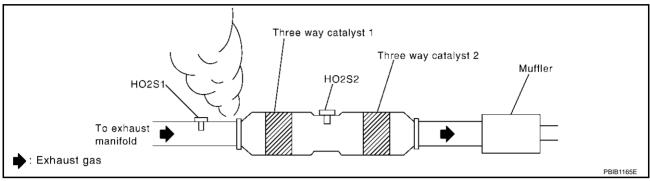
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Diagnostic Procedure

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.



OK or NG

OK >> GO TO 2.

NG >> Repair or replace.

2. CHECK FOR INTAKE AIR LEAK

- 1. Listen for an intake air leak after the mass air flow sensor.
- 2. Check PCV hose connection.

OK or NG

OK >> GO TO 3.

NG >> Repair or replace.

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$\overline{3}$. Check heated oxygen sensor 1 circuit for open and short

- 1. Turn ignition switch OFF.
- 2. Disconnect corresponding heated oxygen sensor 1 (HO2S1) harness connector.
- Disconnect ECM harness connector.
- 4. Check harness continuity between ECM terminal and HO2S1 terminal as follows. Refer to Wiring Diagram.

DTC	Terminals		Bank
DIC	ECM	Sensor	Dalik
P0171	35	1	1
P0174	16	1	2

Continuity should exist.

Check harness continuity between the following terminals and ground. Refer to Wiring Diagram.

DTC	Terminals		Bank
ыс	ECM	Sensor	Dank
P0171	35	1	1
P0174	16	1	2

Continuity should not exist.

Check harness continuity between HO2S1 terminal 4 and ECM terminal 78.

Continuity should exist.

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

OK or NG

OK >> GO TO 5. NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-4
- Harness for open or short between HO2S1 and ECM
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK FUEL PRESSURE

- 1. Release fuel pressure to zero. Refer to EC-694, "FUEL PRESSURE RELEASE" .
- Install fuel pressure gauge and check fuel pressure. Refer to <u>EC-695, "FUEL PRESSURE CHECK"</u>.

At idling: 350 kPa (3.57 kg/cm², 51 psi)

OK or NG

OK >> GO TO 7. NG >> GO TO 6.

[TYPE 2]

6. DETECT MALFUNCTIONING PART

Check the following.

- Fuel pump and circuit (Refer to EC-1259.)
- Fuel pressure regulator (Refer to EC-695.)
- Fuel lines
- Fuel filter for clogging
 - >> Repair or replace.

7. CHECK MASS AIR FLOW SENSOR

(P) With CONSULT-II

- 1. Install all removed parts.
- 2. Check "MASS AIR FLOW" in "DATA MONITOR" mode with CONSULT-II.

2.0 - 6.0 g·m/sec: at idling

7.0 - 20.0 g·m/sec: at 2,500 rpm

With GST

- 1. Install all removed parts.
- 2. Check mass air flow sensor signal in MODE 1 with GST.

2.0 - 6.0 g·m/sec: at idling 7.0 - 20.0 g·m/sec: at 2,500 rpm

OK or NG

>> GO TO 8. OK

NG >> Check connectors for rusted terminals or loose connections in the mass air flow sensor circuit or engine grounds. Refer to EC-810, "DTC P0101 MAF SENSOR" .

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8. CHECK FUNCTION OF INJECTORS

(P) With CONSULT-II

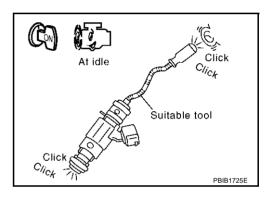
- 1. Start engine.
- 2. Perform "POWER BALANCE" in "ACTIVE TEST" mode with CONSULT-II.
- 3. Make sure that each circuit produces a momentary engine speed drop.

ACTIVE TES	ST .	
POWER BALANCE		
MONITOR		
ENG SPEED	XXX rpm	
MAS A/F SE-B1	xxx v	
		PBIB0133E

(R) Without CONSULT-II

- 1. Start engine.
- 2. Listen to each injector operating sound.

Clicking noise should be heard.



OK or NG

OK >> GO TO 9.

NG >> Perform trouble diagnosis for <u>EC-1253</u>, "INJECTOR CIRCUIT" .

9. CHECK INJECTOR

- 1. Confirm that the engine is cooled down and there are no fire hazards near the vehicle.
- 2. Turn ignition switch OFF.
- 3. Disconnect all injector harness connectors.
- Remove injector gallery assembly. Refer to <u>EM-37</u>, "<u>FUEL INJECTOR AND FUEL TUBE</u>". Keep fuel hose and all injectors connected to injector gallery.
- 5. For DTC P0171, reconnect injector harness connectors on bank 1. For DTC P0174, reconnect injector harness connectors on bank 2.
- 6. Disconnect all ignition coil harness connectors.
- 7. Prepare pans or saucers under each injector.
- 8. Crank engine for about 3 seconds.

For DTC P0171, make sure that fuel splays out from injectors on bank 1.

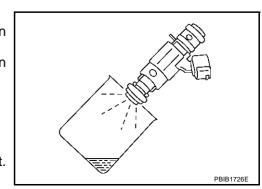
For DTC P0174, make sure that fuel splays out from injectors on bank 2.

Fuel should be sprayed evenly for each injector.

OK or NG

OK >> GO TO 10.

NG >> Replace injectors from which fuel does not spray out.
Always replace O-ring with new ones.



[TYPE 2]

10. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

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[TYPE 2]

DTC P0172, P0175 FUEL INJECTION SYSTEM FUNCTION

PFP:16600

On Board Diagnosis Logic

ABS00853

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 the heated oxygen sensors 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 lights up the MIL (2 trip detection logic).

Sensor	Input signal to ECM	ECM function	Actuator
Heated oxygen sensors 1	Density of oxygen in exhaust gas (Mixture ratio feedback signal)	Fuel injection control	Fuel injectors

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0172 0172 (Bank 1)	Fuel injection system	Fuel injection system does not operate properly. The appropriate for interpretable property. The appropriate for interpretable property.	Heated oxygen sensor 1InjectorsExhaust gas leaks
P0175 0175 (Bank 2)	too rich	The amount of mixture ratio compensation is too large. (The mixture ratio is too rich.)	Incorrect fuel pressureMass air flow sensor

DTC Confirmation Procedure

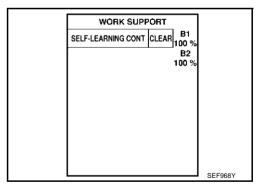
ABS00854

NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

(P) WITH CONSULT-II

- 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 and select "SELF-LEARNING CONT" in "WORK SUPPORT" mode with CON-SULT-II.
- 4. Clear the self-learning control coefficient by touching "CLEAR".
- Select "DATA MONITOR" mode with CONSULT-II.
- Start engine again and let it idle for at least 10 minutes.
 The 1st trip DTC P0172, P0175 should be detected at this stage, if a malfunction exists. If so, go to <u>EC-918</u>, "<u>Diagnostic Procedure</u>".
- 7. If it is difficult to start engine at step 6, the fuel injection system has a malfunction, too.
- Crank engine while depressing accelerator pedal.
 If engine starts, go to <u>EC-918</u>, "<u>Diagnostic Procedure</u>". If engine does not start, remove ignition plugs and check for fouling, etc.

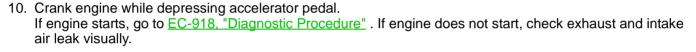


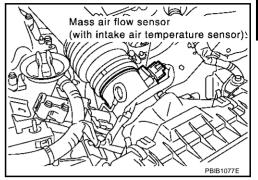
2003 G35 Sedan

[TYPE 2]

® 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. Disconnect mass air flow sensor harness connector. Then restart and run engine for at least 5 seconds at idle speed.
- Stop engine and reconnect mass air flow sensor harness connector.
- 5. Select "MODE 3" with GST. Make sure DTC P0102 is detected.
- Select "MODE 4" with GST and erase the DTC P0102.
- 7. Start engine again and let it idle for at least 10 minutes.
- 8. Select "MODE 7" with GST. The 1st trip DTC P0172 or P0175 should be detected at this stage, if a malfunction exists. If so, go to EC-918, "Diagnostic Procedure".
- 9. If it is difficult to start engine at step 7, the fuel injection system has a malfunction.





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Wiring Diagram BANK 1 ABS00855 EC-FUELB1-01 IGNITION SWITCH ON OR START FUSE BLOCK (J/B) REFER TO PG-POWER. 15A 1 15 (M4) 9A R/B : DETECTABLE LINE FOR DTC : NON-DETECTABLE LINE FOR DTC 4H R/B R/B 2 HEATED OXYGEN SENSOR 1 INJECTOR NO.1 INJECTOR NO.3 700y~ INJECTOR NO.5 700√ ~ (BANK 1) (F223) (F17) (F222) (F224) 3 4 B/Y W/B L₩ G/B JOINT CONNECTOR-4 (F221) 2 6 1 (F<u>107</u>) (F33) R/B G W/B G/B 35 21 24 78 23 22 GND-O2 INJ#1 INJ#3 O2SFR **ECM** (F108) REFER TO THE FOLLOWING. (F102) -SUPER MULTIPLE JUNCTION (SMJ) M4 -FUSE BLOCK-JUNCTION (2 1 F222), F223, F224 GY GY GY BOX (J/B) 5 119 120 121 3 117 118 (F108) 1 2 114 115 116

TBWT0269E

BANK 2 Α EC-FUELB2-01 IGNITION SWITCH ON OR START EC FUSE BLOCK REFER TO PG-POWER. 15A 15 10A 1 (J/B) (M4)9A 15A C W/L R/B ■: DETECTABLE LINE FOR DTC : NON-DETECTABLE LINE FOR DTC D (M72) **|**4H R/B Е (F33) (F221) G R/B Н HEATED OXYGEN SENSOR 1 (BANK 2) INJECTOR NO.2 INJECTOR NO.6 (F30) INJECTOR 700 2007 NO.4 4 B/Y 3 (F226) (F225) (F227) 2 2 $\perp G$ PU/R R/L JOINT CONNECTOR-4 (F221) 3 7 (F107) R/W (F33) Κ R/L LG 16 2 78 42 41 40 INJ#2 IN.1#4 INJ#6 O2HFL O2SFL GND-O2 **ECM** (F108) M REFER TO THE FOLLOWING. (F102) -SUPER MULTIPLE JUNCTION (SMJ) (M4) -FUSE BLOCK-JUNCTION BOX (J/B) F225 , F226 , F227 GY GY GY 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 108 109 110 111 112 113 119 120 5 117 118 (F108)

TBWT0270E

82 83 84 85 86 87 88 89

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[TYPE 2]

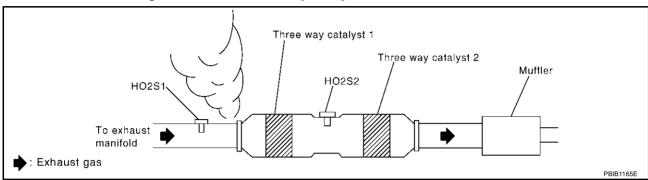
ABS00856

Diagnostic Procedure

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.



OK or NG

OK >> GO TO 2.

NG >> Repair or replace.

2. CHECK FOR INTAKE AIR LEAK

Listen for an intake air leak after the mass air flow sensor.

OK or NG

OK >> GO TO 3.

NG >> Repair or replace.

[TYPE 2]

3. CHECK HEATED OXYGEN SENSOR 1 CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect corresponding heated oxygen sensor 1 (HO2S1) harness connector.
- Disconnect ECM harness connector.
- 4. Check harness continuity between ECM terminal and HO2S1 terminal as follows. Refer to Wiring Diagram.

DTC	Tern	Bank	
ыс	ECM	Sensor	Dalik
P0172	35	1	1
P0175	16	1	2

Continuity should exist.

5. Check harness continuity between the following terminals and ground. Refer to Wiring Diagram.

DTC	Terminals		Bank
ыс	ECM	Sensor	Dank
P0172	35	1	1
P0175	16	1	2

Continuity should not exist.

6. Check harness continuity between HO2S1 terminal 4 and ECM terminal 78.

Continuity should exist.

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

OK or NG

OK >> GO TO 5. NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-4
- Harness for open or short between HO2S1 and ECM

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

5. CHECK FUEL PRESSURE

- 1. Release fuel pressure to zero. Refer to EC-694, "FUEL PRESSURE RELEASE" .
- Install fuel pressure gauge and check fuel pressure. Refer to <u>EC-695, "FUEL PRESSURE CHECK"</u>.

At idling: 350 kPa (3.57 kg/cm², 51 psi)

OK or NG

OK >> GO TO 7. NG >> GO TO 6. EC

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[TYPE 2]

6. DETECT MALFUNCTIONING PART

Check the following.

- Fuel pump and circuit (Refer to, EC-1259.)
- Fuel pressure regulator (Refer to EC-695.)
 - >> Repair or replace.

7. CHECK MASS AIR FLOW SENSOR

(II) With CONSULT-II

- 1. Install all removed parts.
- 2. Check "MASS AIR FLOW" in "DATA MONITOR" mode with CONSULT-II.

2.0 - 6.0 g·m/sec: at idling 7.0 - 20.0 g·m/sec: at 2,500 rpm

With GST

- 1. Install all removed parts.
- 2. Check mass air flow sensor signal in MODE 1 with GST.

2.0 - 6.0 g·m/sec: at idling 7.0 - 20.0 g·m/sec: at 2,500 rpm

OK or NG

OK >> GO TO 8.

NG >> Check connectors for rusted terminals or loose connections in the mass air flow sensor circuit or engine grounds. Refer to EC-810, "DTC P0101 MAF SENSOR".

[TYPE 2]

8. CHECK FUNCTION OF INJECTORS

(II) With CONSULT-II

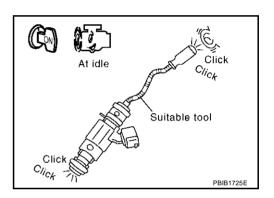
- Start engine.
- Perform "POWER BALANCE" in "ACTIVE TEST" mode with CONSULT-II.
- 3. Make sure that each circuit produces a momentary engine speed drop.

		i
ACTIVE TE	ACTIVE TEST	
POWER BALANCE		
MONITOR	1	
ENG SPEED	XXX rpm	
MAS A/F SE-B1	xxx v	
		PBIB0133E

(R) Without CONSULT-II

- 1. Start engine.
- Listen to each injector operating sound.

Clicking noise should be heard.



OK or NG

OK >> GO TO 9.

NG >> Perform trouble diagnosis for EC-1253, "INJECTOR CIRCUIT".

9. CHECK INJECTOR

- Remove injector assembly. Refer to EM-37, "FUEL INJECTOR AND FUEL TUBE". Keep fuel hose and all injectors connected to injector gallery.
- Confirm that the engine is cooled down and there are no fire hazards near the vehicle.
- Disconnect all injector harness connectors.
- Disconnect all ignition coil harness connectors.
- Prepare pans or saucers under each injectors.
- Crank engine for about 3 seconds. Make sure fuel does not drip from injector.

OK or NG

OK (Does not drip.)>>GO TO 10.

NG (Drips.)>>Replace the injectors from which fuel is dripping. Always replace O-ring with new one.

10. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

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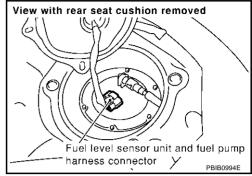
DTC P0181 FTT SENSOR

PFP:22630

Component Description

ABS00857

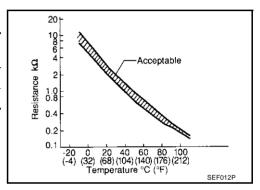
The fuel tank temperature sensor is used to detect the fuel temperature inside the fuel tank. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the fuel temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical 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 terminal 107 (Fuel tank temperature sensor) and ground.



CAUTION:

Do not 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.

On Board Diagnosis Logic

ABS00858

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0181 0181	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

DTC Confirmation Procedure

ABS00859

NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

(WITH CONSULT-II

- 1. Turn ignition switch ON.
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- Wait at least 10 seconds.
 If the result is NG, go to <u>EC-925</u>, "<u>Diagnostic Procedure</u>".
 If the result is OK, go to following step.
- 4. Check "COOLAN TEMP/S" value.

 If "COOLAN TEMP/S" is less than 60°C (140°F), the result will be OK.

 If "COOLAN TEMP/S" is above 60°C (140°F), go to the following step.
- Cool engine down until "COOLAN TEMP/S" is less than 60°C (140°F).
- Wait at least 10 seconds.
- 7. If 1st trip DTC is detected, go to EC-925, "Diagnostic Procedure".

DTC P0181 FTT SENSOR

[TYPE 2]

WITH GST

Follow the procedure "WITH CONSULT-II" above.

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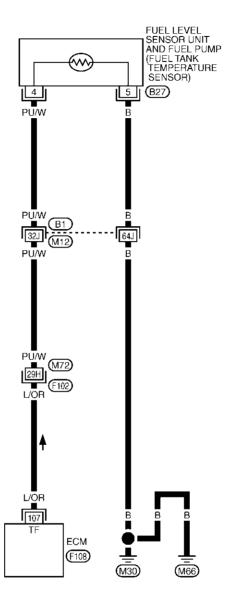
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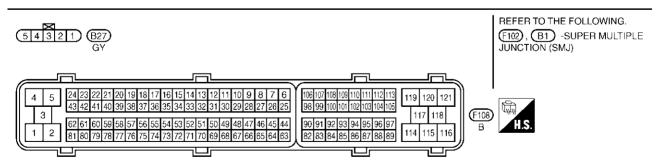
Wiring Diagram

ABS0085A

EC-FTTS-01







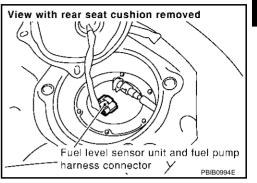
TBWT0455E

ITYPE 21

Diagnostic Procedure

1. CHECK FUEL TANK TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

- Turn ignition switch OFF.
- Disconnect "fuel level sensor unit and fuel pump" harness con-2. nector.
- Turn ignition switch ON. 3.

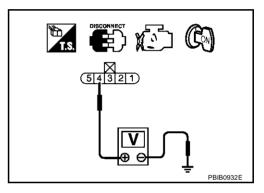


Check voltage between "fuel level sensor unit and fuel pump" terminal 4 and ground with CONSULT-II or tester.

Voltage: Approximately 5V

OK or NG

OK >> GO TO 3. NG >> GO TO 2.



2. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M72, F102
- Harness connectors B1, M12
- Harness for open or short between ECM and "fuel level sensor unit and fuel pump"

>> Repair harness or connector.

3. CHECK FUEL TANK TEMPERATURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- Check harness continuity between "fuel level sensor unit and fuel pump" terminal 5 and body ground. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 5. NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B1, M12
- Harness for open or short between "fuel level sensor unit and fuel pump" and body ground.
 - >> Repair open circuit or short to power in harness or connector.

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5. CHECK FUEL TANK TEMPERATURE SENSOR

Refer to EC-926, "Component Inspection".

OK or NG

OK >> GO TO 6.

NG >> Replace fuel level sensor unit.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

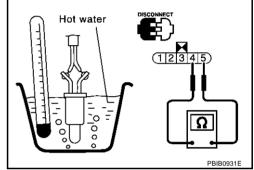
>> INSPECTION END

Component Inspection FUEL TANK TEMPERATURE SENSOR

ABS0085C

- 1. Remove fuel level sensor unit.
- 2. Check resistance between "fuel level sensor unit and fuel pump" terminals 4 and 5 by heating with hot water or heat gun as shown in the figure.

Temperature °C (°F)	Resistance $k\Omega$
20 (68)	2.3 - 2.7
50 (122)	0.79 - 0.90



Removal and Installation FUEL TANK TEMPERATURE SENSOR

Refer to FL-5, "FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY".

[TYPE 2]

DTC P0182, P0183 FTT SENSOR

PFP:22630

Component Description

ABS0085E

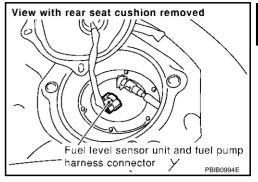
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The fuel tank temperature sensor is used to detect the fuel temperature inside the fuel tank. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the fuel temperature input. The sensor uses a thermistor which 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 terminal 107 (Fuel tank temperature sensor) and ground.

CAUTION:

Do not 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.

On Board Diagnosis Logic

ABS0085F

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0182 0182	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 0183	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

ABS0085G

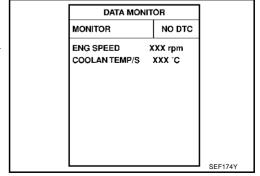
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NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

(A) WITH CONSULT-II

- Turn ignition switch ON.
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- Wait at least 5 seconds.
- If 1st trip DTC is detected, go to <u>EC-929</u>, "<u>Diagnostic Procedure</u>"



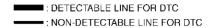
WITH GST

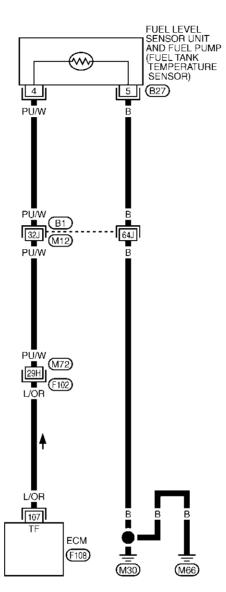
Follow the procedure "WITH CONSULT-II" above.

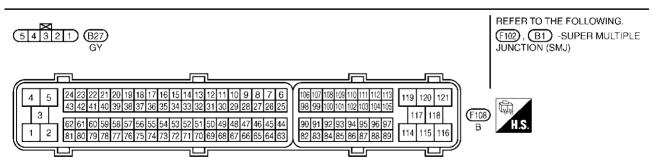
Wiring Diagram

ABS0085H

EC-FTTS-01







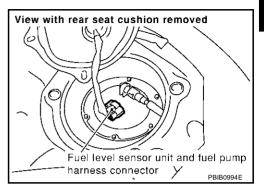
TBWT0455E

ITYPE 21

Diagnostic Procedure

1. CHECK FUEL TANK TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

- Turn ignition switch OFF.
- Disconnect "fuel level sensor unit and fuel pump" harness con-2. nector.
- Turn ignition switch ON. 3.

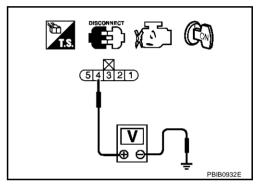


Check voltage between "fuel level sensor unit and fuel pump" terminal 4 and ground with CONSULT-II or tester.

Voltage: Approximately 5V

OK or NG

OK >> GO TO 3. NG >> GO TO 2.



2. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M72, F102
- Harness connectors B1, M12
- Harness for open or short between ECM and "fuel level sensor unit and fuel pump"

>> Repair harness or connector.

3. CHECK FUEL TANK TEMPERATURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- Check harness continuity between "fuel level sensor unit and fuel pump" terminal 5 and body ground. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 5. NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

Revision; 2004 April

- Harness connectors B1, M12
- Harness for open or short between "fuel level sensor unit and fuel pump" and body ground.
 - >> Repair open circuit or short to power in harness or connector.

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5. CHECK FUEL TANK TEMPERATURE SENSOR

Refer to EC-926, "Component Inspection".

OK or NG

OK >> GO TO 6.

NG >> Replace fuel level sensor unit.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

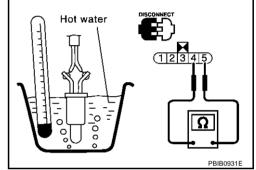
>> INSPECTION END

Component Inspection FUEL TANK TEMPERATURE SENSOR

ABS0085J

- 1. Remove fuel level sensor unit.
- 2. Check resistance between "fuel level sensor unit and fuel pump" terminals 4 and 5 by heating with hot water or heat gun as shown in the figure.

Temperature °C (°F)	Resistance $k\Omega$
20 (68)	2.3 - 2.7
50 (122)	0.79 - 0.90



Removal and Installation FUEL TANK TEMPERATURE SENSOR

ABS0085K

Refer to FL-5, "FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY".

DTC P0222, P0223 TP SENSOR

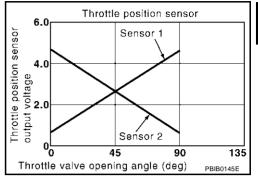
PFP:16119

Component Description

ABS0085I

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 the 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.



CONSULT-II Reference Value in Data Monitor Mode

ABS0085M

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
THRTL SEN1 THRTL SEN2*	• Ignition switch: ON	Accelerator pedal: Fully released	More than 0.36V
	(Engine stopped) ■ Shift lever: D (A/T), 1st (M/T)	Accelerator pedal: Fully depressed	Less than 4.75V

^{*:} Throttle position sensor 2 signal is converted by ECM internally. Thus, it differs from ECM terminal voltage signal.

On Board Diagnosis Logic

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These self-diagnoses have the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	
P0222 0222	Throttle position sensor 1 circuit low input	An excessively low voltage from the TP sensor 1 is sent to ECM.	Harness or connectors (The TP sensor 1 circuit is open or	
			shorted.) (APP sensor 2 circuit is shorted.)	
· ·	An excessively high voltage from the TP sensor 1 is sent to ECM.	Electric throttle control actuator (TP sensor 1)		
			 Accelerator pedal position sensor (APP sensor 2) 	

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode an the MIL lights up.

Engine operation condition in fail-safe mode

ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees.

ECM regulates the opening speed of the throttle valve to be slower than the normal condition.

So, the acceleration will be poor.

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DTC Confirmation Procedure

ABS00D9T

NOTE:

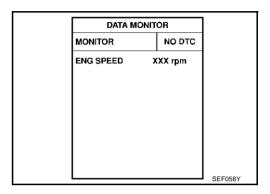
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

(P) WITH CONSULT-II

- 1. Turn ignition switch ON.
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- 3. Start engine and let it idle for 1 second.
- 4. If DTC is detected, go to EC-934, "Diagnostic Procedure" .



WITH GST

Follow the procedure "WITH CONSULT-II" above.

Wiring Diagram

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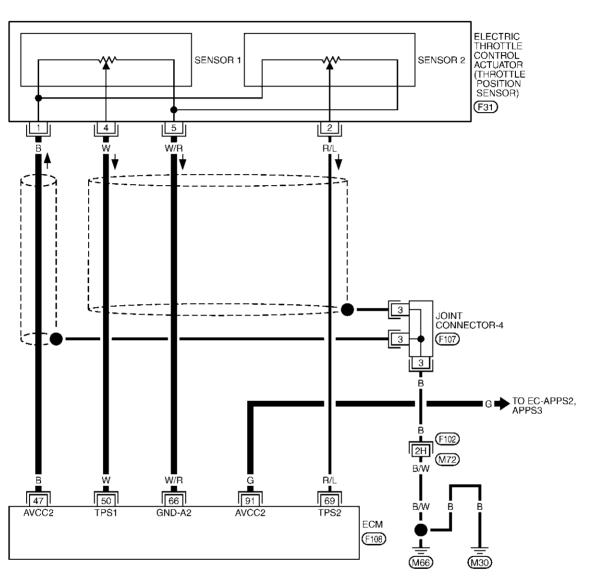
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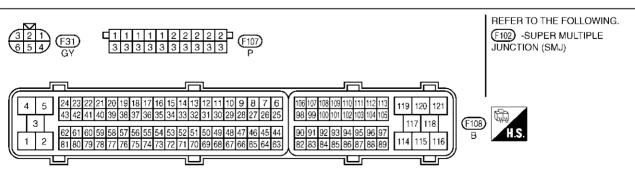
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EC-TPS1-01







TBWB0067E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
47	В	Sensors' power supply (Throttle position sensor)	[Ignition switch: ON]	Approximately 5V
50 W			 [Ignition switch: ON] Engine stopped Shift lever: D (A/T) or 1st (M/T) Accelerator pedal fully released 	More than 0.36V
30	50 W Throttle position sensor 1	 [Ignition switch: ON] Engine stopped Shift lever: D (A/T) or 1st (M/T) Accelerator pedal fully depressed 	Less than 4.75V	
66	W/R	Sensors' ground (Throttle position sensor)	[Engine is running]Warm-up conditionIdle speed	Approximately 0V
69	R/L	Throttle position sensor 2	 [Ignition switch: ON] Engine stopped Shift lever: D (A/T) or 1st (M/T) Accelerator pedal fully released 	Less than 4.75V
09	IVL	THIOLIE POSITION SENSOI 2	 [Ignition switch: ON] Engine stopped Shift lever: D (A/T) or 1st (M/T) Accelerator pedal fully depressed 	More than 0.36V
91	G	Sensors' power supply (APP sensor 2)	[Ignition switch: ON]	Approximately 5V

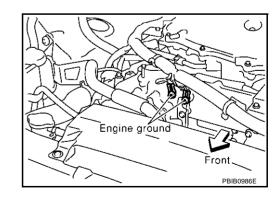
Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

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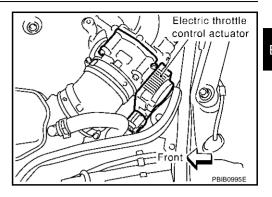
- Turn ignition switch OFF.
- 2. Loosen and retighten engine ground screws.

>> GO TO 2.



$\overline{2}$. CHECK THROTTLE POSITION SENSOR 1 POWER SUPPLY CIRCUIT-I

- 1. Disconnect electric throttle control actuator harness connector.
- 2. Turn ignition switch ON.

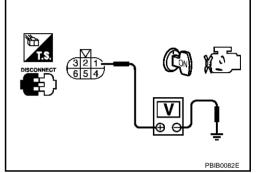


Check voltage between electric throttle control actuator terminal 1 and ground with CONSULT-II or tester.

Voltage: Approximately 5V

OK or NG

OK >> GO TO 7. NG >> GO TO 3.



3. CHECK THROTTLE POSITION SENSOR 1 POWER SUPPLY CIRCUIT-II

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check harness continuity between electric throttle control actuator terminal 1 and ECM terminal 47. Refer to Wiring Diagram.

Continuity should exist.

OK or NG

OK >> GO TO 4.

NG >> Repair or replace open circuit.

4. CHECK THROTTLE POSITION SENSOR 1 POWER SUPPLY CIRCUIT-III

Check harness for short to power and short to ground, between the following terminals.

ECM terminal	Sensor terminal	Reference Wiring Diagram
47	Electric throttle control actuator terminal 1	EC-933
91	APP sensor terminal 4	EC-1220

OK or NG

OK >> GO TO 5.

NG >> Repair short to ground or short to power in harness or connectors.

5. CHECK APP SENSOR

Refer to EC-1224, "Component Inspection".

OK or NG

OK >> GO TO 11. NG >> GO TO 6.

EC-935 Revision; 2004 April 2003 G35 Sedan

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6. REPLACE ACCELERATOR PEDAL ASSEMBLY

- 1. Replace the accelerator pedal assembly.
- 2. Perform EC-692, "Accelerator Pedal Released Position Learning".
- 3. Perform EC-692, "Throttle Valve Closed Position Learning".
- 4. Perform EC-692, "Idle Air Volume Learning".

>> INSPECTION END

7. CHECK THROTTLE POSITION SENSOR 1 GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check harness continuity between electric throttle control actuator terminal 5 and ECM terminal 66. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 8.

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

8. CHECK THROTTLE POSITION SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

 Check harness continuity between ECM terminal 50 and electric throttle control actuator terminal 4. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 9.

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

9. CHECK THROTTLE POSITION SENSOR

Refer to EC-937. "Component Inspection".

OK or NG

OK >> GO TO 11.

NG >> GO TO 10.

10. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

- 1. Replace the electric throttle control actuator.
- 2. Perform EC-692, "Throttle Valve Closed Position Learning".
- 3. Perform EC-692, "Idle Air Volume Learning".

>> INSPECTION END

11. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

Component Inspection THROTTLE POSITION SENSOR

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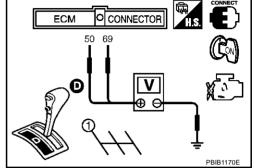
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- Reconnect all harness connectors disconnected.
- 2. Perform EC-692, "Throttle Valve Closed Position Learning".
- Turn ignition switch ON.
- 4. Set selector lever to D (A/T), 1st (M/T) position.
- Check voltage between ECM terminals 50 (TP sensor 1signal),
 (TP sensor 2signal) and engine ground under the following conditions.

Terminal	Accelerator pedal	Voltage
50	Fully released	More than 0.36V
(Throttle position sensor 1)	Fully depressed	Less than 4.75V
69	Fully released	Less than 4.75V
(Throttle position sensor 2)	Fully depressed	More than 0.36V



- 6. If NG, replace electric throttle control actuator and go to the next step.
- 7. Perform EC-692, "Throttle Valve Closed Position Learning".
- 8. Perform EC-692, "Idle Air Volume Learning".

Removal and Installation **ELECTRIC THROTTLE CONTROL ACTUATOR**

Refer to EM-18, "INTAKE MANIFOLD COLLECTOR".

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Revision; 2004 April EC-937 2003 G35 Sedan

DTC P0300 - P0306 MULTIPLE CYLINDER MISFIRE, NO. 1 - 6 CYLINDER MISFIRE

[TYPE 2]

DTC P0300 - P0306 MULTIPLE CYLINDER MISFIRE, NO. 1 - 6 CYLINDER MISFIRE

On Board Diagnosis Logic

ARSOOR5T

When a misfire occurs, engine speed will fluctuate. If the engine speed fluctuates enough to cause the crank-shaft position (CKP) sensor (POS) signal to vary, ECM can determine that a misfire is occurring.

Sensor	Input Signal to ECM	ECM function
Crankshaft position sensor (POS)	Engine speed	On board diagnosis of misfire

The misfire detection logic consists of the following two conditions.

- One Trip Detection Logic (Three Way Catalyst Damage)
 - On the first 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 on any one cylinder or on multiple cylinders.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0300 0300	Multiple cylinder misfire detected	Multiple cylinder misfire.	Improper spark plug
P0301 0301	No.1 cylinder misfire detected	No. 1 cylinder misfires.	Insufficient compressionIncorrect fuel pressure
P0302 0302	No. 2 cylinder misfire detected	No. 2 cylinder misfires.	The injector circuit is open or shortedFuel injectors
P0303 0303	No. 3 cylinder misfire detected	No. 3 cylinder misfires.	Intake air leak The ignition signal circuit is open or
P0304 0304	No. 4 cylinder misfire detected	No. 4 cylinder misfires.	shorted • Lack of fuel
P0305 0305	No. 5 cylinder misfire detected	No. 5 cylinder misfires.	Signal plate Heated oxygen sensor 1
P0306 0306	No. 6 cylinder misfire detected	No. 6 cylinder misfires.	Incorrect PCV hose connection

DTC Confirmation Procedure

ABS0085U

CAUTION:

Always drive vehicle at a safe speed.

NOTE

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

DTC P0300 - P0306 MULTIPLE CYLINDER MISFIRE, NO. 1 - 6 CYLINDER MIS-

[TYPE 2]

(A) WITH CONSULT-II

- Turn ignition switch ON, and select "DATA MONITOR" mode with CONSULT-II.
- Start engine and warm it up to normal operating temperature.
- Turn ignition switch OFF and wait at least 10 seconds.
- Restart engine and let it idle for about 15 minutes.
- If 1st trip DTC is detected, go to EC-939, "Diagnostic Procedure"

NOTE:

If 1st trip DTC is not detected during above procedure, performing the following procedure is advised.

- Turn ignition switch OFF and wait at least 10 seconds.
- Start engine and drive the vehicle under the 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.

The similar conditions to (1st trip) Freeze Frame Data means the vehicle operation that the following conditions should be satisfied at the same time.

Engine speed	Engine speed in the freeze frame data \pm 400 rpm
Vehicle speed	Vehicle speed in the freeze frame data ± 10 km/h (5 MPH)
Engine coolant temperature	When the freeze frame data shows lower than 70 °C (158 °F), T should be lower than 70 °C (158 °F).
(T) 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).

The time to driving 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

WITH GST

Follow the procedure "WITH CONSULT-II" above.

Diagnostic Procedure

1. CHECK FOR INTAKE AIR LEAK AND PCV HOSE

- 1. Start engine and run it at idle speed.
- Listen for the sound of the intake air leak.
- Check PCV hose connection.

OK or NG

OK >> GO TO 2.

NG >> Discover air leak location and repair.

2. CHECK FOR EXHAUST SYSTEM CLOGGING

Stop engine and visually check exhaust tube, three way catalyst and muffler for dents.

OK or NG

OK >> GO TO 3.

NG >> Repair or replace it.

DATA MONITOR MONITOR NO DTC ENG SPEED XXX rpm COOLAN TEMP/S XXX ,C VHCL SPEED SE XXX km/h B/FUEL SCHDL XXX msec PBIB0164E

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DTC P0300 - P0306 MULTIPLE CYLINDER MISFIRE, NO. 1 - 6 CYLINDER MISFIRE

[TYPE 2]

3. PERFORM POWER BALANCE TEST

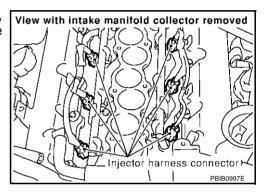
(P) With CONSULT-II

- 1. Perform "POWER BALANCE" in "ACTIVE TEST" mode.
- 2. Is there any cylinder which does not produce a momentary engine speed drop?

ACTIVE TES	ST	
POWER BALANCE		
MONITOR		
ENG SPEED	XXX rpm	
MAS A/F SE-B1	xxx v	
	† ·	
		PBIB0133E

(R) Without CONSULT-II

When disconnecting each injector harness connector one at a time, is there any cylinder which does not produce a momentary engine speed drop?



Yes or No

Yes >> GO TO 4.

No >> GO TO 7.

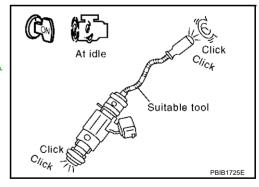
4. CHECK INJECTOR

Does each injector make an operating sound at idle? Yes or No

Yes >> GO TO 5.

No >> Check ini

>> Check injector(s) and circuit(s). Refer to <u>EC-1253</u>, <u>"INJECTOR CIRCUIT"</u>.



DTC P0300 - P0306 MULTIPLE CYLINDER MISFIRE, NO. 1 - 6 CYLINDER MIS-

[TYPE 2]

5. CHECK IGNITION SPARK

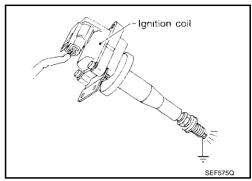
- Remove ignition coil assembly from rocker cover.
- 2. Remove spark plug from ignition coil assembly
- 3. Connect a known good spark plug to the ignition coil.
- 4. Place end of spark plug against a suitable ground and crank engine.
- 5. Check for spark.

OK or NG

OK >> GO TO 6.

NG

>> Check ignition coil, power transistor and their circuits. Refer to EC-1241, "IGNITION SIGNAL".



6. CHECK SPARK PLUGS

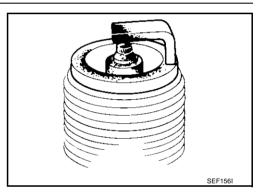
Remove the spark plugs and check for fouling, etc.

OK or NG

OK >> GO TO 7.

NG

>> Repair or replace spark plug(s) with standard type one(s). For spark plug type, refer to, MA-19, "Changing Spark Plugs (Platinum-Tipped Type)".



7. CHECK COMPRESSION PRESSURE

Check compression pressure. Refer to EM-87, "CHECKING COMPRESSION PRESSURE" .

Standard: 1,275 kPa (13.0 kg/cm², 185 psi)/300 rpm Minimum: 981 kPa (10.0 kg/cm², 142 psi)/300 rpm

Difference between each 98 kPa (1.0 kg/cm², 14 psi)/300 rpm

cylinder:

OK or NG

OK >> GO TO 8.

NG >> Check pistons, piston rings, valves, valve seats and cylinder head gaskets.

8. CHECK FUEL PRESSURE

- 1. Install all removed parts.
- Release fuel pressure to zero. Refer to EC-694, "FUEL PRESSURE RELEASE".
- Install fuel pressure gauge and check fuel pressure. Refer to EC-695, "FUEL PRESSURE CHECK" .

At idle: Approx. 350 kPa (3.57 kg/cm², 51 psi)

OK or NG

OK >> GO TO 10. NG >> GO TO 9.

EC-941 2003 G35 Sedan Revision; 2004 April

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DTC P0300 - P0306 MULTIPLE CYLINDER MISFIRE, NO. 1 - 6 CYLINDER MISFIRE

[TYPE 2]

9. DETECT MALFUNCTIONING PART

Check the following.

- Fuel pump and circuit (Refer to <u>EC-1259</u>, "<u>FUEL PUMP CIRCUIT</u>"
- Fuel pressure regulator (Refer to EC-695, "FUEL PRESSURE CHECK" .)
- Fuel lines
- Fuel filter for clogging

>> Repair or replace.

10. CHECK IGNITION TIMING

Check the following items. Refer to EC-727, "Basic Inspection" .

Items	Specifications	
Target idle speed	A/T	650 ± 50 rpm (in P or N position)
Target idle speed	M/T	650 ± 50 rpm (in N position)
Ignition timing	A/T	15 ± 5° BTDC (in P or N position)
ignition timing	M/T	15 ± 5° BTDC (in N position)

OK or NG

OK >> GO TO 11.

NG >> Follow the EC-727, "Basic Inspection".

11. CHECK HEATED OXYGEN SENSOR 1 (BANK 1)/(BANK 2)

Refer to EC-858, "Component Inspection".

OK or NG

OK >> GO TO 13. NG >> GO TO 12.

12. CHECK MASS AIR FLOW SENSOR

(P) With CONSULT-II

Check mass air flow sensor signal in "DATA MONITOR" mode with CONSULT-II.

2.0 - 6.0 g·m/sec: at idling 7.0 - 20.0 g·m/sec: at 2,500 rpm

With GST

Check mass air flow sensor signal in MODE 1 with GST.

2.0 - 6.0 g·m/sec: at idling 7.0 - 20.0 g·m/sec: at 2,500 rpm

OK or NG

NG

OK >> GO TO 13.

>> Check connectors for rusted terminals or loose connections in the mass air flow sensor circuit or engine grounds. Refer to EC-810, "DTC P0101 MAF SENSOR".

13. CHECK SYMPTOM MATRIX CHART

Check items on the rough idle symptom in EC-732, "Symptom Matrix Chart".

OK or NG

OK >> GO TO 14.

NG >> Repair or replace.

DTC P0300 - P0306 MULTIPLE CYLINDER MISFIRE, NO. 1 - 6 CYLINDER MISFIRE

[TYPE 2]

14. 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 <u>EC-710, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION"</u>.

>> GO TO 15.

15. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

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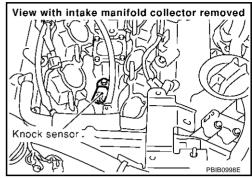
DTC P0327, P0328 KS

PFP:22060

Component Description

ABS0085W

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.



On Board Diagnosis Logic

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The MIL will not light up for these diagnoses.

DTC No.	Trouble diagnosis name	DTC detected condition	Possible cause
P0327 0327	Knock 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.)
P0328 0328	Knock sensor circuit high input	An excessively high voltage from the sensor is sent to ECM.	Knock sensor

DTC Confirmation Procedure

ABS0085Y

NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

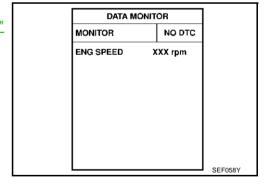
TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

(P) WITH CONSULT-II

- 1. Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-II.
- Start engine and run it for at least 5 seconds at idle speed.
- If 1st trip DTC is detected, go to <u>EC-946</u>, "<u>Diagnostic Procedure</u>"

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WITH GST

Follow the procedure "WITH CONSULT-II" above.

Wiring Diagram

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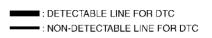
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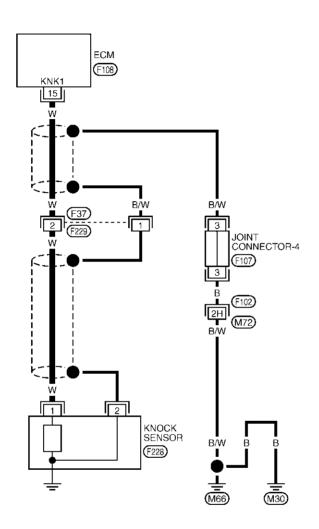
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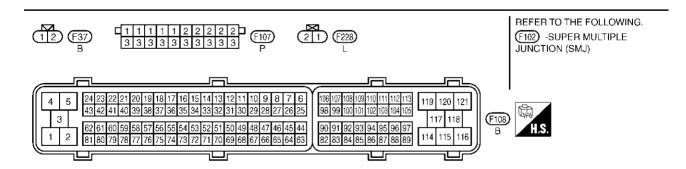
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Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
15	W	Knock sensor	[Engine is running] ● Idle speed	Approximately 2.5V

Diagnostic Procedure

AB\$00860

1. CHECK KNOCK SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT-I

- 1. Turn ignition switch OFF.
- Disconnect ECM harness connector.
- 3. Check resistance between ECM terminal 15 and engine ground. Refer to Wiring Diagram.

NOTE

It is necessary to use an ohmmeter which can measure more than 10 M Ω .

Resistance: Approximately 532 - 588 kΩ [at 20°C (68°F)]

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

OK or NG

OK >> GO TO 4. NG >> GO TO 2.

2. CHECK KNOCK SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT-II

- Disconnect knock sensor harness connector.
- Check harness continuity between ECM terminal 15 and knock sensor terminal 1.

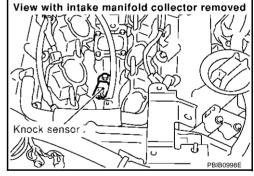
Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 4. NG >> GO TO 3.



3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F37, F229
- Harness for open or short between ECM and knock sensor
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK KNOCK SENSOR

Refer to EC-947, "Component Inspection".

OK or NG

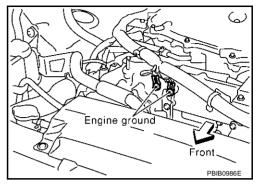
OK >> GO TO 5.

NG >> Replace knock sensor.

5. RETIGHTEN GROUND SCREWS

Loosen and retighten engine ground screws.

>> GO TO 6.



6. CHECK KNOCK SENSOR SHIELD CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect knock sensor harness connector.
- 3. Check harness continuity between knock sensor terminal 2 and engine ground. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to power.

OK or NG

OK >> GO TO 8. NG >> GO TO 7.

7. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-4
- Harness connectors F37, F229
- Harness connectors F102, M72
- Harness for open or short between knock sensor terminal 2 and engine ground
 - >> Repair open circuit or short power in harness or connectors.

8. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

Component Inspection KNOCK SENSOR

Check resistance between knock sensor terminal 1 and ground.

NOTE:

It is necessary to use an ohmmeter which can measure more than 10 $\text{M}\Omega.$

Resistance: Approximately 532 - 588 k Ω [at 20°C (68°F)]

CAUTION:

Do not use any knock sensors that have been dropped or physically damaged. Use only new ones.

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Removal and Installation KNOCK SENSOR

ABS00862

Refer to EM-103, "CYLINDER BLOCK" .

[TYPE 2]

DTC P0335 CKP SENSOR (POS)

PFP:23731

Component Description

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The crankshaft position sensor (POS) is located on the oil pan facing the gear teeth (cogs) of the signal plate. It detects the fluctuation of the engine revolution.

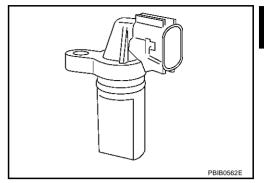
The sensor consists of a permanent magnet and Hall IC.

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.



CONSULT-II Reference Value in Data Monitor Mode

ABS00864

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
ENG SPEED	 Tachometer: Connect Run engine and compare tachometer indication with the CONSULT-II value. 	Almost the same speed as the CONSULT-II value.

On Board Diagnosis Logic

ABS00865

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0335 0335	Crankshaft position sensor (POS) circuit	 The crankshaft position sensor (POS) signal is not detected by the ECM during the first few seconds of engine cranking. The proper pulse signal from the crankshaft position sensor (POS) is not sent to ECM while the engine is running. The crankshaft position sensor (POS) signal is not in the normal pattern during engine running. 	 Harness or connectors (The sensor circuit is open or shorted) Crankshaft position sensor (POS) Signal plate

DTC Confirmation Procedure

ABS00866

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NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10.5V with ignition switch ON.

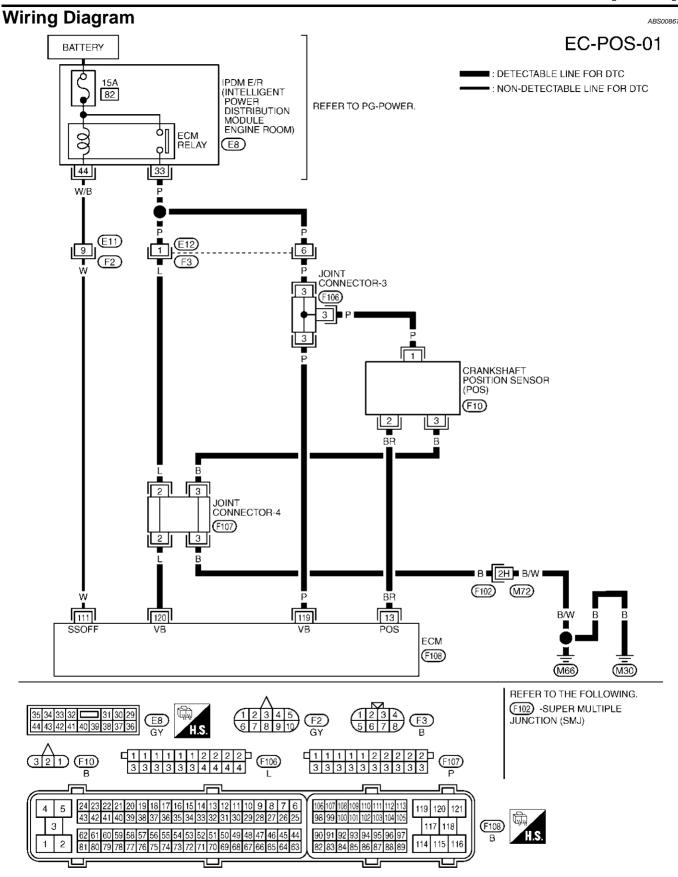
(P) WITH CONSULT-II

- 1. Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-II.
- 2. Crank engine for at least 2 seconds and run it for at least 5 seconds at idle speed.
- 3. If 1st trip DTC is detected, go to EC-951, "Diagnostic Procedure"

DATA M	IONITOR	
MONITOR	NO DTC	
ENG SPEED	XXX rpm	1
		SEF058

® WITH GST

Follow the procedure "WITH CONSULT-II" above.



TBWT0419E

DTC P0335 CKP SENSOR (POS)

[TYPE 2]

Specification data are reference values and are measured between each terminal and ground. Pulse signal is measured by CONSULT-II.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
	9	Crankshaft position sensor	[Engine is running] • Warm-up condition • Idle speed	Approximately 1.2V★ 200 5.0 V/Div 1 ma/Div T PBIB1041E
13	BR	(POS)	[Engine is running] ● Engine speed is 2,000 rpm.	Approximately 1.1V★

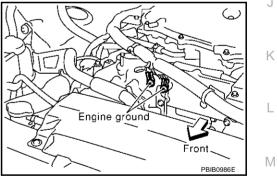
^{★:} Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

- Turn ignition switch OFF.
- Loosen and retighten engine ground screws.

>> GO TO 2.



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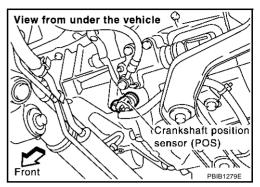
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ABS00868

2. CHECK CRANKSHAFT POSITION (CKP) SENSOR (POS) POWER SUPPLY CIRCUIT

- Disconnect crankshaft position (CKP) sensor (POS) harness connector.
- 2. Turn ignition switch ON.

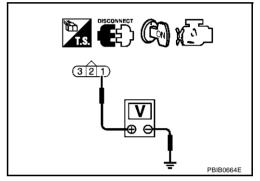


3. Check voltage between CKP sensor (POS) terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 4. NG >> GO TO 3.



3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Joint connector-3
- Joint connector-4
- Harness for open or short between crankshaft position sensor (POS) and ECM
- Harness for open or short between crankshaft position sensor (POS) and IPDM E/R
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK CKP SENSOR (POS) GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- Check harness continuity between CKP sensor (POS) terminal 3 and engine ground. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 6. NG >> GO TO 5.

DTC P0335 CKP SENSOR (POS)

[TYPE 2]

5. DETECT MALFUNCTIONING PART	A
Check the following.	
Harness connectors F102, M72	EC
 Joint connector-4 Harness for open or short between crankshaft position sensor (POS) and ground 	
Harriess for open or short between crankshart position sensor (POS) and ground	
>> Repair open circuit or short to power in harness or connectors.	С
6. CHECK CKP SENSOR (POS) INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT	D
Disconnect ECM harness connector.	D
2. Check harness continuity between ECM terminal 13 and CKP sensor (POS) terminal 2.	
Refer to Wiring Diagram.	Е
Continuity should exist.	
3. Also check harness for short to ground and short to power.	F
OK or NG OK >> GO TO 7.	
NG >> Repair open circuit or short to ground or short to power in harness or connectors.	G
7. CHECK CRANKSHAFT POSITION SENSOR (POS)	
Refer to EC-954, "Component Inspection".	Н
OK or NG	
OK >> GO TO 8. NG >> Replace crankshaft position sensor (POS).	I
8. CHECK GEAR TOOTH	
Visually check for chipping signal plate gear tooth.	J
OK or NG	
OK >> GO TO 9. NG >> Replace the signal plate.	K
9. CHECK INTERMITTENT INCIDENT	
	L
Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".	

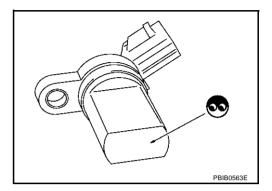
>> INSPECTION END

[TYPE 2]

Component Inspection CRANKSHAFT POSITION SENSOR (POS)

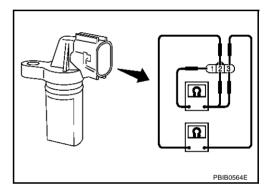
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- 1. Loosen the fixing bolt of the sensor.
- 2. Disconnect crankshaft position sensor (POS) harness connector.
- 3. Remove the sensor.
- 4. Visually check the sensor for chipping.



5. Check resistance as shown in the figure.

Terminal No. (Polarity)	Resistance Ω [at 25°C (77°F)]
1 (+) - 2 (-)	
1 (+) - 3 (-)	Except 0 or ∞
2 (+) - 3 (-)	



ABS0086A

Removal and Installation CRANKSHAFT POSITION SENSOR (POS)

Refer to EM-28, "OIL PAN AND OIL STRAINER".

[TYPE 2]

DTC P0340, P0345 CMP SENSOR (PHASE)

Component Description

PFP:23731

ABS0086B

The camshaft position sensor (PHASE) senses the retraction of intake valve camshaft to identify a particular cylinder. The camshaft position sensor (PHASE) senses the piston position.

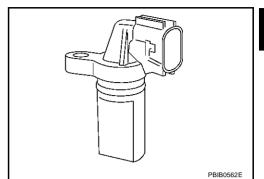
When the crankshaft position sensor (POS) system becomes inoperative, the camshaft position sensor (PHASE) provides various controls of engine parts instead, utilizing timing of cylinder identification signals.

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.



CONSULT-II Reference Value in Data Monitor Mode

Specification data are reference values.

MONITOR ITEM CONDITION		SPECIFICATION
ENG SPEED	 Tachometer: Connect Run engine and compare tachometer indication with the CONSULT-II value. 	Almost the same speed as the CONSULT-II value.

On Board Diagnosis Logic

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0340 0340 (Bank 1)	Camshaft position sensor (PHASE) circuit	The cylinder No. signal is not sent to ECM for the first few seconds during engine	Harness or connectors (The sensor circuit is open or shorted)
(Dank 1)		cranking.	Camshaft position sensor (PHASE)
P0345 0345 (Bank 2)		 The cylinder No. signal is not sent to ECM during engine running. The cylinder No. signal is not in the normal 	Camshaft (Intake)
			• Starter motor (Refer to SC-9.)
			• Starting system circuit (Refer to <u>SC-9</u> .)
		pattern during engine running.	Dead (Weak) battery

DTC Confirmation Procedure

ABS0086D

NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

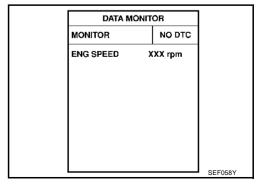
Before performing the following procedure, confirm that battery voltage is more than 10.5V with ignition switch ON.

(P) WITH CONSULT-II

- 1. Turn ignition switch ON.
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- Crank engine for at least 2 seconds and run it for at least 5 seconds at idle speed.
- 4. If 1st trip DTC is detected, go to EC-960, "Diagnostic Procedure"

If 1st trip DTC is not detected, go to next step.

- Maintaining engine speed at more than 800 rpm for at least 5 seconds.
- 6. If 1st trip DTC is detected, go to EC-960, "Diagnostic Procedure"



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Revision; 2004 April EC-955 2003 G35 Sedan

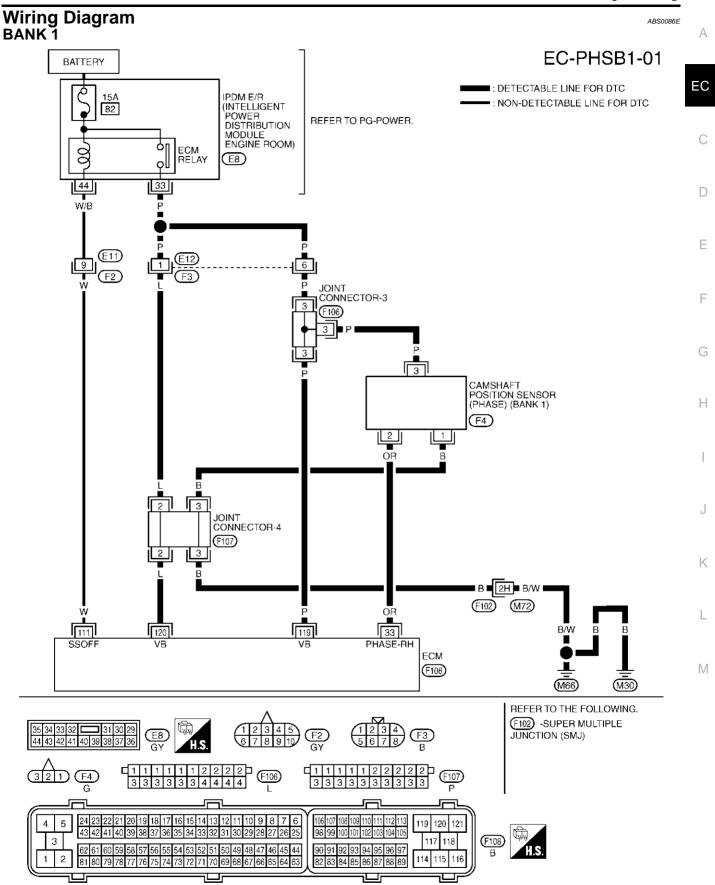
DTC P0340, P0345 CMP SENSOR (PHASE)

[TYPE 2]

WITH GST

Follow the procedure "WITH CONSULT-II" above.

[TYPE 2]



TBWT0420E

DTC P0340, P0345 CMP SENSOR (PHASE)

[TYPE 2]

Specification data are reference values and are measured between each terminal and ground. Pulse signal is measured by CONSULT-II.

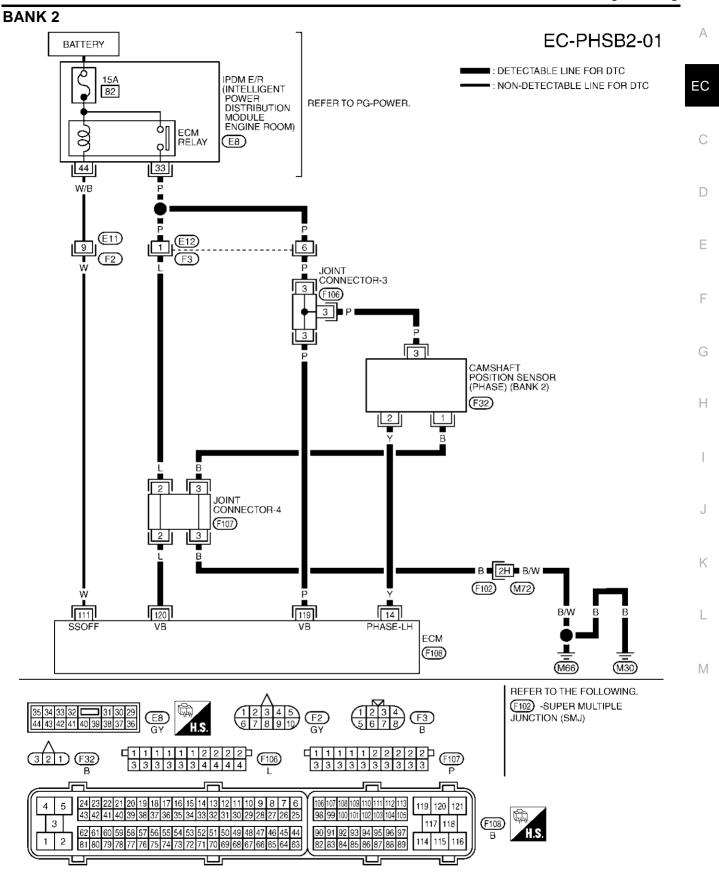
CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
		Camshaft position sensor	[Engine is running]Warm-up conditionIdle speed	1.0 - 4.0V★ >>> 5.0 V/Div 20 ms//Div T PBIB1039E
33	OR	(PHASE) (bank 1)	[Engine is running] ● Engine speed is 2,000 rpm.	1.0 - 4.0V★ → 5.0 V/Div 20 ms/Div PBIB1040E

^{★:} Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

[TYPE 2]



TBWT0421E

Specification data are reference values and are measured between each terminal and ground. Pulse signal is measured by CONSULT-II.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
		Camshaft position sensor	[Engine is running]Warm-up conditionIdle speed	1.0 - 4.0V* 20 5.0 V/Div 20 ms/Div T PBIB1039E
14	Y	(PHASE) (bank 2)	[Engine is running] ● Engine speed is 2,000 rpm.	1.0 - 4.0V* 1.0 - 4.0V* 20 ma/Div PBIB1040E

^{★:} Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

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1. CHECK STARTING SYSTEM

Turn ignition switch to START position.

Does the engine turn over?

Does the starter motor operate?

Yes or No

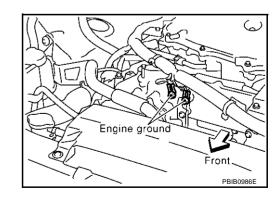
Yes >> GO TO 2.

No >> Check starting system. (Refer to <u>SC-9</u>, "STARTING SYSTEM".)

2. RETIGHTEN GROUND SCREWS

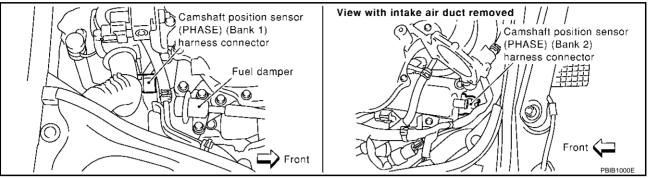
- 1. Turn ignition switch OFF.
- 2. Loosen and retighten engine ground screws.

>> GO TO 3.



3. CHECK CAMSHAFT POSITION (CMP) SENSOR (PHASE) POWER SUPPLY CIRCUIT

1. Disconnect camshaft position (CMP) sensor (PHASE) harness connector.

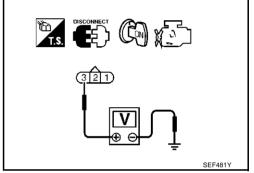


- 2. Turn ignition switch ON.
- Check voltage between CMP sensor (PHASE) terminal 3 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 5. NG >> GO TO 4.



4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Joint connector-3
- Joint connector-4
- Harness for open or short between camshaft position sensor (PHASE) and ECM
- Harness for open or short between camshaft position sensor (PHASE) and IPDM E/R
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK CMP SENSOR (PHASE) GROUND CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- 2. Check harness continuity between CMP sensor (PHASE) terminal 1 and engine ground.

Continuity should exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 7. NG >> GO TO 6.

Revision; 2004 April EC-961 2003 G35 Sedan

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6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F102, M72
- Joint connector-4
- Harness for open or short between CMP sensor (PHASE) and engine ground
 - >> Repair open circuit or short to power in harness or connectors.

7. CHECK CMP SENSOR (PHASE) INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Disconnect ECM harness connector.
- Check harness continuity between ECM terminal 33 or 14 and CMP sensor (PHASE) terminal 2. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 8.

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

8. CHECK CAMSHAFT POSITION SENSOR (PHASE)

Refer to EC-963, "Component Inspection".

OK or NG

OK >> GO TO 9.

NG >> Replace camshaft position sensor (PHASE).

9. CHECK CAMSHAFT (INTAKE)

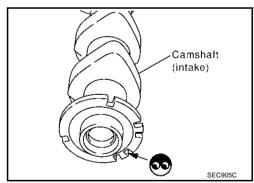
Check the following.

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

OK or NG

OK >> GO TO 10.

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



10. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

DTC P0340, P0345 CMP SENSOR (PHASE)

[TYPE 2]

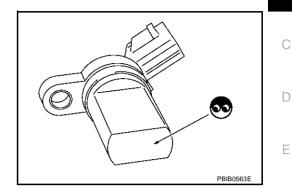
Component Inspection
CAMSHAFT POSITION SENSOR (PHASE)

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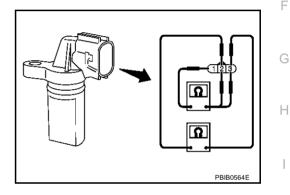
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- 1. Loosen the fixing bolt of the sensor.
- 2. Disconnect camshaft position sensor (PHASE) harness connector.
- 3. Remove the sensor.
- 4. Visually check the sensor for chipping.



5. Check resistance as shown in the figure.

Terminal No. (Polarity)	Resistance Ω [at 25°C (77°F)]
1 (+) - 2 (-)	
1 (+) - 3 (-)	Except 0 or ∞
2 (+) - 3 (-)	



ABS0086H

Removal and Installation CAMSHAFT POSITION SENSOR (PHASE)

Refer to EM-71, "CAMSHAFT".

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Revision; 2004 April EC-963 2003 G35 Sedan

[TYPE 2]

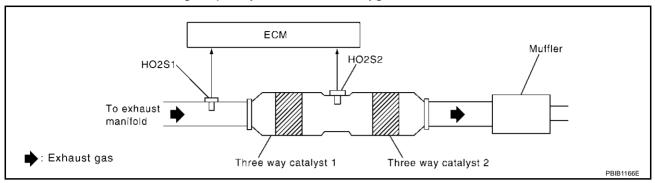
DTC P0420, P0430 THREE WAY CATALYST FUNCTION

PFP:20905

On Board Diagnosis Logic

ABS00861

The ECM monitors the switching frequency ratio of heated oxygen sensors 1 and 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 heated oxygen sensors 1 and 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 0420		Three way catalyst 1 does not operate prop-	Three way catalyst 1 Exhaust tube
(Bank 1)			Intake air leaks
P0430	Catalyst system effi- ciency below threshold	erly.Three way catalyst 1 does not have enough	Fuel injectors
0430 (Bank 2)		oxygen storage capacity.	Fuel injector leaksSpark plug
,			Improper ignition timing

DTC Confirmation Procedure

ABS0086J

NOTE:

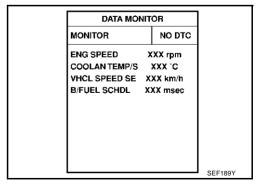
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

(II) WITH CONSULT-II

TESTING CONDITION:

Do not hold engine speed for more than the specified minutes below.

- Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-II.
- 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 minutes.
- 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).
- 7. Open engine hood.



[TYPE 2]

 Select "DTC & SRT CONFIRMATION" then "SRT WORK SUP-PORT" mode with CONSULT-II.

9. Rev engine up to 2,000 to 3,000 rpm and hold it for 3 consecutive minutes then release the accelerator pedal completely. If "INCMP" of "CATALYST" changed to "CMPLT", go to step 12.

10. Wait 5 seconds at idle.

SRT WORK SU	SRT WORK SUPPORT	
CATALYST	INCMP	
EVAP SYSTEM	INCMP	
HO2S HTR	CMPLT	
HO2S	INCMP	
MONITO	٦	
ENG SPEED	XXX rpm	
MAS A/F SE-B1	XXX V	
B/FUEL SCHDL	XXX msec	
A/F ALPHA-B1	XXX V	
COOLAN TEMP/S	XX °C	
HO2S1 (B1)	XXX V	
		SEF940Z

11. Rev engine up to 2,000 to 3,000 rpm and maintain it until "INCMP" of "CATALYST" changes to "CMPLT" (It will take approximately 5 minutes).

If not "CMPLT", stop engine and cool it down to less than 70°C (158°F) and then retest from step 1.

SRT WORK SU	JPPORT	
CATALYST	CMPLT	٦
EVAP SYSTEM	INCMP	ı
HO2S HTR	CMPLT	1
HO2S	INCMP	1
MONITO	R	7
ENG SPEED	XXX rpm	1
MAS A/F SE-B1	XXX V	1
B/FUEL SCHDL	XXX msec	1
A/F ALPHA-B1	XXX V	1
COOLAN TEMP/S	XX °C	1
HO2\$1 (B1)	XXX V	1
		_

12. Select "SELF-DIAG RESULTS" mode with CONSULT-II.

13. Confirm that the 1st trip DTC is not detected.

If the 1st trip DTC is detected, go to EC-966, "Diagnostic Procedure".

SELF DIAG RESU		
DTC RESULTS	TIME	
NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED.		
		SEF535Z

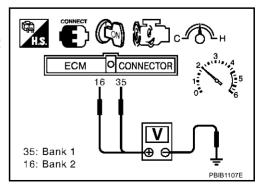
Overall Function Check

ABS0086K

Use this procedure to check the overall function of the three way catalyst 1. During this check, a DTC might not be confirmed.

WITH GST

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 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 minutes.
- 4. Open engine hood.
- Set voltmeters probes between ECM terminals 35 [HO2S1 (bank 1) signal], 16 [HO2S1 (bank 2) signal] and engine ground, and ECM terminals 74 [HO2S2 (bank 1) signal], 55 [HO2S2 (bank 2) signal] and engine ground.
- 6. Keep engine speed at 2,000 rpm constant under no load.



Revision; 2004 April EC-965 2003 G35 Sedan

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[TYPE 2]

 Make sure that the voltage switching frequency (high & low) between ECM terminals 74 and engine ground, or 55 and engine ground is very less than that of ECM terminals 35 and engine ground, or 16 and engine ground.

Switching frequency ratio = A/B

A: Heated oxygen sensor 2 voltage switching frequency B: Heated oxygen sensor 1 voltage switching frequency This ratio should be less than 0.75.

If the ratio is greater than above, it means three way catalyst 1 does not operate properly. Go to $\underline{\text{EC-966}}$, "Diagnostic Procedure".

T4: Bank 1 55: Bank 2 PRIB1108E

NOTE:

If the voltage at terminal 35 or 16 does not switch periodically more than 5 times within 10 seconds at step 7, perform trouble diagnosis for "DTC P0133, P0153" first. (See $\underline{EC-860}$.)

Diagnostic Procedure

ABS0086L

1. CHECK EXHAUST SYSTEM

Visually check exhaust tubes and muffler for dent.

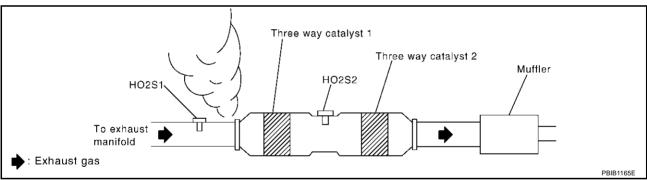
OK or NG

OK >> GO TO 2.

NG >> Repair or replace.

2. CHECK EXHAUST GAS LEAK

- 1. Start engine and run it at idle.
- Listen for an exhaust gas leak before the three way catalyst 1.



OK or NG

OK >> GO TO 3.

NG >> Repair or replace.

3. CHECK INTAKE AIR LEAK

Listen for an intake air leak after the mass air flow sensor.

OK or NG

OK >> GO TO 4.

NG >> Repair or replace.

[TYPE 2]

4. CHECK IGNITION TIMING

Check the following items. Refer to EC-727, "Basic Inspection".

Items	Specifications		
Target idle speed	A/T	650 ± 50 rpm (in P or N position)	
	M/T	650 ± 50 rpm (in N position)	
Ignition timing	A/T	15 ± 5° BTDC (in P or N position)	
	M/T	15 ± 5° BTDC (in N position)	

OK or NG

OK >> GO TO 5.

NG >> Follow the EC-727, "Basic Inspection".

5. CHECK INJECTORS

1. Stop engine and then turn ignition switch ON.

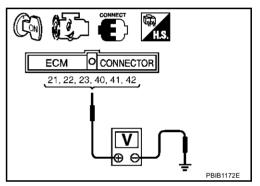
Check voltage between ECM terminals 21, 22, 23, 40, 41, 42 and ground with CONSULT-II or tester.
 Refer to Wiring Diagram for Injectors, EC-1254.

Battery voltage should exist.

OK or NG

OK >> GO TO 6.

NG >> Perform <u>EC-1256</u>, "<u>Diagnostic Procedure</u>" .



6. CHECK IGNITION SPARK

1. Turn ignition switch OFF.

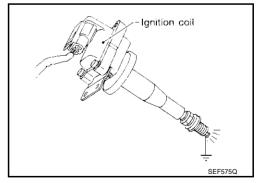
2. Disconnect ignition coil assembly from rocker cover.

- 3. Connect a known-good spark plug to the ignition coil assembly.
- 4. Disconnect injector harness connectors.
- 5. Place end of spark plug against a suitable ground and crank engine.
- 6. Check for spark.

OK or NG

OK >> GO TO 7.

NG >> Check ignition coil with power transistor and their circuit. Refer to EC-1241, "IGNITION SIGNAL".



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[TYPE 2]

7. CHECK INJECTOR

- 1. Turn ignition switch OFF.
- Remove injector assembly.
 Refer to <u>EM-37</u>, "<u>FUEL INJECTOR AND FUEL TUBE</u>".
 Keep fuel hose and all injectors connected to injector gallery.
- 3. Reconnect all injector harness connectors.
- 4. Disconnect all ignition coil harness connectors.
- 5. Turn ignition switch ON.

 Make sure fuel does not drip from injector.

OK or NG

OK (Does not drip.)>>GO TO 8.

NG (Drips.)>>Replace the injector(s) from which fuel is dripping.

8. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

Trouble is fixed.>>INSPECTION END

Trouble is not fixed.>>Replace three way catalyst assembly.

[TYPE 2]

DTC P0441 EVAP CONTROL SYSTEM

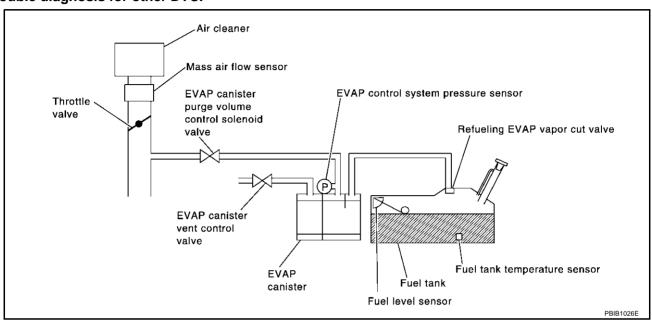
PFP:14950

System Description

ABS0086M

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.

On Board Diagnosis Logic

ABS0086N

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 er 0441 incorrect purge flow int		EVAP canister purge volume control solenoid valve stuck closed	
	EVAP control system does not operate properly, EVAP control system has a leak between intake manifold and EVAP control system pressure sensor.	EVAP control system pressure sensor and the circuit	
		Loose, disconnected or improper con- nection 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

ABS00860

CAUTION:

Always drive vehicle at a safe speed.

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Always perform test at a temperature of 5°C (41°F) or more.

EC-969 Revision; 2004 April 2003 G35 Sedan

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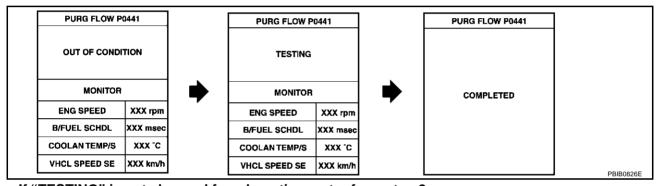
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(P) WITH CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- 2. 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 CONFIRMATION" mode with CON-SULT-II.
- 5. Touch "START". If "COMPLETED" is displayed, go to step 7.
- 6. When the following conditions are met, "TESTING" will be displayed on the CONSULT-II screen. Maintain the conditions continuously until "TESTING" changes to "COMPLETED". (It will take at least 35 seconds.)

Selector lever	Suitable position
Vehicle speed	32 - 120 km/h (20 - 75 MPH)
ENG SPEED	500 - 3,000 rpm
B/FUEL SCHDL	1.3 - 9.0 msec
Engine coolant temperature	70 - 100°C (158 - 212°F)



If "TESTING" is not changed for a long time, retry from step 2.

 Make sure that "OK" is displayed after touching "SELF-DIAG RESULTS". If "NG" is displayed, refer to EC-971, "Diagnostic Procedure".

Overall Function Check

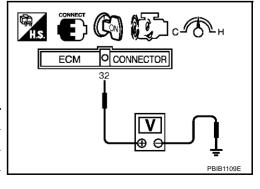
ABS0086P

Use this procedure to check the overall monitoring function of the EVAP control system purge flow monitoring. During this check, a DTC might not be confirmed.

WITH GST

- Lift up drive wheels.
- 2. Start engine (VDC switch OFF) and warm it up to normal operating temperature.
- 3. Turn ignition switch OFF, wait at least 10 seconds.
- 4. Start engine and wait at least 70 seconds.
- 5. Set voltmeter probes to ECM terminals 32 (EVAP control system pressure sensor signal) and ground.
- 6. Check EVAP control system pressure sensor value at idle speed and note it.
- 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



8. Verify that EVAP control system pressure sensor value stays 0.1V less than the value at idle speed (measured at step 6) for at least 1 second.

DTC P0441 EVAP CONTROL SYSTEM

[TYPE 2]

9. If NG, go to EC-971, "Diagnostic Procedure".

Diagnostic Procedure

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1. CHECK EVAP CANISTER

- 1. Turn ignition switch OFF.
- 2. Check EVAP canister for cracks.

OK or NG

OK (With CONSULT-II)>>GO TO 2.

OK (Without CONSULT-II)>>GO TO 3.

NG >> Replace EVAP canister.

2. CHECK PURGE FLOW

(P) With CONSULT-II

- 1. 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-1293, "EVAPORA-TIVE EMISSION LINE DRAWING".
- Start engine and let it idle.
- Select "PURG VOL CONT/V" in "ACTIVE TEST" mode with CONSULT-II.
- Rev engine up to 2,000 rpm.
- 5. Touch "Qd" and "Qu" on CONSULT-II screen to adjust "PURG VOL CONT/V" opening and check vacuum existence.

PURG VOL CONT/V	Vacuum	
100%	Should exist.	
0%	Should not exist.	

OK or NG

OK >> GO TO 7. NG >> GO TO 4.

3. CHECK PURGE FLOW

(R) Without CONSULT-II

- 1. 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 and install vacuum gauge. For the location of EVAP service port, refer to EC-1293, "EVAPORA-TIVE EMISSION LINE DRAWING".
- Start engine and let it idle for at least 80 seconds.
- Check vacuum gauge indication when revving engine up to 2,000 rpm.

Vacuum should exist.

Release the accelerator pedal fully and let idle.

Vacuum should not exist.

OK or NG

OK >> GO TO 7.

NG >> GO TO 4.

EC-971 Revision; 2004 April 2003 G35 Sedan

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4. CHECK EVAP PURGE LINE

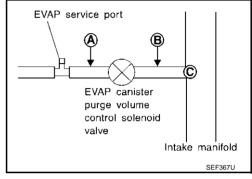
- 1. Turn ignition switch OFF.
- 2. Check EVAP purge line for improper connection or disconnection. Refer to EC-1293, "EVAPORATIVE EMISSION LINE DRAWING".

OK or NG

OK >> GO TO 5. NG >> Repair it.

5. CHECK EVAP PURGE HOSE AND PURGE PORT

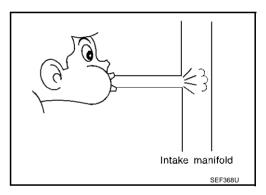
- 1. Disconnect purge hoses connected to EVAP service port **A** and EVAP canister purge volume control solenoid valve **B**.
- 2. Blow air into each hose and EVAP purge port C.



3. Check that air flows freely.

OK or NG

OK (With CONSULT-II)>>GO TO 6.
OK (Without CONSULT-II)>>GO TO 7.
NG >> Repair or clean hoses and/or purge port.



6. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

(P) With CONSULT-II

- 1. Start engine.
- 2. Perform "PURG VOL CONT/V" in "ACTIVE TEST" mode with CONSULT-II. Check that engine speed varies according to the valve opening.

OK or NG

OK >> GO TO 8. NG >> GO TO 7.

ACTIVE TE	ACTIVE TEST	
PURG VOL CONT/V	0 %	
MONITOR	MONITOR	
ENG SPEED	XXX rpm	
HO2S1 MNTR (B1)	LEAN	
HO2S1 MNTR (B2)	LEAN	
A/F ALPHA-B1	XXX %	
A/F ALPHA-B2	XXX %	
		PBIB0147E

7. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-989, "Component Inspection".

OK or NG

OK >> GO TO 8.

NG >> Replace EVAP canister purge volume control solenoid valve.

DTC P0441 EVAP CONTROL SYSTEM

[TYPE 2]

8. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR CONNECTOR Disconnect EVAP control system pressure sensor harness connector. Check connectors for water. EC Water should not exist. OK or NG >> GO TO 9. OK NG >> Replace EVAP control system pressure sensor. 9. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR FUNCTION Refer to DTC Confirmation Procedure for DTC P0452 EC-1002 . P0453 EC-1008 . OK or NG F OK >> GO TO 10. NG >> 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. OK or NG OK >> GO TO 11. NG >> Clean the rubber tube using an air blower. Н 11. CHECK EVAP CANISTER VENT CONTROL VALVE Refer to EC-996, "Component Inspection". OK or NG OK >> GO TO 12. NG >> 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-1293, "EVAPORATIVE EMISSION LINE DRAWING". OK or NG OK >> GO TO 13. NG >> Replace it. 13. CLEAN EVAP PURGE LINE M Clean EVAP purge line (pipe and rubber tube) using air blower. >> GO TO 14.

14. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

DTC P0442 EVAP CONTROL SYSTEM

PFP:14950

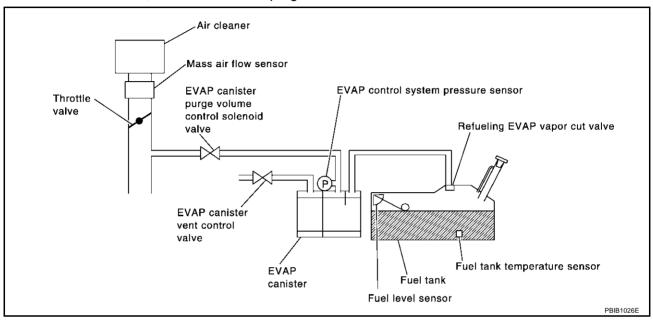
On Board Diagnosis Logic

ARSOORER

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 vol-

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	А
			Incorrect fuel tank vacuum relief valve	•
			Incorrect fuel filler cap used	
			Fuel filler cap remains open or fails to close.	EC
			Foreign matter caught in fuel filler cap.	
			Leak is in line between intake manifold and EVAP canister purge volume control solenoid valve.	С
			Foreign matter caught in EVAP canister vent control valve.	D
			EVAP canister or fuel tank leaks	
	EVAP control system small leak detected	leak detected control system does not operate prop-	EVAP purge line (pipe and rubber tube) leaks	
			EVAP purge line rubber tube bent	Е
P0442			Blocked or bent rubber tube to EVAP control system pressure sensor	
0442	(negative pressure)		Loose or disconnected rubber tube	F
			EVAP canister vent control valve and the circuit	
			EVAP canister purge volume control solenoid valve and the circuit	G
			Fuel tank temperature sensor	
			O-ring of EVAP canister vent control valve is missing or damaged	Н
			Water separator	
			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	J

CAUTION:

- Use only a genuine NISSAN fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the MIL may come on.
- If the fuel filler cap is not tightened properly, the MIL may come on.
- Use only a genuine NISSAN rubber tube as a replacement.

DTC Confirmation Procedure

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NOTE:

• If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

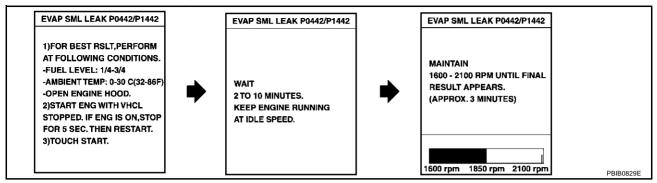
- Perform "DTC WORK SUPPORT" when the fuel level is between 1/4 and 3/4 full, and vehicle is placed on flat level surface.
- Always perform test at a temperature of 0 to 30°C (32 to 86°F).

(WITH CONSULT-II

- 1. 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-II.
- 4. Make sure 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 "EVAP SML LEAK P0442/P1442" of "EVAPORATIVE SYSTEM" in "DTC WORK SUPPORT" mode with CONSULT-II. Follow the instruction displayed.



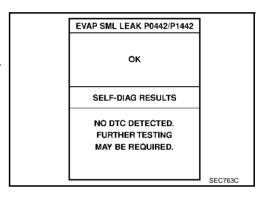
NOTE:

If the engine speed cannot be maintained within the range displayed on the CONSULT-II screen, go to EC-727, "Basic Inspection".

Make sure that "OK" is displayed.
 If "NG" is displayed, refer to <u>EC-977, "Diagnostic Procedure"</u>.

NOTE:

Make sure that EVAP hoses are connected to EVAP canister purge volume control solenoid valve properly.



WITH GST

NOTE:

Be sure to read the explanation of Driving Pattern on <u>EC-707</u> before driving vehicle.

- 1. Start engine.
- 2. Drive vehicle according to <a>EC-707, "Driving Pattern".
- Stop vehicle.
- 4. Select "MODE 1" with GST.
 - If SRT of EVAP system is not set yet, go to the following step.
 - If SRT of EVAP system is set, the result will be OK.
- 5. Turn ignition switch OFF and wait at least 10 seconds.
- Start engine.

It is not necessary to cool engine down before driving.

- 7. Drive vehicle again according to EC-707, "Driving Pattern".
- 8. Stop vehicle.
- 9. Select "MODE 3" with GST.
 - If P0442 is displayed on the screen, go to EC-977, "Diagnostic Procedure".
 - If P0441 is displayed on the screen, go to Diagnostic Procedure for DTC P0441, EC-971.
 - If P0441 and P0442 are not displayed on the screen, go to the following step.
- 10. Select "MODE 1" with GST.
 - If SRT of EVAP system is set, the result will be OK.
 - If SRT of EVAP system is not set, go to step 6.

DTC P0442 EVAP CONTROL SYSTEM

[TYPE 2]

Diagnostic Procedure

1. CHECK FUEL FILLER CAP DESIGN

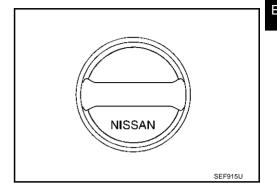
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- 1. Turn ignition switch OFF.
- 2. Check for genuine NISSAN fuel filler cap design.

OK or NG

OK >> GO TO 2.

NG >> 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.

OK or NG

OK >> GO TO 3.

NG >> 1. Open fuel filler cap, then clean cap and fuel filler neck threads using air blower.

2. Retighten until ratcheting sound is heard.

3. CHECK FUEL FILLER CAP FUNCTION

Check for air releasing sound while opening the fuel filler cap.

OK or NG

OK >> GO TO 5.

NG >> GO TO 4.

4. CHECK FUEL TANK VACUUM RELIEF VALVE

Refer to EC-1295, "FUEL TANK VACUUM RELIEF VALVE (BUILT INTO FUEL FULLER CAP)".

OK or NG

OK >> GO TO 5.

NG >> Replace fuel filler cap with a genuine one.

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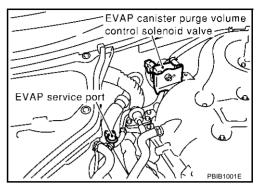
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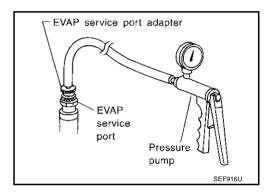
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5. INSTALL THE PRESSURE PUMP

To locate the EVAP leak, install EVAP service port adapter and pressure pump to EVAP service port securely. For the location of EVAP service port, refer to EC-1293, "EVAPORATIVE EMISSION LINE <a href="DRAWING".





NOTE:

Improper installation of the EVAP service port adapter to the EVAP service port may cause leaking.

Models with CONSULT-II>>GO TO 6. Models without CONSULT-II>>GO TO 7.

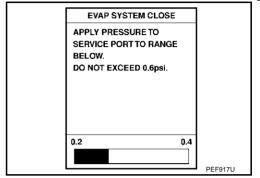
6. CHECK FOR EVAP LEAK

(II) With CONSULT-II

- 1. Turn ignition switch ON.
- Select "EVAP SYSTEM CLOSE" of "WORK SUPPORT" mode with CONSULT-II.
- 3. Touch "START" and apply pressure into the EVAP line until the pressure indicator reaches the middle of the bar graph.

NOTE:

- Never use compressed air or a high pressure pump.
- Do not exceed 4.12 kPa (0.042 kg/cm², 0.6 psi) of pressure in the system.

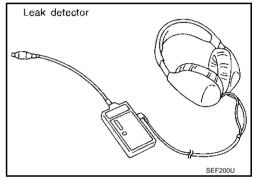


 Using EVAP leak detector, locate the EVAP leak. For the leak detector, refer to the instruction manual for more details. Refer to <u>EC-1293</u>, "EVAPORATIVE EMISSION LINE DRAW-<u>ING"</u>.

OK or NG

OK >> GO TO 8.

NG >> Repair or replace.



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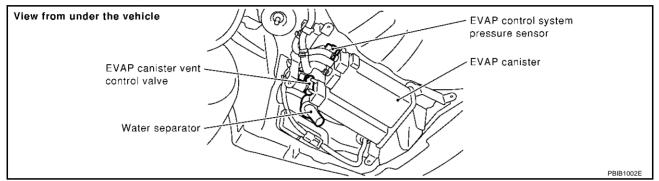
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7. CHECK FOR EVAP LEAK

(R) Without CONSULT-II

- 1. Turn ignition switch OFF.
- 2. Apply 12 volts DC to EVAP canister vent control valve. The valve will close. (Continue to apply 12 volts until the end of test.)



3. Pressurize the EVAP line using pressure pump with 1.3 to 2.7 kPa (10 to 20 mmHg, 0.39 to 0.79 inHg), then remove pump and EVAP service port adapter.

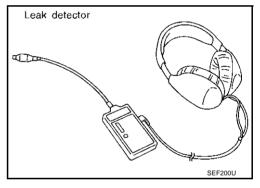
NOTE:

- Never use compressed air or a high pressure pump.
- Do not exceed 4.12 kPa (0.042 kg/cm², 0.6 psi) of pressure in the system.
- 4. Using EVAP leak detector, locate the EVAP leak. For the leak detector, refer to the instruction manual for more details. Refer to EC-1293, "EVAPORATIVE EMISSION LINE DRAWING".

OK or NG

OK >> GO TO 8.

NG >> Repair or replace.



8. CHECK WATER SEPARATOR

Refer to EC-983, "Component Inspection".

OK or NG

OK >> GO TO 9.

NG >> Replace water separator.

9. CHECK EVAP CANISTER VENT CONTROL VALVE

Check the following.

- EVAP canister vent control valve is installed properly.
 Refer to <u>EC-1296</u>, "Removal and Installation".
- EVAP canister vent control valve.
 Refer to <u>EC-996</u>, "Component Inspection".

OK or NG

OK >> GO TO 10.

NG >> Repair or replace EVAP canister vent control valve and O-ring.

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10. CHECK IF EVAP CANISTER SATURATED WITH WATER

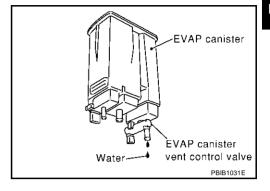
- Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached
- 2. Does water drain from the EVAP canister?

Yes or No

Yes >> GO TO 11.

No (With CONSULT-II)>>GO TO 13.

No (Without CONSULT-II)>>GO TO 14.



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).

OK or NG

OK (With CONSULT-II)>>GO TO 13.

OK (Without CONSULT-II)>>GO TO 14.

>> GO TO 12.

12. DETECT MALFUNCTIONING PART

Check the following.

- EVAP canister for damage
- EVAP hose between EVAP canister and water separator for clogging or poor connection

>> Repair hose or replace EVAP canister.

13. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

(P) With CONSULT-II

- Disconnect vacuum hose to EVAP canister purge volume control solenoid valve at EVAP service port.
- Start engine.
- Perform "PURG VOL CONT/V" in "ACTIVE TEST" mode.
- Touch "Qu" on CONSULT-II screen to increase "PURG VOL CONT/V" opening to 100%.
- Check vacuum hose for vacuum when revving engine up to 2,000 rpm.

OK or NG

OK >> GO TO 16.

NG >> GO TO 15.

ACTIVE TEST		
PURG VOL CONT/V	0 %	
MONITOR		
ENG SPEED	XXX rpm	
HO2S1 MNTR (B1)	LEAN	
HO2S1 MNTR (B2)	LEAN	
A/F ALPHA-B1	XXX %	
A/F ALPHA-B2	XXX %	
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Revision; 2004 April

14. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

(R) Without CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- 2. Stop engine.
- Disconnect vacuum hose 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.

OK or NG

OK >> GO TO 16. NG >> GO TO 15.

15. CHECK VACUUM HOSE

Check vacuum hoses for clogging or disconnection. Refer to EC-670, "Vacuum Hose Drawing".

OK or NG

OK >> GO TO 16.

NG >> Repair or reconnect the hose.

16. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-989, "Component Inspection".

OK or NG

OK >> GO TO 17.

NG >> Replace EVAP canister purge volume control solenoid valve.

17. CHECK FUEL TANK TEMPERATURE SENSOR

Refer to EC-926, "Component Inspection".

OK or NG

OK >> GO TO 18.

NG >> Replace fuel level sensor unit.

18. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-1006, "Component Inspection".

OK or NG

OK >> GO TO 19.

NG >> Replace EVAP control system pressure sensor.

19. CHECK EVAP PURGE LINE

Check EVAP purge line (pipe, rubber tube, fuel tank and EVAP canister) for cracks or improper connection. Refer to EC-1293, "EVAPORATIVE EMISSION LINE DRAWING".

OK or NG

OK >> GO TO 20.

NG >> Repair or reconnect the hose.

20. CLEAN EVAP PURGE LINE

Clean EVAP purge line (pipe and rubber tube) using air blower.

>> GO TO 21.

DTC P0442 EVAP CONTROL SYSTEM

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21. CHECK EVAP/ORVR LINE

Check EVAP/ORVR line between EVAP canister and fuel tank for clogging, kink, looseness and improper connection. For location, refer to EC-1299, "ON BOARD REFUELING VAPOR RECOVERY (ORVR)".

OK or NG

OK >> GO TO 22.

NG >> Repair or replace hoses and tubes.

22. CHECK RECIRCULATION LINE

Check recirculation line between filler neck tube and fuel tank for clogging, kink, cracks, looseness and improper connection.

OK or NG

OK >> GO TO 23.

NG >> Repair or replace hose, tube or filler neck tube.

23. CHECK REFUELING EVAP VAPOR CUT VALVE

Refer to EC-1303, "REFUELING EVAP VAPOR CUT VALVE".

OK or NG

OK >> GO TO 24.

NG >> Replace refueling EVAP vapor cut valve with fuel tank.

24. CHECK FUEL LEVEL SENSOR

Refer to DI-21. "FUEL LEVEL SENSOR UNIT CHECK".

OK or NG

OK >> GO TO 25.

NG >> Replace fuel level sensor unit.

25. CHECK INTERMITTENT INCIDENT

Refer to EC-780. "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

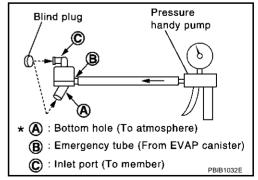
>> INSPECTION END

Component Inspection WATER SEPARATOR

1. Check visually for insect nests in the water separator air inlet.

- 2. Check visually for cracks or flaws in the appearance.
- Check visually for cracks or flaws in the hose.
- Check that **A** and **C** are not clogged by blowing air into **B** with A, and then C plugged.
- 5. In case of NG in items 2 4, replace the parts.

Do not disassemble water separator.



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2003 G35 Sedan

[TYPE 2]

DTC P0444, P0445 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID **VALVE**

PFP:14920

Description SYSTEM DESCRIPTION

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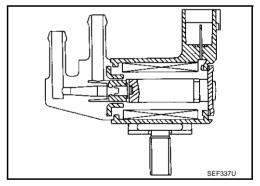
Sensor	Input Signal to ECM	ECM function	Actuator	
Crankshaft position sensor (POS) Camshaft position sensor (PHASE)	Engine speed *1			
Mass air flow sensor	Amount of intake air			
Engine coolant temperature sensor	Engine coolant temperature			
Battery	Battery voltage*1			
Throttle position sensor	Throttle position		EVAP canister purge vol- ume control solenoid valve	
Accelerator pedal position sensor	Accelerator pedal position			
Heated oxygen sensors 1	Density of oxygen in exhaust gas (Mixture ratio feedback signal)			
Fuel tank temperature sensor	Fuel temperature in fuel tank			
Vehicle speed signal*2	Vehicle speed			

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

This system controls flow rate of fuel vapor from the EVAP canister. The opening of the vapor by-pass passage in the EVAP canister purge volume control solenoid valve changes to control the flow rate. The EVAP canister purge volume control solenoid valve repeats ON/OFF operation according to the signal sent from the ECM. The opening of the valve varies for optimum engine control. The optimum value stored in the ECM is determined by considering various engine conditions. When the engine is operating, the flow rate of fuel vapor from the EVAP canister is regulated as the air flow changes.

COMPONENT DESCRIPTION

The EVAP canister purge volume control solenoid valve uses a ON/ OFF duty 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.



CONSULT-II Reference Value in Data Monitor Mode

ABS0086V

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
	Engine: After warming up	Idle	0%
PURG VOL C/V	Shift lever: N (A/T), Neutral (M/T)Air conditioner switch: OFFNo-load	2,000 rpm	_

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

[TYPE 2]

On Board Diagnosis Logic

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DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0444 0444	EVAP canister purge volume control solenoid valve circuit	An excessively low voltage signal is sent to ECM through the valve	Harness or connectors (The solenoid valve circuit is open or shorted.)
	open	to ECM through the valve	EVAP canister purge volume control solenoid valve
P0445	EVAP canister purge volume control solenoid valve circuit shorted	An aycassivaly high voltage signal is sent	Harness or connectors (The solenoid valve circuit is shorted.)
0445		to ECM through the valve	EVAP canister purge volume control solenoid valve

DTC Confirmation Procedure

ABS0086X

NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Before performing the following procedure, confirm battery voltage is more than 11V at idle.

(A) WITH CONSULT-II

- 1. Turn ignition switch ON.
- Select "DATA MONITOR" mode with CONSULT-II.
- 3. Start engine and let it idle for at least 13 seconds.
- 4. If 1st trip DTC is detected, go to EC-988, "Diagnostic Procedure"

DATA M	ONITOR
MONITOR NO DTC	
ENG SPEED	XXX rpm

® WITH GST

Follow the procedure "WITH CONSULT-II" above.

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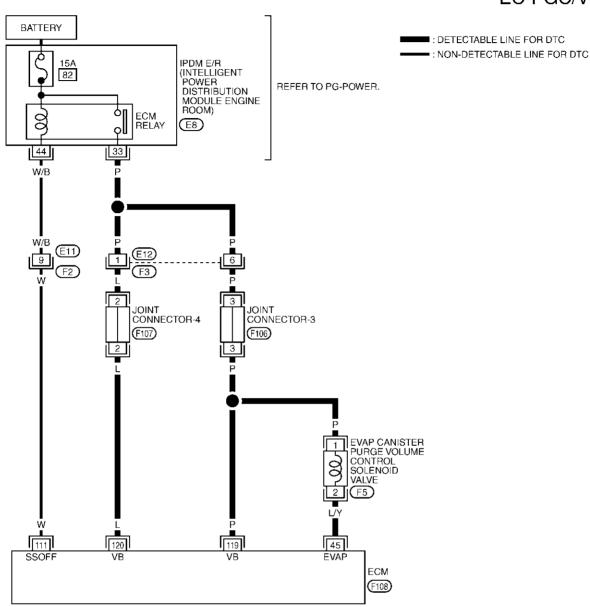
Revision; 2004 April EC-985 2003 G35 Sedan

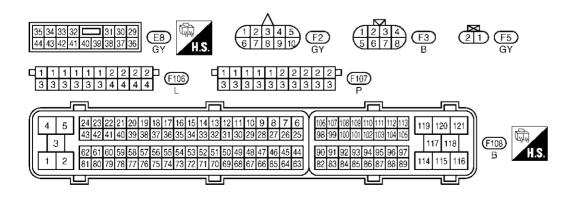
[TYPE 2]

Wiring Diagram

ABS0086

EC-PGC/V-01





TBWT0422E

[TYPE 2]

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Specification data are reference values and are measured between each terminal and ground. Pulse signal is measured by CONSULT-II.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
45 L M		EVAP canister purge vol-	[Engine is running] • Idle speed	BATTERY VOLTAGE (11 - 14V)*
45	L/W	ume control solenoid valve	 [Engine is running] ● Engine speed is about 2,000 rpm (More than 100 seconds after starting engine). 	BATTERY VOLTAGE (11 - 14V)* Indication Indication
111 W	W	V ECM relay (Self shut-off)	[Engine is running] [Ignition switch: OFF] • For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF]A few seconds passed after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
119 120	P L	Power supply for ECM	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14V)

^{★:} Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

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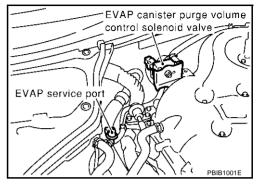
[TYPE 2]

Diagnostic Procedure

ABS00867

1. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE POWER SUPPLY CIR-

- 1. Turn ignition switch OFF.
- 2. Disconnect EVAP canister purge volume control solenoid valve harness connector.
- 3. Turn ignition switch ON.

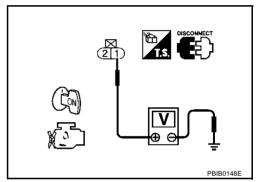


Check voltage between EVAP canister purge volume control solenoid valve terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 3. NG >> GO TO 2.



2. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Joint connector-3
- Joint connector-4
- 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 harness or connectors.

3. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OUTPUT SIGNAL CIR-CUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- Disconnect ECM harness connector.
- 3. Check harness continuity between ECM terminal 45 and EVAP canister purge volume control solenoid valve terminal 2. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK (With CONSULT-II)>>GO TO 4.

OK (Without CONSULT-II)>>GO TO 5.

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

[TYPE 2]

4. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

(II) With CONSULT-II

- 1. Reconnect all harness connectors disconnected.
- 2. Start engine.
- 3. Perform "PURG VOL CONT/V" in "ACTIVE TEST" mode with CONSULT-II. Check that engine speed varies according to the valve opening.

OK or NG

OK >> GO TO 6. NG >> GO TO 5.

ACTIVE TES	ACTIVE TEST	
PURG VOL CONT/V	0 %	
MONITOR	MONITOR	
ENG SPEED	XXX rpm	
HO2S1 MNTR (B1)	LEAN	
HO2S1 MNTR (B2)	LEAN	
A/F ALPHA-B1	XXX %	
A/F ALPHA-B2	XXX %	
	<u> </u>	PBIB0147E

5. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-989, "Component Inspection".

OK or NG

OK >> GO TO 6.

NG >> Replace EVAP canister purge volume control solenoid valve.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

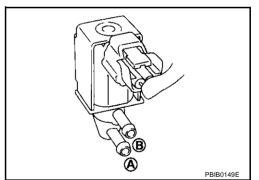
>> INSPECTION END

Component Inspection EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

(A) With CONSULT-II

Check air passage continuity of EVAP canister purge volume control solenoid valve under the following conditions.

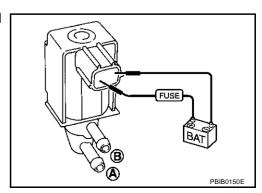
Condition (PURG VOL CONT/V value)	Air passage continuity between A and B
100%	Yes
0%	No



Without CONSULT-II

Check air passage continuity of EVAP canister purge volume control solenoid valve under the following conditions.

Condition	Air passage continuity between A and B
12V direct current supply between terminals 1 and 2	Yes
No supply	No



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[TYPE 2]

Removal and Installation
EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EM-18, "INTAKE MANIFOLD COLLECTOR".

ABS00871

PFP:14935

Component Description

ABS00872

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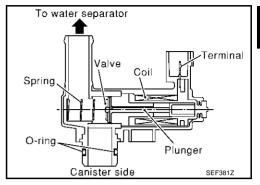
Н

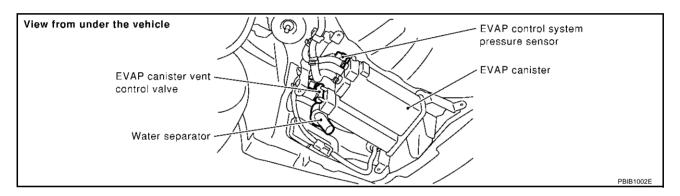
The EVAP canister vent control valve is located on the EVAP canister and is used to seal the canister vent.

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.





CONSULT-II Reference Value in Data Monitor Mode

ABS00873

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
VENT CONT/V	Ignition switch: ON	OFF

On Board Diagnosis Logic

ABS00874

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0447 0447	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

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[TYPE 2]

DTC Confirmation Procedure

ABS00875

NOTE:

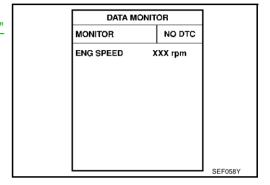
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Before performing the following procedure, confirm battery voltage is more than 11V at idle.

(P) WITH CONSULT-II

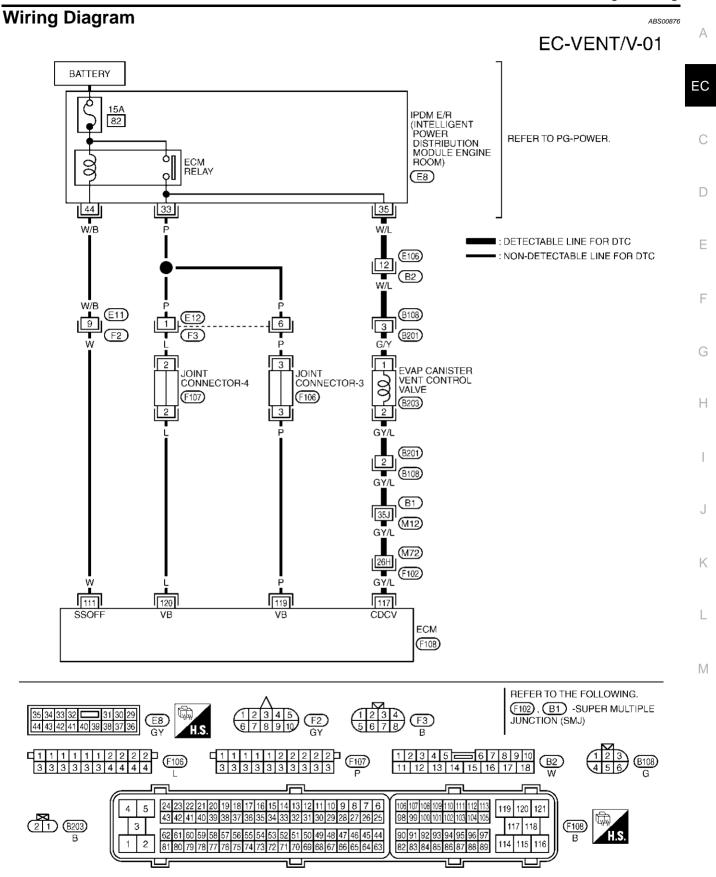
- 1. Turn ignition switch ON.
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- 3. Start engine and wait at least 8 seconds.
- 4. If 1st trip DTC is detected, go to EC-994, "Diagnostic Procedure"



WITH GST

Follow the procedure "WITH CONSULT-II" above.

[TYPE 2]



TBWT0423E

[TYPE 2]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
111	W	ECM relay (Self shut-off)	[Engine is running] [Ignition switch: OFF] • For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF]A few seconds passed after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
117	GY/L	EVAP canister vent control valve	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14V)
119 120	P L	Power supply for ECM	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

ABS00877

1. INSPECTION START

Do you have CONSULT-II?

Yes or No

Yes >> GO TO 2. No >> GO TO 3.

2. CHECK EVAP CANISTER VENT CONTROL VALVE CIRCUIT

(II) With CONSULT-II

- 1. Turn ignition switch OFF and then turn ON.
- 2. Select "VENT CONTROL/V" in "ACTIVE TEST" mode with CONSULT-II.
- 3. Touch "ON/OFF" on CONSULT-II screen.
- 4. Check for operating sound of the valve. Clicking noise should be heard.

OK or NG

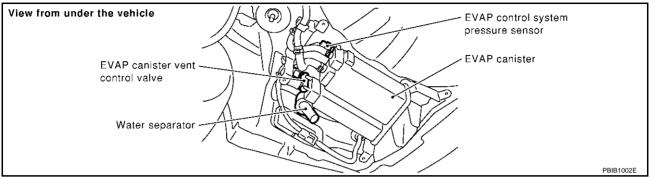
OK >> GO TO 7. NG >> GO TO 3.

ACTIVE TEST		
VENT CONTROL/V	OFF	
MONITOR	}	
ENG SPEED	XXX rpm	
A/F ALPHA-B1	XXX %	
A/F ALPHA-B2	xxx %	
HO2S1 (B1)	xxx v	
HO2S1 (B2)	xxx v	
	1	PBIB0151E

[TYPE 2]

3. CHECK EVAP CANISTER VENT CONTROL VALVE POWER SUPPLY CIRCUIT

- 1. Turn ignition switch OFF.
- Disconnect EVAP canister vent control valve harness connector.

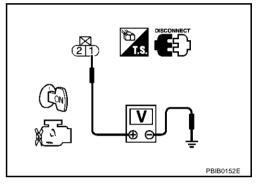


- 3. Turn ignition switch ON.
- 4. Check voltage between EVAP canister vent control valve terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 5. NG >> GO TO 4.



4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E106, B2
- Harness connectors B108, B201
- Harness for open or short between EVAP canister vent control valve and IPDM E/R
 - >> Repair harness or connectors.

5. CHECK EVAP CANISTER VENT CONTROL VALVE OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- Disconnect ECM harness connector.
- Check harness continuity between ECM terminal 117 and EVAP canister vent control valve terminal 2. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 7.

NG >> GO TO 6.

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[TYPE 2]

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B201, B108
- Harness connectors B1, M12
- Harness connectors M72, F102
- Harness for open or short between EVAP canister vent control valve and ECM
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK RUBBER TUBE FOR CLOGGING

- 1. Disconnect rubber tube connected to EVAP canister vent control valve.
- 2. Check the rubber tube for clogging.

OK or NG

OK >> GO TO 8.

NG >> Clean the rubber tube using an air blower.

8. CHECK EVAP CANISTER VENT CONTROL VALVE

Refer to EC-996, "Component Inspection".

OK or NG

OK >> GO TO 9.

NG >> Replace EVAP canister vent control valve.

9. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

Component Inspection EVAP CANISTER VENT CONTROL VALVE

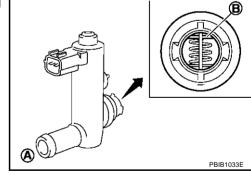
ABS00878

(P) With CONSULT-II

- 1. Remove EVAP canister vent control valve from EVAP canister.
- Check portion B of EVAP canister vent control valve for being rusted.

If NG, replace EVAP canister vent control valve.

- If OK, go to next step.
- Reconnect harness connectors disconnected.
- 4. Turn ignition switch ON.



[TYPE 2]

PBIB0151E

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- 5. Perform "VENT CONTROL/V" in "ACTIVE TEST" mode.
- 6. Check air passage continuity and operation delay time.

 Make sure new O-ring is installed properly.

Condition VENT CONTROL/V	Air passage continuity between A and B
ON	No
OFF	Yes

and B	

 VENT CONTROL/V
 OFF

 MONITOR
 XXX rpm

 ENG SPEED
 XXX rpm

 A/F ALPHA-B1
 XXX %

 A/F ALPHA-B2
 XXX %

 HO2S1 (B1)
 XXX V

 HO2S1 (B2)
 XXX V

ACTIVE TEST

Operation takes less than 1 second.

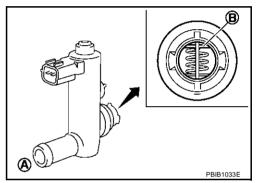
If NG, replace EVAP canister vent control valve.

If OK, go to next step.

- 7. Clean the air passage (Portion A to B) of EVAP canister vent control valve using an air blower.
- 8. Perform step 6 again.

⊗ Without CONSULT-II

- 1. Remove EVAP canister vent control valve from EVAP canister.
- 2. Check portion **B** of EVAP canister vent control valve for being rusted.



 Check air passage continuity and operation delay time under the following conditions.

Make sure new O-ring is installed properly.

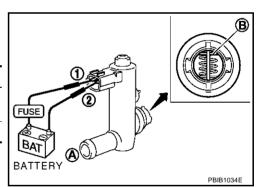
Condition	Air passage continuity between A and B
12V direct current supply between terminals 1 and 2	No
OFF	Yes



If NG, replace EVAP canister vent control valve.

If OK, go to next step.

- 4. Clean the air passage (Portion A to B) of EVAP canister vent control valve using an air blower.
- 5. Perform step 3 again.



2003 G35 Sedan

Revision; 2004 April

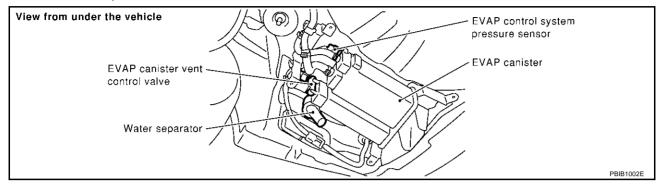
EC-997

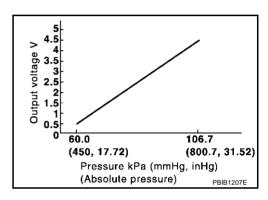
PFP:22365

Component Description

ABS00879

The EVAP control system pressure sensor detects pressure in the purge line. The sensor output voltage to the ECM increases as pressure increases.





CONSULT-II Reference Value in Data Monitor Mode

ABS0087A

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
EVAP SYS PRES	Ignition switch: ON	Approx. 1.8 - 4.8V

On Board Diagnosis Logic

ABS0087B

NOTE

If DTC P0451 is displayed with DTC P1229, first perform the trouble diagnosis for DTC P1229. Refer to $\overline{\text{EC-1151}}$.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0451 0451	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

[TYPE 2]

DTC Confirmation Procedure

ABS00870

NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

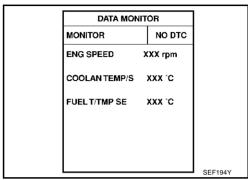
(A) WITH CONSULT-II

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-II.
- 3. Start engine and wait at least 40 seconds.

NOTE:

Do not depress accelerator pedal even slightly.

If 1st trip DTC is detected, go to EC-999, "Diagnostic Procedure"



® WITH GST

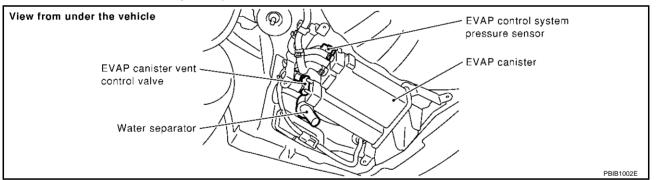
Follow the procedure "WITH CONSULT-II" above.

Diagnostic Procedure

ABS0087D

1. CHECK EVPA CONTROL SYSTEM PRESSURE SENSOR CONNECTOR FOR WATER

Disconnect EVAP control system pressure sensor harness connector.



Check sensor harness connector for water.

Water should not exist.

OK or NG

OK >> GO TO 2.

NG >> Repair or replace harness connector.

2. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-1000, "Component Inspection".

OK or NG

OK >> GO TO 3.

NG >> Replace EVAP control system pressure sensor.

3. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT". For wiring diagram, refer to EC-1003.

>> INSPECTION END

EC-999 Revision; 2004 April 2003 G35 Sedan

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[TYPE 2]

Component Inspection EVAP CONTROL SYSTEM PRESSURE SENSOR

ABS0087E

- 1. Remove EVAP control system pressure sensor with its harness connector connected.
- 2. Remove EVAP control system pressure sensor from EVAP canister. **Do not reuse the O-ring, replace it 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 terminal 32 and ground under the following conditions.

Applied vacuum kPa (mmHg, inHg)	Voltage V	
Not applied	1.8 - 4.8	
-26.7 (-200, -7.87)	2.1 to 2.5V lower than above value	

EVAP control system pressure sensor Pump Pump Pump

CAUTION:

- Always calibrate the vacuum pump gauge when using it.
- Do not apply below -93.3 kPa (-700 mmHg, -27.56 inHg) or pressure over 101.3 kPa (760 mmHg, 29.92 inHg).
- 5. If NG, replace EVAP control system pressure sensor.

[TYPE 2]

DTC P0452 EVAP CONTROL SYSTEM PRESSURE SENSOR

PFP:25085

Component Description

ABS0087F

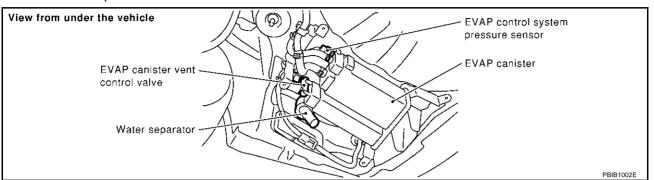
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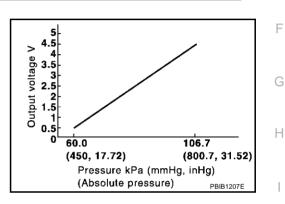
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The EVAP control system pressure sensor detects pressure in the purge line. The sensor output voltage to the ECM increases as pressure increases.





CONSULT-II Reference Value in Data Monitor Mode

ABS0087G

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
EVAP SYS PRES	Ignition switch: ON	Approx. 1.8 - 4.8V

On Board Diagnosis Logic

ABS0087H

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NOTE:

If DTC P0452 is displayed with DTC P1229, first perform the trouble diagnosis for DTC P1229. Refer to $\overline{\text{EC-1151}}$.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0452 0452	EVAP control system pressure sensor low input	An excessively low voltage from the sensor is sent to ECM.	 Harness or connectors (The sensor circuit is open or shorted.) EVAP control system pressure sensor

[TYPE 2]

DTC Confirmation Procedure

ARS0087

NOTE:

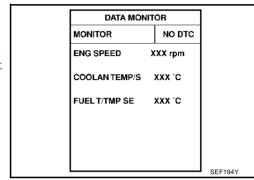
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Always perform test at a temperature of 5°C (41°F) or more.

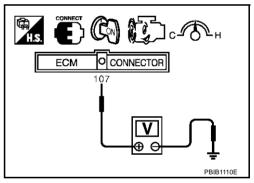
(P) WITH CONSULT-II

- 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. Select "DATA MONITOR" mode with CONSULT-II.
- 5. Make sure that "FUEL T/TEMP SE" is more than 0°C (32°F).
- Start engine and wait at least 20 seconds.
 If 1st trip DTC is detected, go to <u>EC-1004</u>, "<u>Diagnostic Procedure</u>".

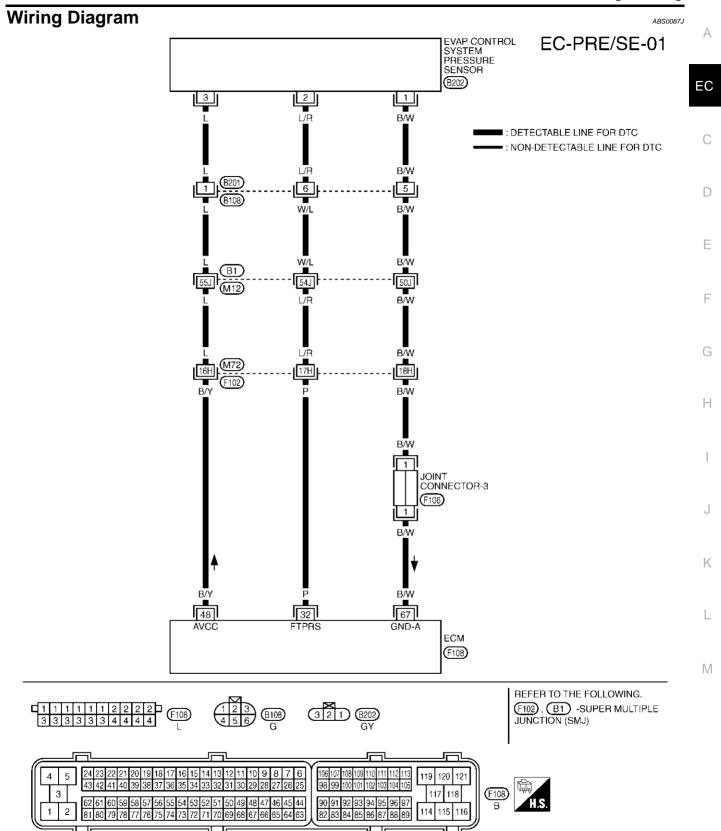


WITH GST

- 1. Start engine and warm it up to normal operating temperature.
- 2. Check that voltage between ECM terminal 107 (Fuel tank temperature sensor signal) and ground is less than 4.2V.
- 3. Turn ignition switch OFF and wait at least 10 seconds.
- Start engine and wait at least 20 seconds.
- Select "MODE 7" with GST.
 If 1st trip DTC is detected, go to <u>EC-1004, "Diagnostic Procedure"</u>.



[TYPE 2]



TBWT0424E

[TYPE 2]

ABS0087K

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

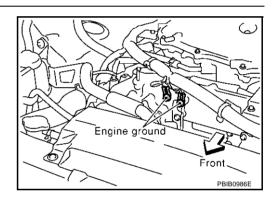
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
32	Р	EVAP control system pressure sensor	[Ignition switch: ON]	Approximately 1.8 - 4.8V
48	B/Y	Sensors' power supply (EVAP control system pressure sensor)	[Ignition switch: ON]	Approximately 5V
67	B/W	Sensors' ground (Mass air flow sensor / IAT sensor / Power steering pressure sensor / EVAP control system pressure sensor)	[Engine is running] • Warm-up condition • Idle speed	Approximately 0V

Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

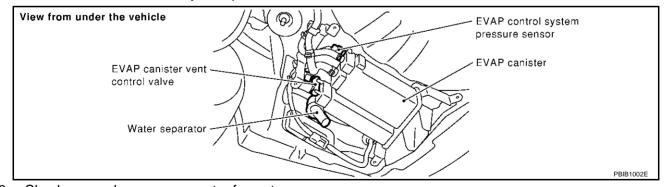
Loosen and retighten engine ground screws.

>> GO TO 2.



2. CHECK CONNECTOR

1. Disconnect EVAP control system pressure sensor harness connector.



Check sensor harness connector for water.

Water should not exist.

OK or NG

OK >> GO TO 3.

NG >> Repair or replace harness connector.

[TYPE 2]

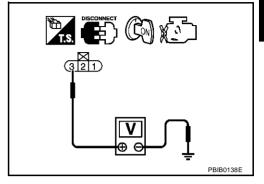
3. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT

- 1. Turn ignition switch ON.
- 2. Check voltage between EVAP control system pressure sensor terminal 3 and ground with CONSULT-II or tester.

Voltage: Approximately 5V

OK or NG

OK >> GO TO 5. NG >> GO TO 4.



4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B201, B108
- Harness connectors B1, M12
- Harness connectors M72, F102
- Harness for open or short between EVAP control system pressure sensor and ECM
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check harness continuity between EVAP control system pressure sensor terminal 1 and ECM terminal 67.

Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 7. NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B201, B108
- Harness connectors B1, M12
- Harness connectors M72, F102
- Joint connector-3

Revision; 2004 April

- Harness for open or short between EVAP control system pressure sensor and ECM
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

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[TYPE 2]

7. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

 Check harness continuity between ECM terminal 32 and EVAP control system pressure sensor terminal 2.

Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 9. NG >> GO TO 8.

8. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B201, B108
- Harness connectors B1, M12
- Harness connectors M72, F102
- Harness for open or short between EVAP control system pressure sensor and ECM
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

9. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-1006, "Component Inspection".

OK or NG

OK >> GO TO 10.

NG >> Replace EVAP control system pressure sensor.

10. CHECK INTERMITTENT INCIDENT

Refer to EC-780. "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

Component Inspection EVAP CONTROL SYSTEM PRESSURE SENSOR

ABS0087L

- 1. Remove EVAP control system pressure sensor with its harness connector connected.
- Remove EVAP control system pressure sensor from EVAP canister.

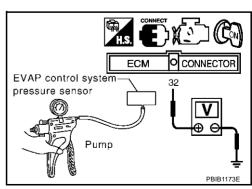
Do not reuse the O-ring, replace it with a new one.

- 3. Install a vacuum pump to EVAP control system pressure sensor.
- Turn ignition switch ON and check output voltage between ECM terminal 32 and ground under the following conditions.

Applied vacuum kPa (mmHg, inHg)	Voltage V	
Not applied	1.8 - 4.8	
-26.7 (-200, -7.87)	2.1 to 2.5V lower than above value	

CAUTION:

- Always calibrate the vacuum pump gauge when using it.
- Do not apply below -93.3 kPa (-700 mmHg, -27.56 inHg) or pressure over 101.3 kPa (760 mmHg, 29.92 inHg).
- If NG, replace EVAP control system pressure sensor.



[TYPE 2]

DTC P0453 EVAP CONTROL SYSTEM PRESSURE SENSOR

PFP:25085

Component Description

ARS0087M

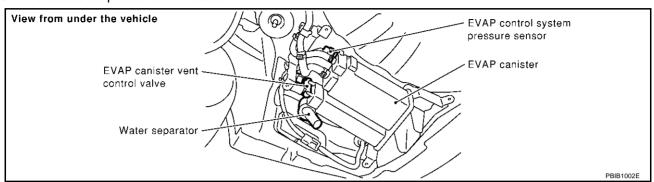
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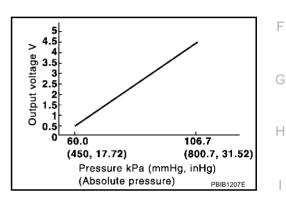
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The EVAP control system pressure sensor detects pressure in the purge line. The sensor output voltage to the ECM increases as pressure increases.





CONSULT-II Reference Value in Data Monitor Mode

ABS0087N

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
EVAP SYS PRES	Ignition switch: ON	Approx. 1.8 - 4.8V

On Board Diagnosis Logic

ABS00870

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NOTE:

If DTC P0453 is displayed with DTC P1229, first perform the trouble diagnosis for DTC P1229. Refer to $\overline{\text{EC-1151}}$.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0453 0453	EVAP control system pressure sensor high input	An excessively high voltage from the sensor is sent to ECM.	 Harness or connectors (The sensor circuit is open or shorted.) EVAP control system pressure sensor EVAP canister vent control valve EVAP canister Water separator Rubber hose from EVAP canister vent control valve to water separator

[TYPE 2]

DTC Confirmation Procedure

ABS0087P

NOTE:

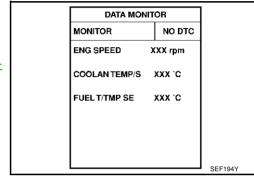
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Always perform test at a temperature of 5°C (41°F) or more.

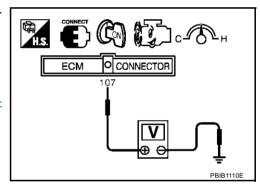
(II) WITH CONSULT-II

- 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. Select "DATA MONITOR" mode with CONSULT-II.
- 5. Make sure that "FUEL T/TEMP SE" is more than 0°C (32°F).
- 6. Start engine and wait at least 20 seconds.
- 7. If 1st trip DTC is detected, go to <u>EC-1010, "Diagnostic Procedure"</u>.

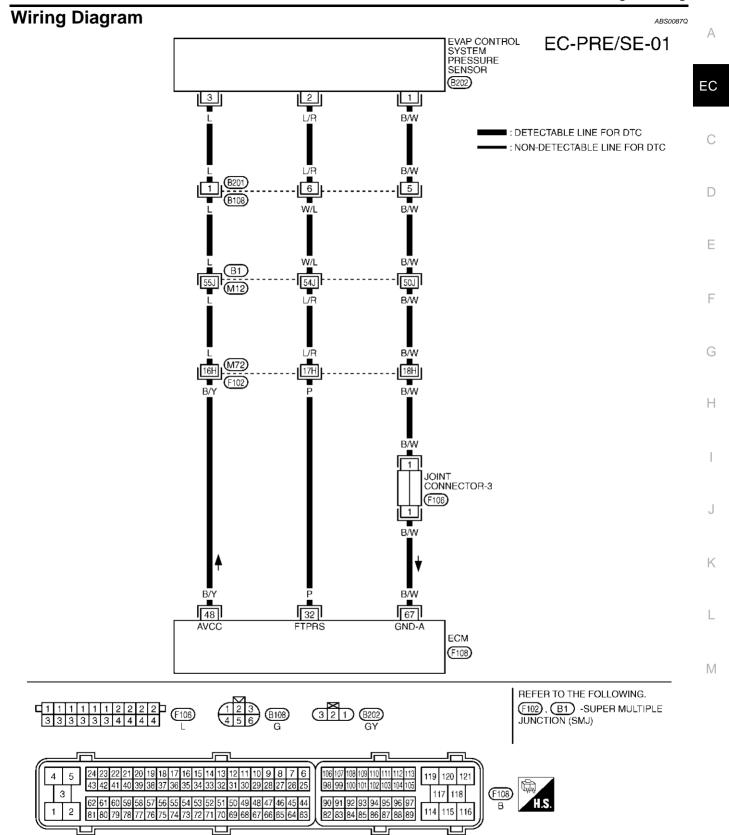


WITH GST

- 1. Start engine and warm it up to normal operating temperature.
- 2. Check that voltage between ECM terminal 107 (Fuel tank temperature sensor signal) and ground is less than 4.2V.
- 3. Turn ignition switch OFF and wait at least 10 seconds.
- 4. Start engine and wait at least 20 seconds.
- Select "MODE 7" with GST.
 If 1st trip DTC is detected, go to <u>EC-1010, "Diagnostic Procedure"</u>.



[TYPE 2]



TBWT0424E

[TYPE 2]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
32	Р	EVAP control system pressure sensor	[Ignition switch: ON]	Approximately 1.8 - 4.8V
48	B/Y	Sensors' power supply (EVAP control system pressure sensor)	[Ignition switch: ON]	Approximately 5V
67	B/W	Sensors' ground (Mass air flow sensor / IAT sensor / Power steering pressure sensor / EVAP control system pressure sensor)	[Engine is running] • Warm-up condition • Idle speed	Approximately 0V

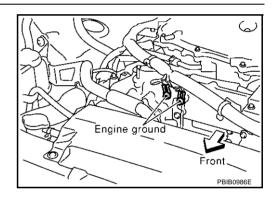
Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

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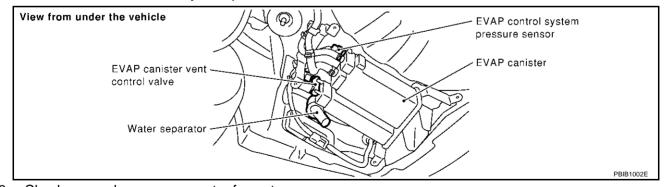
Loosen and retighten engine ground screws.

>> GO TO 2.



2. CHECK CONNECTOR

1. Disconnect EVAP control system pressure sensor harness connector.



Check sensor harness connector for water.

Water should not exist.

OK or NG

OK >> GO TO 3.

NG >> Repair or replace harness connector.

[TYPE 2]

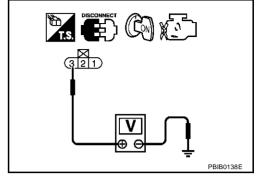
3. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT

- 1. Turn ignition switch ON.
- 2. Check voltage between EVAP control system pressure sensor terminal 3 and ground with CONSULT-II or tester.

Voltage: Approximately 5V

OK or NG

OK >> GO TO 5. NG >> GO TO 4.



4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B201, B108
- Harness connectors B1, M12
- Harness connectors M72, F102
- Harness for open or short between EVAP control system pressure sensor and ECM

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

5. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check harness continuity between EVAP control system pressure sensor terminal 1 and ECM terminal 67.

Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 7. NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B201, B108
- Harness connectors B1, M12
- Harness connectors M72, F102
- Joint connector-3
- Harness for open or short between EVAP control system pressure sensor and ECM
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

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[TYPE 2]

7. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

 Check harness continuity between ECM terminal 32 and EVAP control system pressure sensor terminal 2.

Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 9. NG >> GO TO 8.

8. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B201, B108
- Harness connectors B1, M12
- Harness connectors M72, F102
- Harness for open or short between EVAP control system pressure sensor and ECM
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

9. CHECK RUBBER TUBE FOR CLOGGING

- 1. Disconnect rubber tube connected to EVAP canister vent control valve.
- 2. Check the rubber tube for clogging.

OK or NG

OK >> GO TO 10.

NG >> Clean the rubber tube using an air blower.

10. CHECK EVAP CANISTER VENT CONTROL VALVE

Refer to EC-996, "Component Inspection".

OK or NG

OK >> GO TO 11.

NG >> Replace EVAP canister vent control valve.

11. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-1014, "Component Inspection" .

OK or NG

OK >> GO TO 12.

NG >> Replace EVAP control system pressure sensor.

12. CHECK RUBBER TUBE

Check obstructed rubber tube connected to EVAP canister vent control valve.

OK or NG

OK >> GO TO 13.

NG >> Clean rubber tube using an air blower, repair or replace rubber tube.

[TYPE 2]

$\overline{13}$. Check water separator

Refer to EC-1032, "Component Inspection".

OK or NG

OK >> GO TO 14.

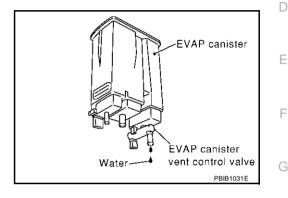
NG >> Replace water separator.

14. CHECK IF EVAP CANISTER SATURATED WITH WATER

- Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
- Check if water will drain from the EVAP canister.

Yes or No

Yes >> GO TO 15. Nο >> GO TO 17.



15. 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).

OK or NG

>> GO TO 17. OK NG >> GO TO 16.

16. DETECT MALFUNCTIONING PART

Check the following.

- EVAP canister for damage
- EVAP hose between EVAP canister and water separator for clogging or poor connection
 - >> Repair hose or replace EVAP canister.

17. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

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[TYPE 2]

Component Inspection EVAP CONTROL SYSTEM PRESSURE SENSOR

ABS0087S

- 1. Remove EVAP control system pressure sensor with its harness connector connected.
- 2. Remove EVAP control system pressure sensor from EVAP canister. **Do not reuse the O-ring, replace it 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 terminal 32 and ground under the following conditions.

Applied vacuum kPa (mmHg, inHg)	Voltage V	
Not applied	1.8 - 4.8	
-26.7 (-200, -7.87)	2.1 to 2.5V lower than above value	

EVAP control system pressure sensor Pump

CAUTION:

- Always calibrate the vacuum pump gauge when using it.
- Do not apply below -93.3 kPa (-700 mmHg, -27.56 inHg) or pressure over 101.3 kPa (760 mmHg, 29.92 inHg).
- 5. If NG, replace EVAP control system pressure sensor.

DTC P0455 EVAP CONTROL SYSTEM

On Board Diagnosis Logic

PFP:14950

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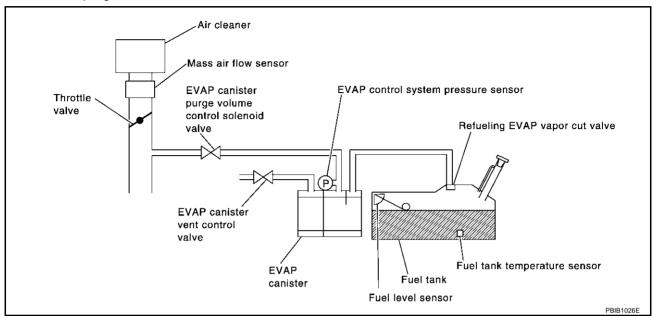
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This diagnosis detects a very large leak (fuel filler cap fell off etc.) in EVAP system between the fuel tank and EVAP canister purge volume control solenoid valve.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
			Fuel filler cap remains open or fails to 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 control system has a very large leak	EVAP purge line (pipe and rubber tube) leaks
0455 455	EVAP control system	such as fuel filler cap fell off, EVAP control sys-	EVAP purge line rubber tube bent.
400	gross leak detected	tem does not operate properly.	Blocked or bent rubber tube to EVAP control system pressure sensor
			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 come on.
- If the fuel filler cap is not tightened properly, the MIL may come on.
- Use only a genuine NISSAN rubber tube as a replacement.

DTC Confirmation Procedure

ABS0087U

CAUTION:

Never remove fuel filler cap during the DTC Confirmation Procedure.

NOTE:

- Make sure that EVAP hoses are connected to EVAP canister purge volume control solenoid valve properly.
- If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

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.

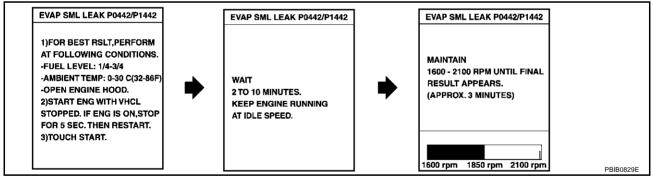
(III) WITH CONSULT-II

- 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-II.
- 5. Make sure 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 "EVAP SML LEAK P0442/P1442" of "EVAPORATIVE SYSTEM" in "DTC WORK SUPPORT" mode with CONSULT-II.

Follow the instruction displayed.

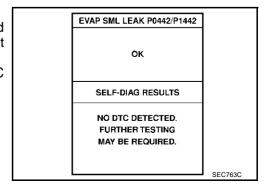


NOTE:

If the engine speed cannot be maintained within the range displayed on the CONSULT-II screen, go to <u>EC-727</u>, "Basic Inspection".

7. Make sure that "OK" is displayed. If "NG" is displayed, select "SELF-DIAG RESULTS" mode and make sure that "EVAP GROSS LEAK [P0455]" is displayed. If it is displayed, refer to <u>EC-1017</u>, "<u>Diagnostic Procedure</u>". If P0442 is displayed, perform "Diagnostic Procedure" for DTC

P0442 EC-977, "Diagnostic Procedure".



® WITH GST

NOTE:

Be sure to read the explanation of EC-707, "Driving Pattern" before driving vehicle.

- Start engine.
- Drive vehicle according to EC-707, "Driving Pattern".
- 3. Stop vehicle.
- 4. Select "MODE 1" with GST.
 - If SRT of EVAP system is not set yet, go to the following step.
 - If SRT of EVAP system is set, the result will be OK.
- Turn ignition switch OFF and wait at least 10 seconds.
- Start engine.

It is not necessary to cool engine down before driving.

- 7. Drive vehicle again according to EC-707, "Driving Pattern".
- 8. Stop vehicle.
- 9. Select "MODE 3" with GST.
 - If P0455 is displayed on the screen, go to EC-1017, "Diagnostic Procedure".
 - If P0442 is displayed on the screen, go to Diagnostic Procedure, for DTC P0442, EC-977.
 - If P0441 is displayed on the screen, go to Diagnostic Procedure for DTC P0441, EC-971.
 - If P0455, P0441, P0442 are not displayed on the screen, go to the following step.
- 10. Select "MODE 1" with GST.
 - If SRT of EVAP system is set, the result will be OK.
 - If SRT of EVAP system is not set, go to step 6.

Diagnostic Procedure

1. CHECK FUEL FILLER CAP DESIGN

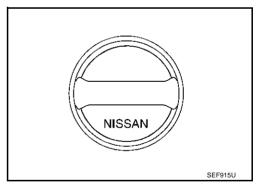
Turn ignition switch OFF.

2. Check for genuine NISSAN fuel filler cap design.

OK or NG

OK >> GO TO 2.

NG >> 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.

OK or NG

OK >> GO TO 3.

NG >> 1. Open fuel filler cap, then clean cap and fuel filler neck threads using air blower.

2. Retighten until ratcheting sound is heard.

3. CHECK FUEL FILLER CAP FUNCTION

Check for air releasing sound while opening the fuel filler cap.

OK or NG

>> GO TO 5.

>> GO TO 4. NG

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EC-1017

4. CHECK FUEL TANK VACUUM RELIEF VALVE

Refer to EC-1295, "FUEL TANK VACUUM RELIEF VALVE (BUILT INTO FUEL FULLER CAP)".

OK or NG

OK >> GO TO 5.

NG >> 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-1293, "EVAPORATIVE EMISSION LINE DRAWING".

OK or NG

OK >> GO TO 6.

NG >> 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-1296</u>, "Removal and Installation".
- EVAP canister vent control valve.
 Refer to EC-996, "Component Inspection".

OK or NG

OK >> GO TO 8.

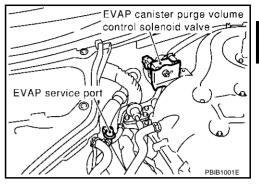
NG >> Repair or replace EVAP canister vent control valve and O-ring.

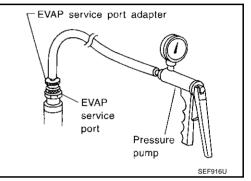
8. INSTALL THE PRESSURE PUMP

To locate the EVAP leak, install EVAP service port adapter and pressure pump to EVAP service port securely.

NOTE:

Improper installation of the EVAP service port adapter to the EVAP service port may cause leaking.





Models with CONSULT-II>>GO TO 9. Models without CONSULT-II>>GO TO 10.

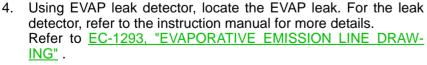
9. CHECK FOR EVAP LEAK

(P) With CONSULT-II

- 1. Turn ignition switch ON.
- 2. Select "EVAP SYSTEM CLOSE" of "WORK SUPPORT" mode with CONSULT-II.
- 3. Touch "START" and apply pressure into the EVAP line until the pressure indicator reaches the middle of the bar graph.

NOTE:

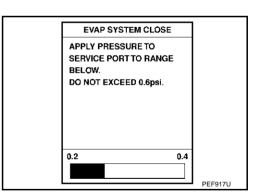
- Never use compressed air or a high pressure pump.
- Do not exceed 4.12 kPa (0.042 kg/cm², 0.6 psi) of pressure in the system.

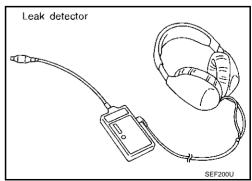


OK or NG

OK >> GO TO 11.

NG >> Repair or replace.





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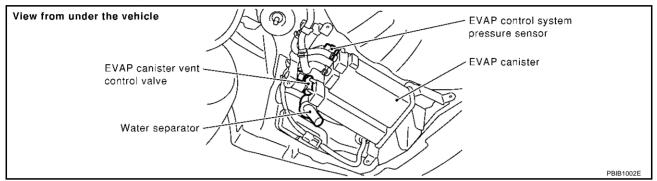
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10. CHECK FOR EVAP LEAK

(R) Without CONSULT-II

- Turn ignition switch OFF.
- 2. Apply 12 volts DC to EVAP canister vent control valve. The valve will close. (Continue to apply 12 volts until the end of test.)



3. Pressurize the EVAP line using pressure pump with 1.3 to 2.7 kPa (10 to 20 mmHg, 0.39 to 0.79 inHg), then remove pump and EVAP service port adapter.

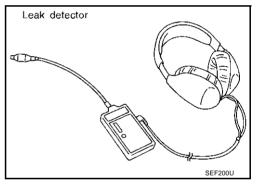
NOTE:

- Never use compressed air or a high pressure pump.
- Do not exceed 4.12 kPa (0.042 kg/cm², 0.6 psi) of pressure in the system.
- 4. Using EVAP leak detector, locate the EVAP leak. For the leak detector, refer to the instruction manual for more details. Refer to EC-1293, "EVAPORATIVE EMISSION LINE DRAWING".

OK or NG

OK >> GO TO 12.

NG >> Repair or replace.



11. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

(P) With CONSULT-II

- 1. Disconnect vacuum hose to EVAP canister purge volume control solenoid valve at EVAP service port.
- 2. Start engine.
- 3. Perform "PURG VOL CONT/V" in "ACTIVE TEST" mode.
- Touch "Qu" on CONSULT-II screen to increase "PURG VOL CONT/V" opening to 100%.
- 5. Check vacuum hose for vacuum when revving engine up to 2,000 rpm.

OK or NG

OK >> GO TO 14.

NG >> GO TO 13.

	_	I
ACTIVE TES	Г	
PURG VOL CONT/V	XXX %	
MONITOR		
ENG SPEED	XXX rpm	
A/F ALPHA-B1	XX %	
HO2S1 MNTR (B1)	LEAN	
		PBIB082

DTC P0455 EVAP CONTROL SYSTEM

[TYPE 2]

12. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

(R) Without CONSULT-II

- Start engine and warm it up to normal operating temperature.
- 2. Stop engine.
- Disconnect vacuum hose to EVAP canister purge volume control solenoid valve at EVAP service port.
- 4. Start engine and let it idle for at least 80 seconds.
- Check vacuum hose for vacuum when revving engine up to 2,000 rpm.

Vacuum should exist.

OK or NG

OK >> GO TO 15. NG >> GO TO 13.

13. CHECK VACUUM HOSE

Check vacuum hoses for clogging or disconnection. Refer to EC-670, "Vacuum Hose Drawing".

OK or NG

OK (With CONSULT-II)>>GO TO 14.

OK (Without CONSULT-II)>>GO TO 15.

>> Repair or reconnect the hose.

14. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

(P) With CONSULT-II

- 1. Start engine.
- 2. Perform "PURG VOL CONT/V" in "ACTIVE TEST" mode with CONSULT-II. Check that engine speed varies according to the valve opening.

OK or NG

OK >> GO TO 16. NG >> GO TO 15.

ACTIVE TES	ST .
PURG VOL CONT/V	XXX %
MONITOR	
ENG SPEED	XXX rpm
A/F ALPHA-B1	XX %
HO2S1 MNTR (B1)	LEAN

15. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-989, "Component Inspection".

OK or NG

OK >> GO TO 16.

NG >> Replace EVAP canister purge volume control solenoid valve.

16. CHECK FUEL TANK TEMPERATURE SENSOR

Refer to EC-926, "Component Inspection".

OK or NG

OK >> GO TO 17.

NG >> Replace fuel level sensor unit.

EC-1021 Revision; 2004 April 2003 G35 Sedan

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17. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-1006, "Component Inspection".

OK or NG

OK >> GO TO 18.

NG >> Replace EVAP control system pressure sensor.

18. CHECK EVAP/ORVR LINE

Check EVAP/ORVR line between EVAP canister and fuel tank for clogging, kink, looseness and improper connection. For location, refer to $\underline{\text{EC-1299}}$, "ON BOARD REFUELING VAPOR RECOVERY (ORVR)".

OK or NG

OK >> GO TO 19.

NG >> Repair or replace hoses and tubes.

19. CHECK RECIRCULATION LINE

Check recirculation line between filler neck tube and fuel tank for clogging, kink, cracks, looseness and improper connection.

OK or NG

OK >> GO TO 20.

NG >> Repair or replace hose, tube or filler neck tube.

20. CHECK REFUELING EVAP VAPOR CUT VALVE

Refer to EC-1303, "REFUELING EVAP VAPOR CUT VALVE".

OK or NG

OK >> GO TO 21.

NG >> Replace refueling EVAP vapor cut valve with fuel tank.

21. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

DTC P0456 EVAP CONTROL SYSTEM

PFP:14950

On Board Diagnosis Logic

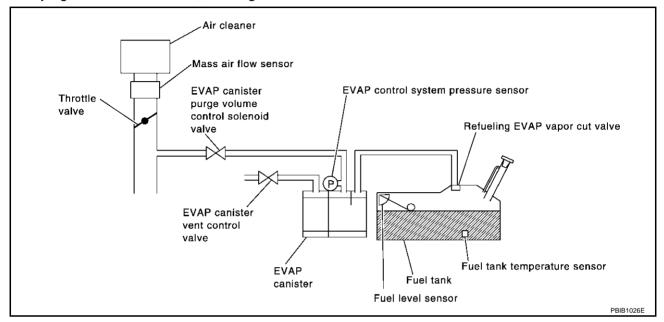
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This diagnosis detects very small leaks in the EVAP line between fuel tank and EVAP canister purge volume control solenoid valve, using the intake manifold vacuum in the same way as conventional EVAP small leak diagnosis.

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 there are no leaks, the diagnosis will be OK.



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DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
			Incorrect fuel tank vacuum relief valve
			Incorrect fuel filler cap used
			Fuel filler cap remains open or fails to 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
	Evaporative emission		Blocked or bent rubber tube to EVAP control system pressure sensor
P0456	control system very	EVAP system has a very small leak.	Loose or disconnected rubber tube
0456	small leak (negative	 EVAP system does not operate prop- erly. 	EVAP canister vent control valve and the circuit
	pressure check)	City.	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
			Water separator
			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 vol- ume 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 come on.
- If the fuel filler cap is not tightened properly, the MIL may come on.
- Use only a genuine NISSAN rubber tube as a replacement.

DTC Confirmation Procedure

ABS0087X

NOTE:

- If DTC P0456 is displayed with P0442, first perform trouble diagnosis for DTC P0456.
- After repair, make sure that the hoses and clips are installed properly.
- If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

- Open engine hood before conducting 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.
- Refilled or drained the fuel.
- EVAP component parts is/are removed.
- Before performing the following procedure, confirm that battery voltage is more than 11V at idle.

(A) WITH CONSULT-II

- Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-II.
- Make sure the following conditions are met.

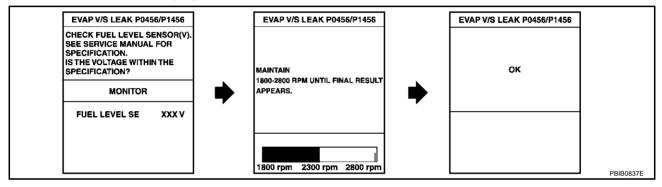
FUEL LEVEL SE: 0.25 - 1.4V

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 refilling/draining 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 "EVAP V/S LEAK P0456/P1456" of "EVAPORATIVE SYSTEM" in "DTC WORK SUPPORT" mode with CONSULT-II.

Follow the instruction displayed.



Make sure that "OK" is displayed.

If "NG" is displayed, refer to EC-1026, "Diagnostic Procedure".

- If the engine speed cannot be maintained within the range displayed on CONSULT-II screen, go to EC-727, "Basic Inspection".
- Make sure that EVAP hoses are connected to EVAP canister purge volume control solenoid valve properly.

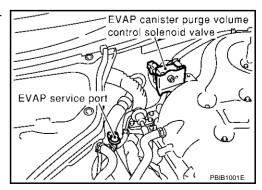
Overall Function Check

WITH GST

Use this procedure to check the overall function of the EVAP very small leak function. During this check, a DTC might not be confirmed.

CAUTION:

- Never use compressed air, doing so may damage the EVAP system.
- Do not start engine.
- Do not exceeded 4.12 kPa (0.042 kg/cm², 0.6 psi).
- Attach the EVAP service port adapter securely to the EVAP service port.



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Adapter for EVAP service port

EVAP

service port

Pressure pump

- 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 mode 8.
- 6. Using mode 8 control the EVAP canister vent control valve (close).
- Apply pressure and make sure the following conditions are satisfied

Pressure to be applied: 2.7 kPa (20 mmHg, 0.79 inHg) 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 (3 mmHg, 0.12 inHg).

If NG, go to EC-1026, "Diagnostic Procedure".

If OK, go to next step.

- 8. Disconnect GST.
- 9. Start engine and warm it up to normal operating temperature.
- 10. Turn ignition switch OFF and wait at least 10 seconds.
- 11. Restart engine and let it idle for 90 seconds.
- 12. Keep engine speed at 2,000 rpm for 30 seconds.
- 13. Turn ignition switch OFF.

NOTE:

For more information, refer to GST instruction manual.

Diagnostic Procedure

1. CHECK FUEL FILLER CAP DESIGN

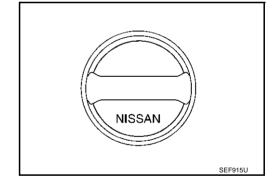
ABS0087Z

- 1. Turn ignition switch OFF.
- 2. Check for genuine NISSAN fuel filler cap design.

OK or NG

OK >> GO TO 2.

NG >> 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.

OK or NG

OK >> GO TO 3.

NG >> 1. Open fuel filler cap, then clean cap and fuel filler neck threads using air blower.

2. Retighten until ratcheting sound is heard.

3. CHECK FUEL FILLER CAP FUNCTION

Check for air releasing sound while opening the fuel filler cap.

OK or NG

OK >> GO TO 5.

NG >> GO TO 4.

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4. CHECK FUEL TANK VACUUM RELIEF VALVE

Refer to $\underline{\sf EC-1295}$, "FUEL TANK VACUUM RELIEF VALVE (BUILT INTO FUEL FULLER CAP)" .

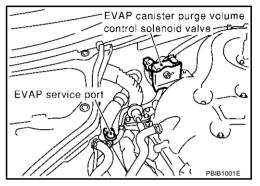
OK or NG

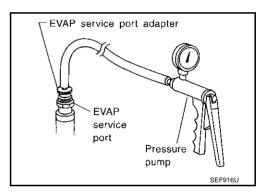
OK >> GO TO 5.

NG >> Replace fuel filler cap with a genuine one.

5. INSTALL THE PRESSURE PUMP

To locate the EVAP leak, install EVAP service port adapter and pressure pump to EVAP service port securely. For the location of EVAP service port, refer to EC-1293, "EVAPORATIVE EMISSION LINE <a href="DRAWING".





NOTE:

Improper installation of the EVAP service port adapter to the EVAP service port may cause leaking.

Models with CONSULT-II>>GO TO 6. Models without CONSULT-II>>GO TO 7.

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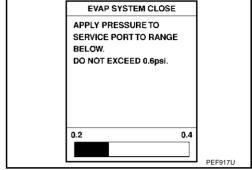
6. CHECK FOR EVAP LEAK

(P) With CONSULT-II

- 1. Turn ignition switch ON.
- 2. Select "EVAP SYSTEM CLOSE" of "WORK SUPPORT" mode with CONSULT-II.
- 3. Touch "START" and apply pressure into the EVAP line until the pressure indicator reaches the middle of the bar graph.

NOTE:

- Never use compressed air or a high pressure pump.
- Do not exceed 4.12 kPa (0.042 kg/cm², 0.6 psi) of pressure in the system.

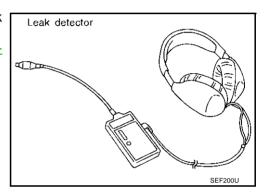


 Using EVAP leak detector, locate the EVAP leak. For the leak detector, refer to the instruction manual for more details. Refer to <u>EC-1293</u>, "EVAPORATIVE EMISSION LINE DRAW-ING".

OK or NG

OK >> GO TO 8.

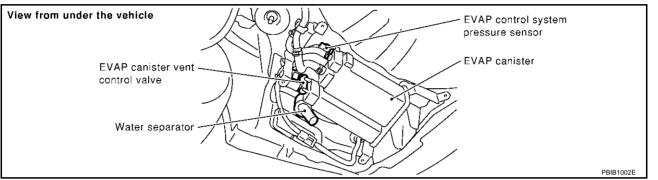
NG >> Repair or replace.



7. CHECK FOR EVAP LEAK

Without CONSULT-II

- Turn ignition switch OFF.
- 2. Apply 12 volts DC to EVAP canister vent control valve. The valve will close. (Continue to apply 12 volts until the end of test.)



3. Pressurize the EVAP line using pressure pump with 1.3 to 2.7 kPa (10 to 20 mmHg, 0.39 to 0.79 inHg), then remove pump and EVAP service port adapter.

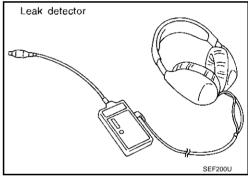
NOTE:

- Never use compressed air or a high pressure pump.
- Do not exceed 4.12 kPa (0.042 kg/cm², 0.6 psi) of pressure in the system.
- 4. Using EVAP leak detector, locate the EVAP leak. For the leak detector, refer to the instruction manual for more details. Refer to EC-1293, "EVAPORATIVE EMISSION LINE DRAWING".

OK or NG

OK >> GO TO 8.

NG >> Repair or replace.



8. CHECK WATER SEPARATOR

Refer to EC-1032, "Component Inspection".

OK or NG

OK >> GO TO 9.

NG >> Replace water separator.

9. CHECK EVAP CANISTER VENT CONTROL VALVE

Check the following.

- EVAP canister vent control valve is installed properly. Refer to <u>EC-1296</u>, "Removal and Installation".
- EVAP canister vent control valve.
 Refer to <u>EC-996</u>, "Component Inspection".

OK or NG

OK >> GO TO 10.

NG >> Repair or replace EVAP canister vent control valve and O-ring.

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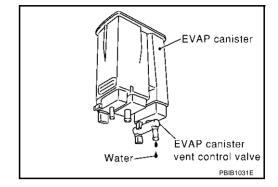
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10. CHECK IF EVAP CANISTER SATURATED WITH WATER

- Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
- 2. Does water drain from the EVAP canister?

Yes or No

Yes >> GO TO 11. No (With CONSULT-II)>>GO TO 13. No (Without CONSULT-II)>>GO TO 14.



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).

OK or NG

OK (With CONSULT-II)>>GO TO 13. OK (Without CONSULT-II)>>GO TO 14. NG >> GO TO 12.

12. DETECT MALFUNCTIONING PART

Check the following.

- EVAP canister for damage
- EVAP hose between EVAP canister and water separator for clogging or poor connection

>> Repair hose or replace EVAP canister.

13. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

(P) With CONSULT-II

- 1. Disconnect vacuum hose to EVAP canister purge volume control solenoid valve at EVAP service port.
- 2. Start engine.
- 3. Perform "PURG VOL CONT/V" in "ACTIVE TEST" mode.
- 4. Touch "Qu" on CONSULT-II screen to increase "PURG VOL CONT/V" opening to 100%.
- 5. Check vacuum hose for vacuum when revving engine up to 2,000 rpm.

OK or NG

OK >> GO TO 16. NG >> GO TO 15.

ACTIVE TES	ST	
PURG VOL CONT/V	0 %	
MONITOR		
ENG SPEED	XXX rpm	
HO2S1 MNTR (B1)	LEAN	
HO2S1 MNTR (B2)	LEAN	
A/F ALPHA-B1	XXX %	
A/F ALPHA-B2	XXX %	
	•	PBIB0147E

14. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

(R) Without CONSULT-II

- Start engine and warm it up to normal operating temperature.
- 2. Stop engine.
- Disconnect vacuum hose to EVAP canister purge volume control solenoid valve at EVAP service port.
- Start engine and let it idle for at least 80 seconds.
- Check vacuum hose for vacuum when revving engine up to 2,000 rpm.

Vacuum should exist.

OK or NG

OK >> GO TO 16. NG >> GO TO 15.

15. CHECK VACUUM HOSE

Check vacuum hoses for clogging or disconnection. Refer to EC-670, "Vacuum Hose Drawing".

OK or NG

>> GO TO 16. OK

NG >> Repair or reconnect the hose.

16. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-989. "Component Inspection".

OK or NG

OK >> GO TO 17.

NG >> Replace EVAP canister purge volume control solenoid valve.

17. CHECK FUEL TANK TEMPERATURE SENSOR

Refer to EC-926, "Component Inspection".

OK or NG

OK >> GO TO 18.

NG >> Replace fuel level sensor unit.

18. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-1006, "Component Inspection".

OK or NG

OK >> GO TO 19.

NG >> Replace EVAP control system pressure sensor.

19. check evap purge line

Check EVAP purge line (pipe, rubber tube, fuel tank and EVAP canister) for cracks or improper connection. Refer to EC-1293, "EVAPORATIVE EMISSION LINE DRAWING".

OK or NG

OK >> GO TO 20.

NG >> Repair or reconnect the hose.

20. CLEAN EVAP PURGE LINE

Clean EVAP purge line (pipe and rubber tube) using air blower.

>> GO TO 21.

EC-1031 Revision; 2004 April 2003 G35 Sedan

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21. CHECK EVAP/ORVR LINE

Check EVAP/ORVR line between EVAP canister and fuel tank for clogging, kink, looseness and improper connection. For location, refer to <u>EC-1299</u>, "ON BOARD REFUELING VAPOR RECOVERY (ORVR)".

OK or NG

OK >> GO TO 22.

NG >> Repair or replace hoses and tubes.

22. CHECK RECIRCULATION LINE

Check recirculation line between filler neck tube and fuel tank for clogging, kink, cracks, looseness and improper connection.

OK or NG

OK >> GO TO 23.

NG >> Repair or replace hose, tube or filler neck tube.

23. CHECK REFUELING EVAP VAPOR CUT VALVE

Refer to EC-1302, "Component Inspection".

OK or NG

OK >> GO TO 24.

NG >> Replace refueling EVAP vapor cut valve with fuel tank.

24. CHECK FUEL LEVEL SENSOR

Refer to DI-21, "FUEL LEVEL SENSOR UNIT CHECK".

OK or NG

OK >> GO TO 25.

NG >> Replace fuel level sensor unit.

25. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

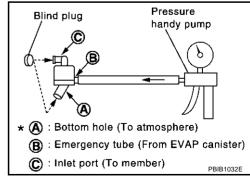
Component Inspection WATER SEPARATOR

ABS008GF

- 1. Check visually for insect nests in the water separator air inlet.
- 2. Check visually for cracks or flaws in the appearance.
- 3. Check visually for cracks or flaws in the hose.
- 4. Check that **A** and **C** are not clogged by blowing air into **B** with **A**, and then **C** plugged.
- 5. In case of NG in items 2 4, replace the parts.

NOTE:

Do not disassemble water separator.



DTC P0460 FUEL LEVEL SENSOR

PFP:25060

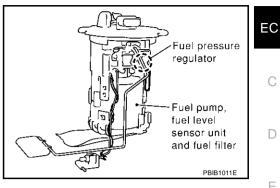
Component Description

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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 combination meter. The combination meter 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.



On Board Diagnosis Logic

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NOTE:

If DTC P0460 is displayed with DTC U1000 or U1001, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-788.

When the vehicle is parked, naturally the fuel level in the fuel tank is 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 0460	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)
			Combination meter
			Fuel level sensor

DTC Confirmation Procedure

ABS00882

NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

(P) WITH CONSULT-II

- 1. Turn ignition switch ON.
- Select "DATA MONITOR" mode with CONSULT-II.
- Start engine and wait maximum of 2 consecutive minutes.
- 4. If 1st trip DTC is detected, go to EC-1034, "Diagnostic Procedure".

DATA M	ONITOR
MONITOR	NO DTC
FUELT/TMP SE	XXX °C
FUEL LEVEL SE	XXX V

WITH GST

Follow the procedure "WITH CONSULT-II" above.

DTC P0460 FUEL LEVEL SENSOR

ITYPE 21

Diagnostic Procedure

1. CHECK FUEL GAUGE OPERATION

ABS00883

Refer to DI-14, "Meter/Gauges Operation and Odo/Trip Meter" .

OK or NG

OK >> GO TO 2.

NG >> Follow the instruction of DI-14, "Meter/Gauges Operation and Odo/Trip Meter".

2. CHECK FUEL LEVEL SENSOR AND CIRCUIT

Refer to DI-18, "Inspection/Fuel Level Sensor".

OK or NG

OK >> GO TO 3.

NG >> Repair or replace malfunctioning parts.

3. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

Removal and Installation FUEL LEVEL SENSOR

ABS00884

Refer to FL-5, "FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY".

DTC P0461 FUEL LEVEL SENSOR

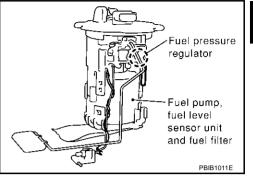
PFP:25060

Component Description

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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 combination meter. The combination meter 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.



On Board Diagnosis Logic

ABS00886

NOTE:

If DTC P0461 is displayed with DTC U1000 or U1001, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-788.

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 0461	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) Combination meter Fuel level sensor

Overall Function Check

ABS00887

Use this procedure to check the overall function of the fuel level sensor function. During this check, a 1st trip DTC might not be confirmed.

WARNING:

When performing following procedure, be sure to observe the handling of the fuel. Refer to <u>FL-12</u>. <u>"FUEL TANK"</u>.

TESTING CONDITION:

Before starting overall function check, preparation of draining fuel and refilling fuel is required.

(P) WITH CONSULT-II

NOTF:

Start from step 11, 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 EC-694, "FUEL PRESSURE RELEASE".
- 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-II.

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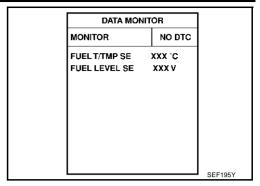
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Revision; 2004 April **EC-1035** 2003 G35 Sedan

- 7. Check "FUEL LEVEL SE" output voltage and note it.
- Select "FUEL PUMP" in "ACTIVE TEST" mode with CONSULT-II.
- 9. Touch "ON" and drain fuel approximately 30 $\,\ell$ (7-7/8 US gal, 6-5/8 Imp gal) and stop it.
- 10. Fill fuel into the fuel tank for 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal).
- 11. Check "FUEL LEVEL SE" output voltage and note it.
- 12. Check "FUEL LEVEL SE" output voltage and confirm whether the voltage changes more than 0.03V during step 7 to 11. If NG, go to <u>EC-1036</u>, "<u>Diagnostic Procedure</u>".



WITH GST

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.
- 2. Release fuel pressure from fuel line. Refer to EC-694, "FUEL PRESSURE RELEASE".
- 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.
- 10. If NG, go to EC-1036, "Diagnostic Procedure".

Diagnostic Procedure

ABS00888

1. CHECK FUEL GAUGE OPERATION

Refer to DI-14, "Meter/Gauges Operation and Odo/Trip Meter".

OK or NG

OK >> GO TO 2.

NG >> Follow the instruction of DI-14, "Meter/Gauges Operation and Odo/Trip Meter".

2. CHECK FUEL LEVEL SENSOR AND CIRCUIT

Refer to DI-18, "Inspection/Fuel Level Sensor".

OK or NG

OK >> GO TO 3.

NG >> Repair or replace malfunctioning parts.

3. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

Removal and Installation FUEL LEVEL SENSOR

ABS00889

Refer to FL-5, "FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY".

DTC P0462 FUEL LEVEL SENSOR

PFP:25060

Component Description

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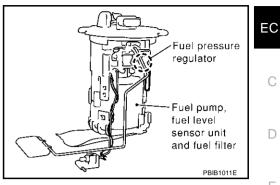
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The fuel level sensor is mounted in the fuel level sensor unit. The sensor detects a fuel level in the fuel tank and transmits a signal to the combination meter. The combination meter sends the fuel level sensor signal to the ECM through CAN communication 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.



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On Board Diagnosis Logic

NOTE:

If DTC P0462 is displayed with DTC U1000 or U1001, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-788.

This diagnosis indicates the former, to detect open or short circuit malfunction.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0462 0462	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) Harness or connectors (The sensor circuit is open or shorted) Combination meter Fuel level sensor

DTC Confirmation Procedure

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 11V at ignition switch ON.

(A) WITH CONSULT-II

- 1. Turn ignition switch ON.
- Select "DATA MONITOR" mode with CONSULT-II.
- Wait at least 5 seconds.
- 4. If 1st trip DTC is detected, go to EC-1038, "Diagnostic Procedure".

DATA MON	NITOR
MONITOR	NO DTC
FUELT/TMP SE	XXX °C
FUEL LEVEL SE	XXX V

WITH GST

Follow the procedure "WITH CONSULT-II" above.

DTC P0462 FUEL LEVEL SENSOR

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Diagnostic Procedure

1. CHECK FUEL GAUGE OPERATION

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Refer to DI-14, "Meter/Gauges Operation and Odo/Trip Meter" .

OK or NG

OK >> GO TO 2.

NG >> Follow the instruction of DI-14, "Meter/Gauges Operation and Odo/Trip Meter".

2. CHECK FUEL LEVEL SENSOR AND CIRCUIT

Refer to DI-18, "Inspection/Fuel Level Sensor".

OK or NG

OK >> GO TO 3.

NG >> Repair or replace malfunctioning parts.

3. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

Removal and Installation FUEL LEVEL SENSOR

ABS008EZ

Refer to FL-5, "FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY".

DTC P0500 VSS PFP:32702

Description

NOTE:

If DTC P0500 is displayed with DTC U1000 or U1001, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-788, "DTC U1000, U1001 CAN COMMUNICATION LINE".

The vehicle speed signal is sent to the combination meter from the VDC/TCS/ABS control unit by CAN communication line. The combination meter then sends the signal to the ECM by CAN communication line.

On Board Diagnosis Logic

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DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0500 0500	Vehicle speed sensor		Harness or connectors (The CAN communication line is open or shorted)
		The almost 0 km/h (0 MPH) signal from vehicle speed sensor is sent to ECM even when vehicle is being driven.	 Harness or connectors (The vehicle speed signal circuit is open or shorted)
			Wheel sensor
			Combination meter
			VDC/TCS/ABS control unit

DTC Confirmation Procedure

ABS008F2

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Steps 1 and 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.

(A) WITH CONSULT-II

- 1. Start engine (VDC switch OFF).
- Read "VHCL SPEED SE" in "DATA MONITOR" mode with CONSULT-II. The vehicle speed on CONSULT-II should exceed 10 km/h (6 MPH) when rotating wheels with suitable gear position. If NG, go to EC-1040, "Diagnostic Procedure".

If OK, go to following step.

- Select "DATA MONITOR" mode with CONSULT-II.
- Warm engine up to normal operating temperature.
- Maintain the following conditions for at least 60 consecutive seconds.

ENG SPEED	1,600 - 6,000 rpm
COOLAN TEMP/S	More than 70°C (158°F)
B/FUEL SCHDL	5.3 - 31.8 msec (A/T) 5.0 - 31.8 msec (M/T)
Selector lever	Except P or N position (A/T) Except Neutral position (M/T)
PW/ST SIGNAL	OFF

DATA MOR	DATA MONITOR	
MONITOR		NO DTC
ENG SPEED	X	XX rpm
COOLAN TEMP/S		xxx °C
B/FUEL SCHDL	X	XX msec
PW/ST SIGNAL		OFF
VHCL SPEED SE	X	XX km/h

If 1st trip DTC is detected, go to EC-1040, "Diagnostic Procedure".

EC-1039 Revision; 2004 April 2003 G35 Sedan

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Overall Function Check

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Use this procedure to check the overall function of the vehicle speed sensor circuit. During this check, a 1st trip DTC might not be confirmed.

WITH GST

- 1. Lift up drive wheels.
- Start engine.
- Read vehicle speed sensor signal in "MODE 1" with GST.
 The vehicle speed sensor on GST should be able to exceed 10 km/h (6 MPH) when rotating wheels with suitable gear position.
- 4. If NG, go to EC-1040, "Diagnostic Procedure".

Diagnostic Procedure

ABS008F4

1. CHECK DTC WITH VDC/TCS ABS CONTROL UNIT

Refer to BRC-13, "TROUBLE DIAGNOSIS".

OK or NG

OK >> GO TO 2.

NG >> Repair or replace.

2. COMBINATION METER

Check combination meter function.

Refer to DI-4, "COMBINATION METERS" .

>> INSPECTION END

DTC P0506 ISC SYSTEM

[TYPE 2]

DTC P0506 ISC SYSTEM

PFP:23781

Description

ABS008E5

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NOTE:

If DTC P0506 is displayed with other DTC, first perform the trouble diagnosis for the other DTC.

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 (POS) 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.).

On Board Diagnosis Logic

ABS008F6

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0506 0506	Idle speed control sys- tem 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 leak

DTC Confirmation Procedure

ABS008F7

NOTE:

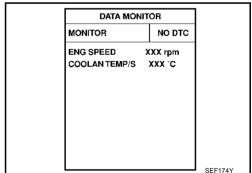
- If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
- If the target idle speed is out of the specified value, perform Idle Air Volume Learning, <u>EC-692</u>, before conducting DTC Confirmation Procedure. For the target idle speed, refer to the Service Data and Specifications (SDS), <u>EC-1310</u>.

TESTING CONDITION:

- Before performing the following procedure, confirm that battery voltage is more than 11V at idle.
- Always perform the test at a temperature above –10°C (14°F).

WITH CONSULT-II

- Open engine hood.
- 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 again and select "DATA MONITOR" mode with CONSULT-II.
- Start engine and run it for at least 1 minute at idle speed.
- 6. If 1st trip DTC is detected, go to EC-1042, "Diagnostic Procedure".



WITH GST

Follow the procedure "WITH CONSULT-II" above.

DTC P0506 ISC SYSTEM

[TYPE 2]

Diagnostic Procedure

1. CHECK INTAKE AIR LEAK

1. Start engine and let it idle.

2. Listen for an intake air leak after the mass air flow sensor.

OK or NG

OK >> GO TO 2.

NG >> Discover air leak location and repair.

2. REPLACE ECM

- 1. Stop engine.
- 2. Replace ECM.
- 3. Perform initialization of NATS system and registration of all NATS ignition key IDs. Refer to <u>BL-127, "ECM Re-communicating Function"</u>.
- 4. Perform EC-692, "Accelerator Pedal Released Position Learning".
- 5. Perform EC-692, "Throttle Valve Closed Position Learning".
- 6. Perform EC-692, "Idle Air Volume Learning".

>> INSPECTION END

DTC P0507 ISC SYSTEM

[TYPE 2]

DTC P0507 ISC SYSTEM

PFP:23781

Description

ABS008F9

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NOTE:

If DTC P0507 is displayed with other DTC, first perform the trouble diagnosis for the other DTC.

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 (POS) 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.).

On Board Diagnosis Logic

ABS008FA

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0507 0507	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

ABS008FB

NOTE:

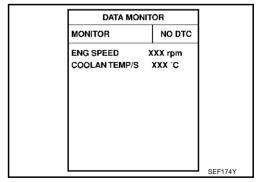
- If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
- If the target idle speed is out of the specified value, perform Idle Air Volume Learning, <u>EC-692</u>, before conducting DTC Confirmation Procedure. For the target idle speed, refer to the Service Data and Specifications (SDS), <u>EC-1310</u>.

TESTING CONDITION:

- Before performing the following procedure, confirm that battery voltage is more than 11V at idle.
- Always perform the test at a temperature above –10°C (14°F).

(P) WITH CONSULT-II

- Open engine hood.
- 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 again and select "DATA MONITOR" mode with CONSULT-II.
- 5. Start engine and run it for at least 1 minute at idle speed.
- 6. If 1st trip DTC is detected, go to EC-1044, "Diagnostic Procedure".



® WITH GST

Follow the procedure "WITH CONSULT-II" above.

DTC P0507 ISC SYSTEM

[TYPE 2]

Diagnostic Procedure

1. CHECK PCV HOSE CONNECTION

ABS008FC

Confirm that PCV hose is connected correctly.

OK or NG

OK >> GO TO 2.

NG >> Repair or replace.

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.

OK or NG

OK >> GO TO 3.

NG >> Discover air leak location and repair.

3. REPLACE ECM

- 1. Stop engine.
- 2. Replace ECM.
- 3. Perform initialization of NATS system and registration of all NATS ignition key IDs. Refer to <u>BL-127, "ECM Re-communicating Function"</u>.
- 4. Perform EC-692, "Accelerator Pedal Released Position Learning".
- 5. Perform EC-692, "Throttle Valve Closed Position Learning".
- 6. Perform EC-692, "Idle Air Volume Learning".

>> INSPECTION END

[TYPE 2]

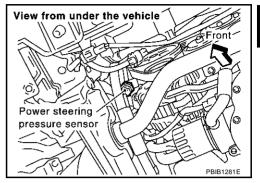
DTC P0550 PSP SENSOR

PFP:49763

Component Description

ARSONRED

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.



CONSULT-II Reference Value in Data Monitor Mode

ARSOOREE

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
PW/ST SIGNAL	Engine: After warming up, idle the engine	Steering wheel is in neutral position. (Forward direction)	OFF
	the engine	Steering wheel is turned.	ON

On Board Diagnosis Logic

ABS008FF

The MIL will not light up for this diagnosis.

NOTE:

If DTC P0550 is displayed with DTC P1229, first perform the trouble diagnosis for DTC P1229. Refer to EC-1151.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0550 0550	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

NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch "OFF" and wait at least 10 seconds before conducting the next test.

(P) WITH CONSULT-II

- 1. Turn ignition switch "ON".
- Select "DATA MONITOR" mode with CONSULT-II.
- Start engine and let it idle for at least 5 seconds.
- 4. If 1st trip DTC is detected, go to EC-1047, "Diagnostic Procedure".

WITH GST

Follow the procedure "WITH CONSULT-II" above.

EC-1045 Revision; 2004 April 2003 G35 Sedan

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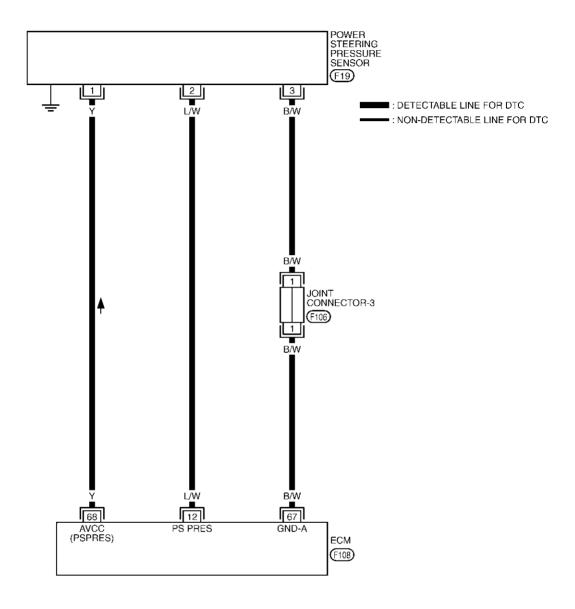
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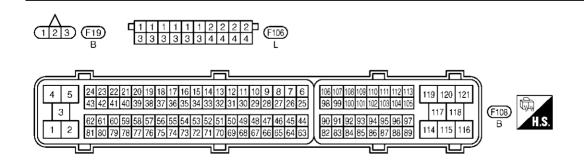
ABS008FG

Wiring Diagram

ABS008FH

EC-PS/SEN-01





TBWT0285E

DTC P0550 PSP SENSOR

[TYPE 2]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

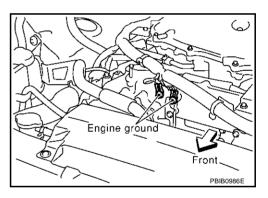
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
12	Power steering pre	Power steering pressure	[Engine is running] • Steering wheel is being turned.	0.5 - 4.5V
12 L/W	sensor	[Engine is running]Steering wheel is not being turned.	0.4 - 0.8V	
67	B/W	Sensors' ground (Mass air flow sensor / IAT sensor / Power steering pressure sensor)	[Engine is running] • Warm-up condition • Idle speed	Approximately 0V
68	Y	Sensors' power supply (Power steering pressure sensor / EVAP control sys- tem pressure sensor)	[Ignition switch ON]	Approximately 5V

Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

- 1. Turn ignition switch OFF.
- 2. Loosen and retighten engine ground screws.

>> GO TO 2.



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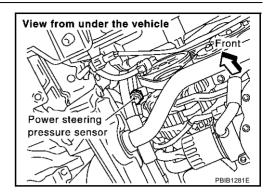
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$\overline{2}$. CHECK PSP SENSOR POWER SUPPLY CIRCUIT

- 1. Disconnect PSP sensor harness connector.
- 2. Turn ignition switch ON.



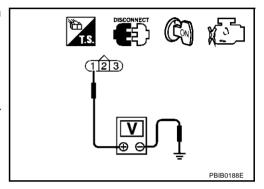
Check voltage between PSP sensor terminal 1 and ground with CONSULT-II or tester.

Voltage: Approximately 5V

OK or NG

OK >> GO TO 3.

NG >> Repair open circuit or 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.
- Check harness continuity between PSP sensor terminal 3 and ECM terminal 67. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 5. NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-3
- Harness for open or short between power steering pressure sensor and ECM
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK PSP SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

Check harness continuity between ECM terminal 12 and PSP sensor terminal 2.

Continuity should exist.

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

OK or NG

OK >> GO TO 6.

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

DTC P0550 PSP SENSOR

[TYPE 2]

6. CHECK PSP SENSOR

Refer to EC-1049, "Component Inspection".

OK or NG

OK >> GO TO 7.

NG >> Replace PSP sensor.

7. CHECK INTERMITTENT INCIDENT

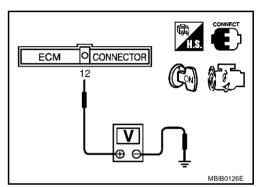
Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

Component Inspection POWER STEERING PRESSURE SENSOR

- 1. Reconnect all harness connectors disconnected.
- 2. Start engine and let it idle.
- 3. Check voltage between ECM terminal 12 and ground under the following conditions.

Condition	Voltage
Steering wheel is being turned.	0.5 - 4.5V
Steering wheel is not being turned.	0.4 - 0.8V



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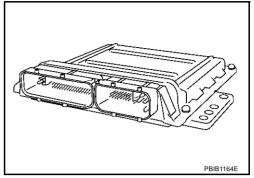
[TYPE 2]

DTC P0605 ECM PFP:23710

Component Description

ABSOOREK

The ECM consists of a microcomputer and connectors for signal input and output and for power supply. The ECM controls the engine.



On Board Diagnosis Logic

ABS008FL

This self-diagnosis has one or two trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition		Possible cause
P0605 0605	Engine control module	A)	ECM calculation function is malfunctioning.	• ECM
		B)	ECM EEP-ROM system is malfunctioning.	
		C)	ECM self shut-off function is malfunctioning.	

FAIL-SAFE MODE

ECM enters fail-safe mode when the malfunction A is detected.

Detected items	Engine operation condition in fail-safe mode	
Malfunction A	 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. 	

DTC Confirmation Procedure

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Perform PROCEDURE FOR MALFUNCTION A first. If the 1st trip DTC cannot be confirmed, perform PROCEDURE FOR MALFUNCTION B. If there is no malfunction on PROCEDURE FOR MALFUNCTION B, perform PROCEDURE FOR MALFUNCTION C.

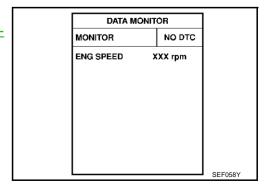
NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

PROCEDURE FOR MALFUNCTION A

(P) With CONSULT-II

- 1. Turn ignition switch ON.
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- If 1st trip DTC is detected, go to <u>EC-1051</u>, "<u>Diagnostic Procedure</u>".



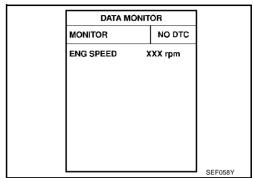
⊕ With GST

Follow the procedure "With CONSULT-II" above.

PROCEDURE FOR MALFUNCTION B

With CONSULT-II

- Turn ignition switch ON and wait at least 1 second.
- Select "DATA MONITOR" mode with CONSULT-II.
- Turn ignition switch OFF, wait at least 10 seconds, and then turn ON.
- 4. If 1st trip DTC is detected, go to EC-1051, "Diagnostic Proce-



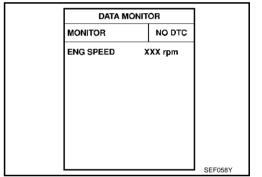
With GST

Follow the procedure "With CONSULT-II" above.

PROCEDURE FOR MALFUNCTION C

(P) With CONSULT-II

- 1. Turn ignition switch ON and wait at least 1 second.
- Select "DATA MONITOR" mode with CONSULT-II.
- 3. Turn ignition switch OFF, wait at least 10 seconds, and then turn ON.
- 4. Repeat step 3 for 32 times.
- 5. If 1st trip DTC is detected, go to EC-1051, "Diagnostic Procedure".



With GST

Follow the procedure "With CONSULT-II" above.

Diagnostic Procedure

1. INSPECTION START

(P) With CONSULT-II

- Turn ignition switch ON.
- Select "SELF DIAG RESULTS" mode with CONSULT-II.
- Touch "ERASE". 3.
- 4. Perform DTC Confirmation Procedure.

See EC-1050.

5. Is the 1st trip DTC P0605 displayed again?

With GST

- 1. Turn ignition switch ON.
- Select "MODE 4" with GST.
- 3. Touch "ERASE".
- **Perform DTC Confirmation Procedure.**

See <u>EC-1050</u>.

5. Is the 1st trip DTC P0605 displayed again?

Yes or No

Yes >> GO TO 2.

No >> INSPECTION END

EC-1051 Revision; 2004 April 2003 G35 Sedan

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2. REPLACE ECM

- 1. Replace ECM.
- 2. Perform initialization of NATS system and registration of all NATS ignition key IDs. Refer to <u>BL-127, "ECM Re-communicating Function"</u>.
- 3. Perform EC-692, "Accelerator Pedal Released Position Learning".
- 4. Perform EC-692, "Throttle Valve Closed Position Learning".
- 5. Perform EC-692, "Idle Air Volume Learning".

>> INSPECTION END

DTC P1065 ECM POWER SUPPLY

[TYPE 2]

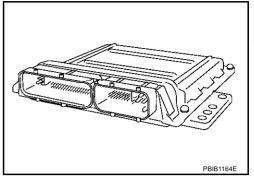
DTC P1065 ECM POWER SUPPLY

Component Description

PFP:23710

ABSOOREO

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.



On Board Diagnosis Logic

ARSONRER

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1065 1065	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

NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

(A) WITH CONSULT-II

- 1. Turn ignition switch ON and wait at least 1 second.
- Select "DATA MONITOR" mode with CONSULT-II.
- 3. Start engine and let it idle for 1 second.
- 4. Turn ignition switch OFF, wait at least 10 seconds, and then turn
- Repeat steps 3 and 4 four times.
- 6. If 1st trip DTC is detected, go to EC-1055, "Diagnostic Procedure".

DATA M	ONITOR	
MONITOR	NO DTC	
ENG SPEED	XXX rpm	1
		SEF058Y

WITH GST

Follow the procedure "WITH CONSULT-II" above.

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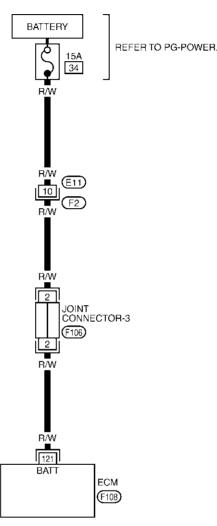
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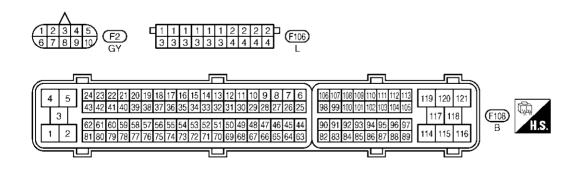
Wiring Diagram

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EC-ECM/PW-01







TBWT0286E

DTC P1065 ECM POWER SUPPLY

[TYPE 2]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
121	R/W	Power supply for ECM (Back-up)	[Ignition switch: OFF]	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

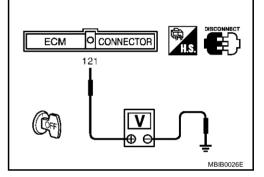
1. CHECK ECM POWER SUPPLY

- Turn ignition switch OFF. 1.
- Disconnect ECM harness connector.
- Check voltage between ECM terminal 121 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 3. NG >> GO TO 2.



2. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E11, F2
- Joint connector-3
- 15A fuse
- Harness for open or short between ECM and battery
 - >> Repair or replace harness or connectors.

3. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

OK or NG

OK >> GO TO 4.

NG >> Repair or replace harness or connectors. EC

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4. PERFORM DTC CONFIRMATION PROCEDURE

(II) With CONSULT-II

- 1. Turn ignition switch ON.
- 2. Select "SELF DIAG RESULTS" mode with CONSULT-II.
- Touch "ERASE".
- 4. Perform DTC Confirmation Procedure.

See EC-1053.

5. Is the 1st trip DTC P1065 displayed again?

With GST

- 1. Turn ignition switch ON.
- 2. Select "MODE 4" with GST.
- 3. Touch "ERASE".
- 4. Perform DTC Confirmation Procedure.

See EC-1053.

5. Is the 1st trip DTC P1065 displayed again?

Yes or No

Yes >> GO TO 5.

No >> INSPECTION END

5. REPLACE ECM

- 1. Replace ECM.
- 2. Perform initialization of NATS system and registration of all NATS ignition key IDs. Refer to <u>BL-127, "ECM Re-communicating Function"</u>.
- 3. Perform EC-692, "Accelerator Pedal Released Position Learning".
- 4. Perform EC-692, "Throttle Valve Closed Position Learning".
- 5. Perform EC-692, "Idle Air Volume Learning".

>> INSPECTION END

[TYPE 2]

DTC P1111, P1136 IVT CONTROL SOLENOID VALVE

PFP:23796

Component Description

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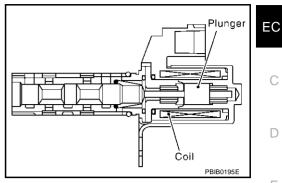
Intake valve timing control solenoid valve is activated by ON/OFF pulse duty (ratio) signals from the ECM.

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.



CONSULT-II Reference Value in Data Monitor Mode

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Specification data are reference values.

MONITOR ITEM	CON	SPECIFICATION	
	Engine: After warming up	Idle	0% - 2%
INT/V SOL (B1) INT/V SOL (B2)	Shift lever: N (A/T), Neutral (M/T)Air conditioner switch: OFFNo-load	When revving engine up to 2,000 rpm quickly	Approx. 0% - 50%

On Board Diagnosis Logic

ABS0088C

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1111 1111 (Bank 1) P1136 1136 (Bank 2)	Intake valve timing control solenoid valve circuit	An improper voltage is sent to the ECM through intake valve timing control solenoid valve.	Harness or connectors (Intake valve timing control solenoid valve circuit is open or shorted.) Intake valve timing control solenoid valve

DTC Confirmation Procedure

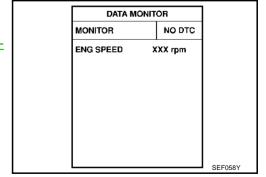
ABS0088D

NOTE

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

(A) WITH CONSULT-II

- 1. Turn ignition switch ON.
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- 3. Start engine and let it idle for 5 seconds.
- 4. If 1st trip DTC is detected, go to EC-1061, "Diagnostic Procedure".



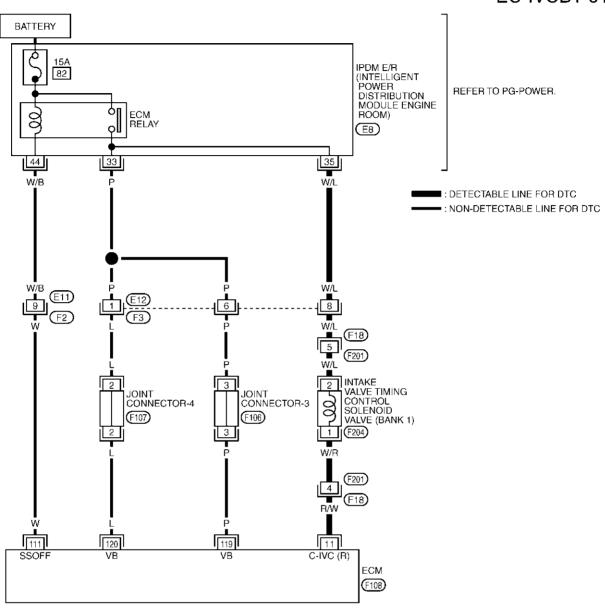
WITH GST

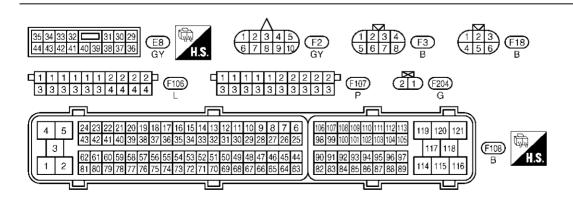
Following the procedure "WITH CONSULT-II" above.

Revision; 2004 April **EC-1057** 2003 G35 Sedan

Wiring Diagram
BANK 1

EC-IVCB1-01





TBWT0411E

DTC P1111, P1136 IVT CONTROL SOLENOID VALVE

[TYPE 2]

Specification data are reference values and are measured between each terminal and ground. Pulse signal is measured by CONSULT-II.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
		[Engine is running]Warm-up conditionIdle speed	BATTERY VOLTAGE (11 - 14V)	
11	R/W	Intake valve timing control solenoid valve (bank 1)	 [Engine is running] Warm-up condition When revving engine up to 2,500 rpm quickly 	7 - 12V*
				PBIB1790E

^{★:} Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

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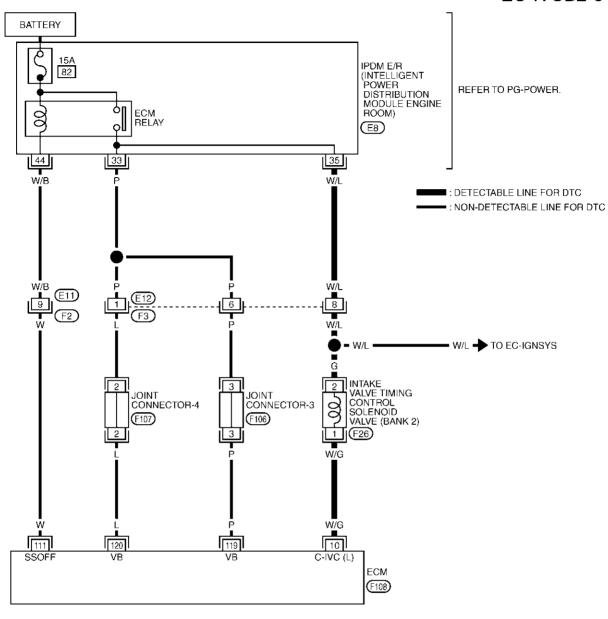
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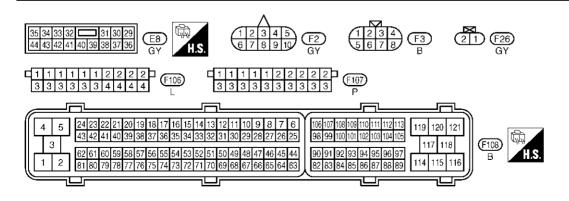
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BANK 2

EC-IVCB2-01





TBWT0412E

DTC P1111, P1136 IVT CONTROL SOLENOID VALVE

[TYPE 2]

Specification data are reference values and are measured between each terminal and ground. Pulse signal is measured by CONSULT-II.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
			[Engine is running]Warm-up conditionIdle speed	BATTERY VOLTAGE (11 - 14V)
10	W/G	Intake valve timing control solenoid valve (bank 2)	 [Engine is running] Warm-up condition When revving engine up to 2,500 rpm quickly 	7 - 12V*
				PBIB1790E

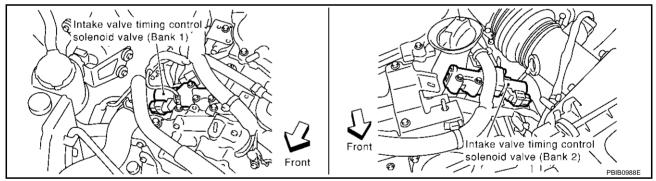
★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

ABS0088F

1. CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE POWER SUPPLY CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect intake valve timing control solenoid valve harness connector.

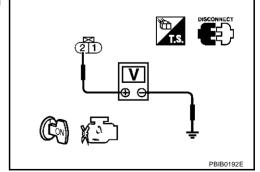


- 3. Turn ignition switch ON.
- 4. Check voltage between intake valve timing control solenoid valve terminal 2 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 3. NG >> GO TO 2.



Revision; 2004 April **EC-1061** 2003 G35 Sedan

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[TYPE 2]

$\overline{2}$. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Harness connectors F18, F201
- IPDM E/R harness connector E8
- Harness for open or short between intake valve timing control solenoid valve and IPDM E/R
 - >> Repair harness or connectors.

3. CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check harness continuity between ECM terminal 11 (bank 1) or 10 (bank 2) and intake valve timing control solenoid valve terminal 1. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 5. NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F18, F201
- Harness for open and short between ECM and intake valve timing control solenoid valve
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE

Refer to EC-1063, "Component Inspection".

OK or NG

OK >> GO TO 6.

NG >> Replace intake valve timing control solenoid valve.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

DTC P1111, P1136 IVT CONTROL SOLENOID VALVE

[TYPE 2]

Component Inspection INTAKE VALVE TIMING CONTROL SOLENOID VALVE

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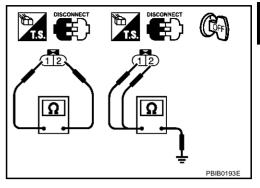
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- 1. Disconnect intake valve timing control solenoid valve harness connector.
- 2. Check resistance between intake valve timing control solenoid valve terminals as follows.

Terminals	Resistance
1 and 2	7.0 - 7.5Ω at 20°C (68°F)
1 or 2 and ground	${}^{\infty\Omega}$ (Continuity should not exist)



ABS0088H

Removal and Installation INTAKE VALVE TIMING CONTROL SOLENOID VALVE

Refer to EM-54, "TIMING CHAIN".

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[TYPE 2]

DTC P1121 ELECTRIC THROTTLE CONTROL ACTUATOR

PFP:16119

Component Description

ARSOORRI

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 feeds 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.

On Board Diagnosis Logic

ABS0088J

These self-diagnoses have the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition		Possible cause
P1121	Electric throttle control	A)	Electric throttle control actuator does not function properly due to the return spring malfunction.	
1121	actuator	B)	Throttle valve opening angle in fail-safe mode is not in specified range.	Electric throttle control actuator
		C)	ECM detects the throttle valve is stuck open.	

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Detected items	Engine operating condition in fail-safe mode		
Malfunction A	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.		
Malfunction B	ECM controls the electric throttle control actuator by regulating the throttle opening to 20 degrees or less.		
Malfunction C	While the vehicle is driving, 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.		

DTC Confirmation Procedure

ABS0088K

NOTE:

- Perform PROCEDURE FOR MALFUNCTION A AND B first. If the 1st trip DTC cannot be confirmed, perform PROCEDURE FOR MALFUNCTION C.
- If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

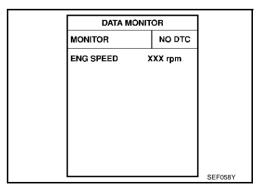
PROCEDURE FOR MALFUNCTION A AND B

(P) With CONSULT-II

- 1. Turn ignition switch ON and wait at least 1 second.
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- 3. Shift selector lever to D position (A/T), 1st position (M/T), and wait at least 2 seconds.
- 4. Shift selector lever to P position (A/T), Neutral position (M/T).
- 5. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON and wait at least 1 second.
- 7. Shift selector lever to D position (A/T), 1st position (M/T), and wait at least 2 seconds.
- 8. Shift selector lever to P position (A/T), Neutral position (M/T).
- Turn ignition switch OFF, wait at least 10 seconds, and then turn ON.
- 10. If DTC is detected, go to EC-1065, "Diagnostic Procedure".

With GST

Follow the procedure "With CONSULT-II" above.



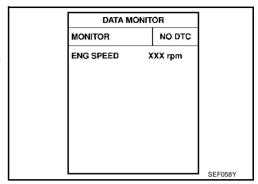
DTC P1121 ELECTRIC THROTTLE CONTROL ACTUATOR

[TYPE 2]

PROCEDURE FOR MALFUNCTION C

(P) With CONSULT-II

- 1. Turn ignition switch ON and wait at least 1 second.
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- 3. Shift selector lever to D position (A/T), 1st position (M/T), and wait at least 2 seconds.
- 4. Shift selector lever to N or P position (A/T), Neutral position (M/T).
- 5. Start engine and let it idle for 3 seconds.
- 6. If DTC is detected, go to EC-1065, "Diagnostic Procedure".



® With GST

Follow the procedure "With CONSULT-II" above.

Diagnostic Procedure

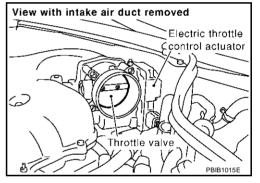
1. CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

- Remove the intake air duct.
- 2. Check if a foreign matter is caught between the throttle valve and the housing.

OK or NG

OK >> GO TO 2.

NG >> Remove the foreign matter and clean the electric throttle control actuator inside.



2. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

- Replace the electric throttle control actuator.
- Perform <u>EC-692</u>, "Throttle Valve Closed Position Learning".
- Perform <u>EC-692</u>, "Idle Air Volume Learning".

>> INSPECTION END

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[TYPE 2]

DTC P1122 ELECTRIC THROTTLE CONTROL FUNCTION

PFP:16119

ABSOORRM

Description

NOTE:

If DTC P1122 is displayed with DTC P1121 or 1126, first perform the trouble diagnosis for DTC P1121 or P1126. Refer to EC-1064 or EC-1072.

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 and it provides feedback to the ECM to control the throttle control motor to make the throttle valve opening angle properly in response to driving condition.

On Board Diagnosis Logic

ABSOORBN

This self-diagnosis has the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1122 1122	Electric throttle control performance problem	Electric throttle control function does not operate properly.	 Harness or connectors (Throttle control motor circuit is open or shorted) Electric throttle control actuator

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Engine operating condition in fail-safe mode

ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.

DTC Confirmation Procedure

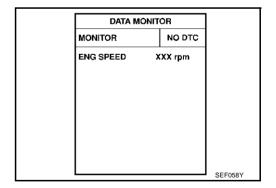
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NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

(III) WITH CONSULT-II

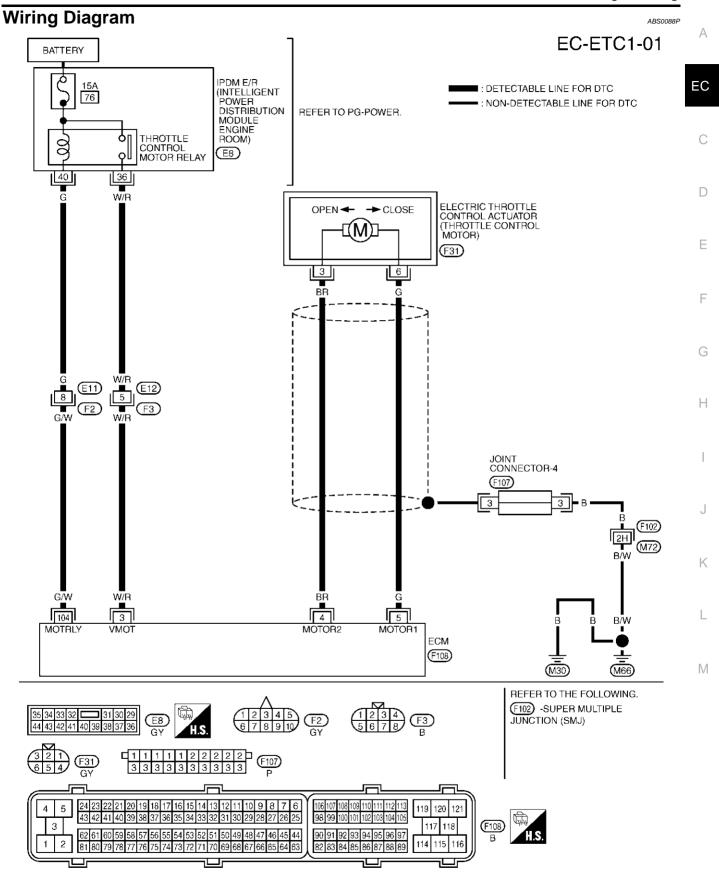
- Turn ignition switch ON and wait at least 2 seconds.
- Select "DATA MONITOR" mode with CONSULT-II.
- 3. Start engine and let it idle for 5 seconds.
- 4. If DTC is detected, go to EC-1068, "Diagnostic Procedure".



WITH GST

Follow the procedure "WITH CONSULT-II" above.

[TYPE 2]



TBWT0425E

[TYPE 2]

Specification data are reference values and are measured between each terminal and ground. Pulse signal is measured by CONSULT-II.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
3	W/R	Throttle control motor relay power supply	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14V)
4	BR	Throttle control motor (Close)	[Ignition switch: ON] • Engine stopped • Shift lever: D (A/T), 1st (M/T) • Accelerator pedal is releasing	0 - 14V★ → 5 v/Div 1 ms/Div T PBIB1104E
5	G	Throttle control motor (Open)	 [Ignition switch: ON] Engine stopped Shift lever: D (A/T), 1st (M/T) Accelerator pedal is depressing 	0 - 14V★ → 1 ms/0iv T PBIB1105E
104	G/W	Throttle control motor relay	[Ignition switch: OFF]	BATTERY VOLTAGE (11 - 14V)
			[Ignition switch: ON]	0 - 1.0V

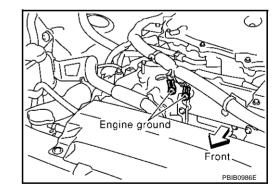
Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

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- 1. Turn ignition switch OFF.
- 2. Loosen and retighten engine ground screws.

>> GO TO 2.

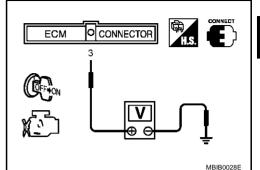


[TYPE 2]

$\overline{2}$. CHECK THROTTLE CONTROL MOTOR RELAY INPUT SIGNAL CIRCUIT-I

1. Check voltage between ECM terminal 3 and ground under the following conditions with CONSULT-II or tester.

Ignition switch	Voltage	
OFF	Approximately 0V	
ON	Battery voltage (11 - 14V)	



OK or NG

OK >> GO TO 10. NG >> GO TO 3.

3. CHECK THROTTLE CONTROL MOTOR RELAY INPUT SIGNAL CIRCUIT-II

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Disconnect IPDM E/R harness connector E8.
- 4. Check continuity between ECM terminal 3 and IPDM E/R terminal 36. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 5. NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Harness for open or short between ECM and IPDM E/R

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

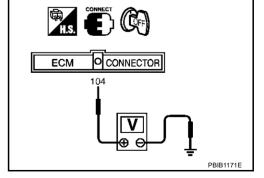
5. CHECK THROTTLE CONTROL MOTOR RELAY POWER SUPPLY CIRCUIT-I

- 1. Reconnect all harness connectors disconnected.
- 2. Check voltage between ECM terminal 104 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 9. NG >> GO TO 6.



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Revision; 2004 April EC-1069 2003 G35 Sedan

6. CHECK THROTTLE CONTROL MOTOR RELAY POWER SUPPLY CIRCUIT-II

- Disconnect ECM harness connector.
- 2. Disconnect IPDM E/R harness connector E8.
- Check continuity between ECM terminal 104 and IPDM E/R terminal 40. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 8. NG >> GO TO 7.

7. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E11, F2
- Harness for open or short between ECM and IPDM E/R
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

8. CHECK FUSE

- 1. Disconnect 15A fuse.
- 2. Check 15A fuse for blown.

OK or NG

OK >> GO TO 9.

NG >> Replace 15A fuse.

9. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

OK or NG

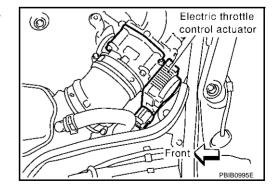
OK >> Replace IPDM E/R. Refer to PG-16, "IPDM E/R (INTELLIGENT POWER DISTRIBUTION MOD-ULE ENGINE ROOM)".

NG >> Repair or replace harness or connectors.

10. check throttle control motor output signal circuit for open or short

- 1. Turn ignition switch OFF.
- 2. Disconnect electric throttle control actuator harness connector.
- Disconnect ECM harness connector.
- 4. Check harness continuity between the following terminals. Refer to Wiring Diagram.

Electric throttle control actuator terminal	ECM terminal	Continuity
3	5	Should not exist
3	4	Should exist
6	5	Should exist
0	4	Should not exist



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

OK or NG

OK >> GO TO 11.

NG >> Repair or replace.

[TYPE 2]

11. CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

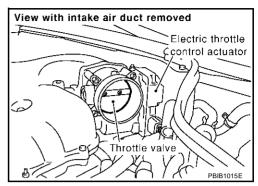
- Remove the intake air duct.
- 2. Check if foreign matter is caught between the throttle valve and the housing.

OK or NG

OK >> GO TO 12.

NG

>> Remove the foreign matter and clean the electric throttle control actuator inside.



12. CHECK THROTTLE CONTROL MOTOR

Refer to EC-1071, "Component Inspection".

OK or NG

OK >> GO TO 13.

NG >> GO TO 14.

13. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> GO TO 14.

NG >> Repair or replace harness or connectors.

14. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

- 1. Replace the electric throttle control actuator.
- Perform <u>EC-692</u>, "Throttle Valve Closed Position Learning".
- 3. Perform EC-692, "Idle Air Volume Learning".

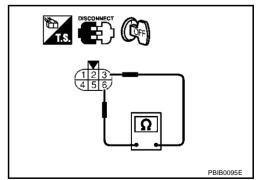
>> INSPECTION END

Component Inspection THROTTLE CONTROL MOTOR

- 1. Disconnect electric throttle control actuator harness connector.
- Check resistance between terminals 3 and 6.

Resistance: Approximately 1 - 15 Ω [at 25 °C (77°F)]

- 3. If NG, replace electric throttle control actuator and go to next step.
- 4. Perform EC-692, "Throttle Valve Closed Position Learning".
- 5. Perform EC-692, "Idle Air Volume Learning".



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Remove and Installation ELECTRIC THROTTLE CONTROL ACTUATOR

Refer to EM-18, "INTAKE MANIFOLD COLLECTOR".

Revision; 2004 April **EC-1071** 2003 G35 Sedan

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DTC P1124, P1126 THROTTLE CONTROL MOTOR RELAY

[TYPE 2]

DTC P1124, P1126 THROTTLE CONTROL MOTOR RELAY

PFP:16119

Component Description

ABSOORRT

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.

CONSULT-II Reference Value in Data Monitor Mode

ABS0088U

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
THRTL RELAY	• Ignition switch: ON	ON

On Board Diagnosis Logic

ABS0088V

These self-diagnoses have the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1124 1124	Throttle control motor relay circuit short	ECM detects the throttle control motor relay is stuck ON.	Harness or connectors (Throttle control motor relay circuit is shorted) Throttle control motor relay
P1126 1126	Throttle control motor relay circuit open	ECM detects a voltage of power source for throttle control motor is excessively low.	 Harness or connectors (Throttle control motor relay circuit is open) Throttle control motor relay

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Engine operating condition in fail-safe mode

ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.

DTC Confirmation Procedure

ABS0088W

NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

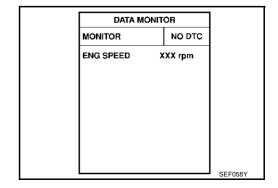
PROCEDURE FOR DTC P1124

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

(P) With CONSULT-II

- 1. Turn ignition switch ON and wait at least 1 second.
- Select "DATA MONITOR" mode with CONSULT-II.
- 3. If DTC is detected, go to EC-1075, "Diagnostic Procedure".



DTC P1124, P1126 THROTTLE CONTROL MOTOR RELAY

[TYPE 2]

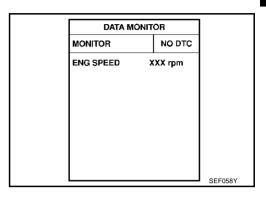
With GST

Follow the procedure "With CONSULT-II" above.

PROCEDURE FOR DTC P1126

(P) With CONSULT-II

- 1. Turn ignition switch ON and wait at least 2 seconds.
- 2. Select "DATA MONITOR""mode with CONSULT-II.
- 3. Start engine and let it idle for 5 seconds.
- 4. If DTC is detected, go to EC-1075, "Diagnostic Procedure".



® With GST

Follow the procedure "With CONSULT-II" above.

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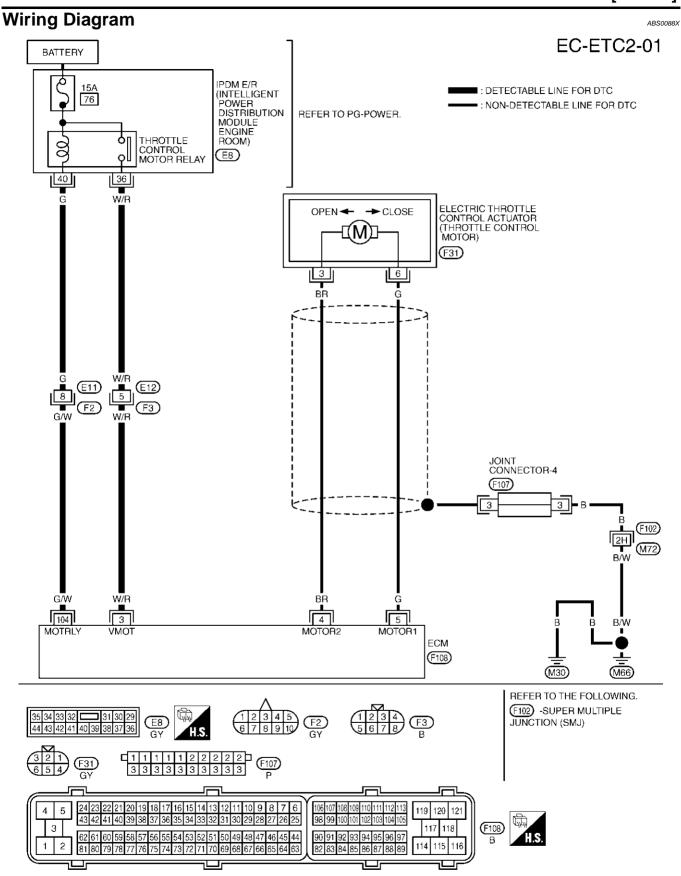
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DTC P1124, P1126 THROTTLE CONTROL MOTOR RELAY

[TYPE 2]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
3	W/R	Throttle control motor relay power supply	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14V)
104	G/W	Throttle control motor relay	[Ignition switch: OFF]	BATTERY VOLTAGE (11 - 14V)
			[Ignition switch: ON]	0 - 1.0V

Diagnostic Procedure

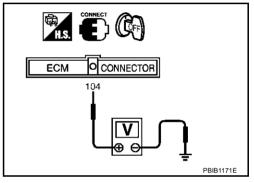
1. CHECK THROTTLE CONTROL MOTOR RELAY POWER SUPPLY CIRCUIT-I

- 1. Turn ignition switch OFF.
- 2. Check voltage between ECM terminal 104 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 5. NG >> GO TO 2.



2. CHECK THROTTLE CONTROL MOTOR RELAY POWER SUPPLY CIRCUIT-II

- 1. Disconnect ECM harness connector.
- 2. Disconnect IPDM E/R harness connector E8.
- Check continuity between ECM terminal 104 and IPDM E/R terminal 40. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 4. NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E11, F2
- Harness for open or short between ECM and IPDM E/R
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

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4. CHECK FUSE

- 1. Disconnect 15A fuse.
- 2. Check 15A fuse for blown.

OK or NG

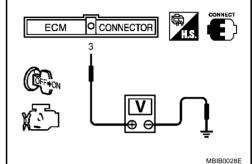
OK >> GO TO 8.

NG >> Replace 15A fuse.

5. CHECK THROTTLE CONTROL MOTOR RELAY INPUT SIGNAL CIRCUIT-I

1. Check voltage between ECM terminal 3 and ground under the following conditions with CONSULT-II or tester.

Ignition switch	Voltage
OFF	Approximately 0V
ON	Battery voltage (11 - 14V)



OK or NG

OK >> GO TO 8. NG >> GO TO 6.

6. CHECK THROTTLE CONTROL MOTOR RELAY INPUT SIGNAL CIRCUIT-II

- 1. Turn ignition switch OFF.
- Disconnect ECM harness connector.
- 3. Disconnect IPDM E/R harness connector E8.
- Check continuity between ECM terminal 3 and IPDM E/R terminal 36. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 8. NG >> GO TO 7.

7. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Harness for open or short between ECM and IPDM E/R
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

8. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

OK or NG

OK >> Replace IPDM E/R. Refer to <u>PG-16, "IPDM E/R (INTELLIGENT POWER DISTRIBUTION MOD-ULE ENGINE ROOM)"</u>.

NG >> Repair or replace harness or connectors.

DTC P1128 THROTTLE CONTROL MOTOR

[TYPE 2]

DTC P1128 THROTTLE CONTROL MOTOR

PFP:16119

Component Description

ABS0088Z

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 and it provides feedback to the ECM to control the throttle control motor to make the throttle valve opening angle properly in response to driving condition.

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On Board Diagnosis Logic

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This self-diagnosis has the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1128 1128	Throttle control motor circuit short	ECM detects short in both circuits between ECM and throttle control motor.	Harness or connectors (Throttle control motor circuit is shorted.) Electric throttle control actuator (Throttle control motor)

FAIL-SAFE MODE

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When the malfunction is detected, the ECM enters fail-safe mode and the MIL lights up.

Engine operating condition in fail-safe mode

ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.

DTC Confirmation Procedure

ABS00891

NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

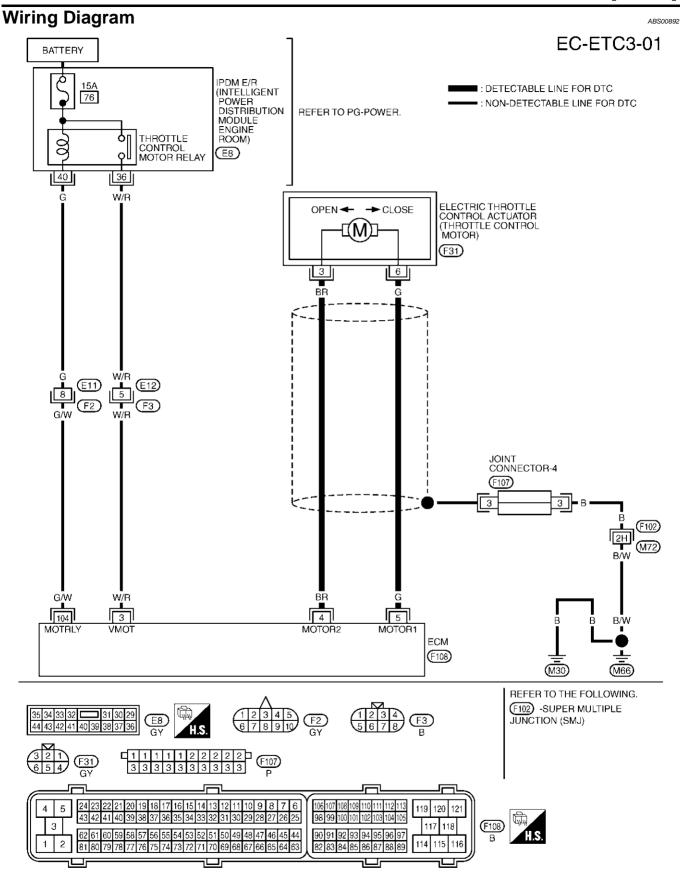
(P) WITH CONSULT-II

- 1. Turn ignition switch ON and wait at least 2 seconds.
- Select "DATA MONITOR" mode with CONSULT-II.
- 3. Start engine and let it idle for 5 seconds.
- If DTC is detected, go to <u>EC-1079</u>, "<u>Diagnostic Procedure</u>".

DATA M	DATA MONITOR	
MONITOR	NO DTC	
ENG SPEED	XXX rpm	
		SEF058Y

® WITH GST

Follow the procedure "WITH CONSULT-II" above.



TBWT0427E

DTC P1128 THROTTLE CONTROL MOTOR

[TYPE 2]

Specification data are reference values and are measured between each terminal and ground. Pulse signal is measured by CONSULT-II.

CAUTION:

Do not 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.

			<u> </u>	
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
4	BR	Throttle control motor (Close)	 [Ignition switch: ON] Engine stopped Shift lever: D (A/T), 1st (M/T) Accelerator pedal is releasing 	0 - 14V★
5	G	Throttle control motor (Open)	 [Ignition switch: ON] Engine stopped Shift lever: D (A/T), 1st (M/T) Accelerator pedal is depressing 	0 - 14V★ >>> 5 V/Div 1 ms/Div T PBIB1105E

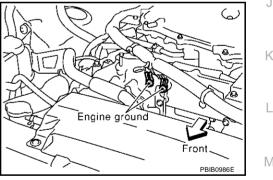
^{★:} Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

- Turn ignition switch OFF.
- Loosen and retighten engine ground screws.

>> GO TO 2.



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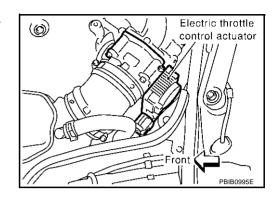
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ABS00893

$\overline{2}$. 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.
- 4. Check harness continuity between the following terminals. Refer to Wiring Diagram.

Electric throttle control actuator terminal	ECM terminal	Continuity
2	5	Should not exist
3	4	Should exist
6	5	Should exist
O	4	Should not exist



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

OK or NG

OK >> GO TO 3.

NG >> Repair or replace.

3. CHECK THROTTLE CONTROL MOTOR

Refer to EC-1080, "Component Inspection".

OK or NG

OK >> GO TO 4. NG >> GO TO 5.

4. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

OK or NG

OK >> GO TO 5.

NG >> Repair or replace harness or connectors.

5. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

- 1. Replace the electric throttle control actuator.
- 2. Perform EC-692, "Throttle Valve Closed Position Learning".
- 3. Perform EC-692, "Idle Air Volume Learning".

>> INSPECTION END

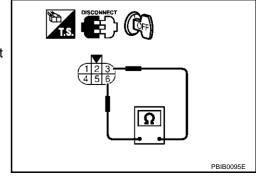
Component Inspection THROTTLE CONTROL MOTOR

ABS00894

- 1. Disconnect electric throttle control actuator harness connector.
- Check resistance between terminals 3 and 6.

Resistance: Approximately 1 - 15 Ω [at 25 °C (77°F)]

- 3. If NG, replace electric throttle control actuator and go to next step.
- 4. Perform EC-692, "Throttle Valve Closed Position Learning".
- 5. Perform EC-692, "Idle Air Volume Learning".



DTC P1128 THROTTLE CONTROL MOTOR

[TYPE 2]

Removal and Installation ELECTRIC THROTTLE CONTROL ACTUATOR

Refer to EM-18, "INTAKE MANIFOLD COLLECTOR".

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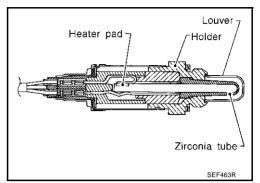
DTC P1143, P1163 HO2S1

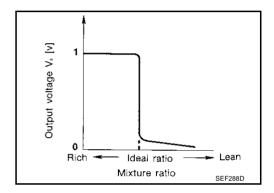
PFP:22690

Component Description

ABS00896

The heated oxygen sensor 1 is placed into the exhaust manifold. It detects the amount of oxygen in the exhaust gas compared to the outside air. The heated oxygen sensor 1 has a closed-end tube made of ceramic zirconia. The zirconia generates voltage from approximately 1V in richer conditions to 0V in leaner conditions. The heated oxygen sensor 1 signal is sent to the ECM. The ECM adjusts the injection pulse duration to achieve the ideal air-fuel ratio. The ideal air-fuel ratio occurs near the radical change from 1 to 0V.





CONSULT-II Reference Value in Data Monitor Mode

ABS00897

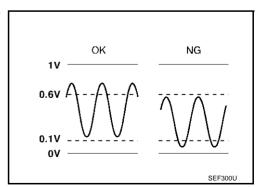
Specification data are reference values.

MONITOR ITEM	CON	SPECIFICATION	
HO2S1 (B1) HO2S1 (B2)	Engine: After warming up	Maintaining engine speed at 2,000 rpm	0 - 0.3V ←→ Approx. 0.6 - 1.0V
HO2S1 MNTR (B1) HO2S1 MNTR (B2)	Engine: After warming up	Maintaining engine speed at 2,000 rpm	LEAN ←→ RICH Changes more than 5 times during 10 seconds.

On Board Diagnosis Logic

ABS00898

To judge the malfunction, the output from the heated oxygen sensor 1 is monitored to determine whether the "rich" output is sufficiently high and whether the "lean" output is sufficiently low. When both the outputs are shifting to the lean side, the malfunction will be detected.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1143			Heated oxygen sensor 1
1143 (Bank 1)	11	The maximum and minimum voltage from the sensor are not reached to the specified volt-	Heated oxygen sensor 1 heater
	Heated oxygen sensor 1 lean shift monitoring		Fuel pressure
P1163 1163	1 lean shift monitoning	ages.	Injectors
(Bank 2)			Intake air leaks

DTC Confirmation Procedure

ABS0094P

CAUTION:

Always drive vehicle at a safe speed.

NOTE

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

- Always perform at a temperature above –10°C (14°F).
- Before performing following procedure, confirm that battery voltage is more than 11V at idle.

(P) WITH CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- 2. Stop engine and wait at least 10 seconds.
- 3. Turn ignition switch ON and select "HO2S1 (B1) P1143" of "HO2S1" or "HO2S1 (B2) P1163" of "HO2S1" in "DTC WORK SUPPORT" mode with CONSULT-II.
- 4. Touch "START".
- 5. Start engine and let it idle for at least 3 minutes.

NOTE:

Never raise engine speed above 3,600 rpm after this step. If the engine speed limit is exceeded, return to step 5.

HO2\$1 (B1) P1	143	
OUT OF CONDI		
MONITOR		
ENG SPEED		
B/FUEL SCHDL	XXX msec	
COOLAN TEMP/S		
VHCL SPEED SEN		
		PBIB0546E

When the following conditions are met, "TESTING" will be displayed on the CONSULT-II screen. Maintain the conditions continuously until "TESTING" changes to "COMPLETED". (It will take approximately 40 seconds or more.)

ENG SPEED	1,200 - 2,600 rpm
Vehicle speed	Less than 100 km/h (62 MPH)
B/FUEL SCHDL	2.5 - 12.0 msec
Selector lever	Suitable position

If "TESTING" is not displayed after 5 minutes, retry from step 2.

7. Make sure that "OK" is displayed after touching "SELF-DIAG RESULTS". If "NG" is displayed, refer to EC-1084, "Diagnostic Procedure".

HO2\$1 (B1) P1		
TESTING		
MONITOR		
ENG SPEED	XXX rpm	
B/FUEL SCHDL	XXX msec	
COOLAN TEMP/S	xxx °c	
VHCL SPEED SEN	XXX km/h	DDIDOC47E
		PBIB0547E

HO2S1 (B1) P1143	
COMPLETED	
	SEC769C

Revision; 2004 April EC-1083 2003 G35 Sedan

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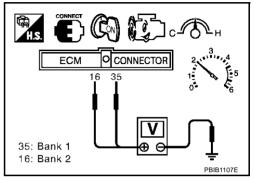
Overall Function Check

18000040

Use this procedure to check the overall function of the heated oxygen sensor 1 circuit. During this check, a DTC might not be confirmed.

WITH GST

- 1. Start engine and warm it up to normal operating temperature.
- Set voltmeter probes between ECM terminal 35 [HO2S1(B1) signal] or 16 [HO2S1(B2) signal] and engine ground.
- 3. Check one of the following with engine speed held at 2,000 rpm constant under no load.
 - The maximum voltage is over 0.6V at least one time.
 - The minimum voltage is over 0.1V at least one time.
- 4. If NG, go to EC-1084, "Diagnostic Procedure".



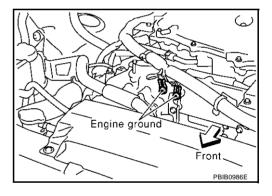
ABS0089B

Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

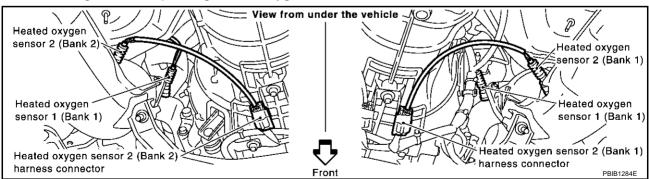
- 1. Turn ignition switch OFF.
- 2. Loosen and retighten engine ground screws.

>> GO TO 2.



2. RETIGHTEN HEATED OXYGEN SENSOR 1

Loosen and retighten corresponding heated oxygen sensor 1.



Tightening torque: 40 - 50 N·m (4.1 - 5.1 kg-m, 30 - 37 ft-lb)

>> GO TO 3.

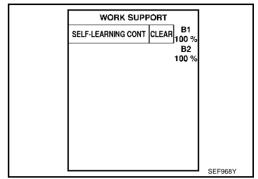
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3. CLEAR THE SELF-LEARNING DATA

(P) With CONSULT-II

- Start engine and warm it up to normal operating temperature.
- Select "SELF-LEARNING CONT" in "WORK SUPPORT" mode with CONSULT-II.
- Clear the self-learning control coefficient by touching "CLEAR".
- 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?



Without CONSULT-II

- Start engine and warm it up to normal operating temperature.
- Turn ignition switch OFF.
- Disconnect mass air flow sensor harness connector, and restart and run engine for at least 5 seconds at idle speed.
- Stop engine and reconnect mass air flow sensor harness connector.
- 5. Make sure DTC P0102 is displayed.
- 6. Erase the DTC memory. Refer to EC-710, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION".
- Make sure DTC P0000 is displayed.
- 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, P0174. Refer to EC-905.

No >> GO TO 4.

4. CHECK HEATED OXYGEN SENSOR 1 HEATER

Refer to EC-801, "Component Inspection".

OK or NG

OK >> GO TO 5.

NG >> Replace malfunctioning heated oxygen sensor 1.

5. CHECK HEATED OXYGEN SENSOR 1

Refer to EC-1086, "Component Inspection".

OK or NG

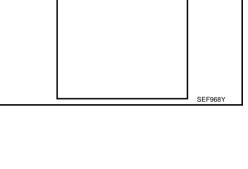
OK >> GO TO 6.

NG >> Replace malfunctioning heated oxygen sensor 1.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT". For circuit, refer to EC-852, "Wiring Diagram".

>> INSPECTION END



1 VAV Mass air flow sensor (with intake air temperature sensor)

PBIB1077

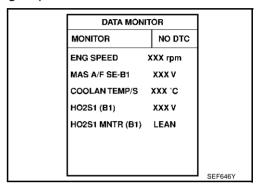
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Component Inspection HEATED OXYGEN SENSOR 1

ABS00890

(With CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- Select "MANU TRIG" and adjust "TRIGGER POINT" to 100% in "DATA MONITOR" mode with CONSULT-II.
- 3. Select "HO2S1 (B1)/(B2)" and "HO2S1 MNTR (B1)/(B2)".
- 4. Hold engine speed at 2,000 rpm under no load during the following steps.
- Touch "RECORD" on CONSULT-II screen.



- 6. Check the following.
 - "HO2S1 MNTR (B1)/(B2)" in "DATA MONITOR" mode changes from "RICH" to "LEAN" to "RICH" 5 times in 10 seconds.
 - 5 times (cycles) are counted as shown at right.
 - "HO2S1 (B1)/(B2)" voltage goes above 0.6V at least once.
 - "HO2S1 (B1)/(B2)" voltage goes below 0.3V at least once.
 - "HO2S1 (B1)/(B2)" voltage never exceeds 1.0V.

Trigger	ENG SPEED	HO2S1 (B1)	128			Maximu	ım (C)		<u>ر</u> ې	,-		^		Maximum voltage should be over 0.6V
	rpm	V	1		1)	$I(\lambda)$	- 1	- /	ĺ	`	- 1	<i>)</i>	at least one time.
XXX	XXX	XXX	l											
XXX	XXX	XXX			•					г	1	•		
XXX	XXX	XXX] .											
XXX	XXX	XXX	[76-	1	•			1			•	•	•	N 40 4
XXX	XXX	XXX	1	.										 Minimum voltage
XXX	XXX	XXX		i		- i - ;	į	- 1	į.	i		i	ļ.	should be below 0.30V
XXX	XXX	XXX		\mathbb{R}^{-i}		i	1	i	- 1	i	i i	i	1	at least one time.
XXX	XXX	XXX]	$\mathbb{R} - I$		1 !	1	1	i i	- !	- į	!	i	
XXX	XXX	XXX		1 /		1 /		V(I)	ì	. 1	١,	;	· i	
XXX	XXX	XXX	1			N.		V		`	`,	J.	`_	
XXX	XXX	XXX								Mini	mum	1		
XXX	XXX	XXX]											
			5											SEF648Y

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 tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.

® Without CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- 2. Set voltmeter probes between ECM terminal 35 [HO2S1 (B1) signal] or 16 [HO2S1 (B2) signal] and engine ground.
- Check the following with engine speed held at 2,000 rpm constant under no load.
 - The voltage fluctuates between 0 to 0.3V and 0.6 to 1.0V more than 5 times within 10 seconds.
 - The maximum voltage is over 0.6V at least one time.
 - The minimum voltage is below 0.3V at least one time.
 - The voltage never exceeds 1.0V.

1 time: $0 - 0.3V \rightarrow 0.6 - 1.0V \rightarrow 0 - 0.3V$

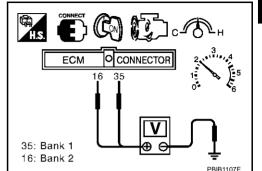
2 times: $0 - 0.3V \rightarrow 0.6 - 1.0V \rightarrow 0 - 0.3V \rightarrow 0.6 - 1.0V$

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 tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.

Removal and Installation HEATED OXYGEN SENSOR 1

Refer to EM-24, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .



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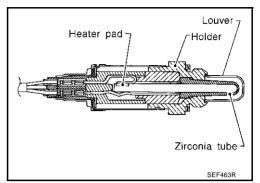
DTC P1144, P1164 HO2S1

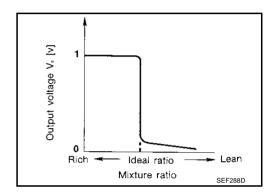
PFP:22690

Component Description

ABS0089E

The heated oxygen sensor 1 is placed into the exhaust manifold. It detects the amount of oxygen in the exhaust gas compared to the outside air. The heated oxygen sensor 1 has a closed-end tube made of ceramic zirconia. The zirconia generates voltage from approximately 1V in richer conditions to 0V in leaner conditions. The heated oxygen sensor 1 signal is sent to the ECM. The ECM adjusts the injection pulse duration to achieve the ideal air-fuel ratio. The ideal air-fuel ratio occurs near the radical change from 1 to 0V.





CONSULT-II Reference Value in Data Monitor Mode

ABS0089F

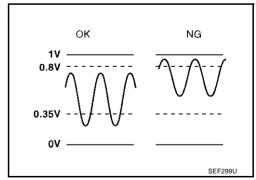
Specification data are reference values.

MONITOR ITEM	CON	SPECIFICATION	
HO2S1 (B1) HO2S1 (B2)	Engine: After warming up	Maintaining engine speed at 2,000 rpm	0 - 0.3V ←→ Approx. 0.6 - 1.0V
HO2S1 MNTR (B1) HO2S1 MNTR (B2)	Engine: After warming up	Maintaining engine speed at 2,000 rpm	LEAN ←→ RICH Changes more than 5 times during 10 seconds.

On Board Diagnosis Logic

ABS0089G

To judge the malfunction, the output from the heated oxygen sensor 1 is monitored to determine whether the "rich" output is sufficiently high and "lean" output is sufficiently low. When both the outputs are shifting to the rich side, the malfunction will be detected.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1144 1144 (Bank 1) P1164 1164 (Bank 2)	Heated oxygen sensor 1 rich shift monitoring	The maximum and minimum voltages from the sensor are beyond the specified voltages.	 Heated oxygen sensor 1 Heated oxygen sensor 1 heater Fuel pressure Injectors

DTC Confirmation Procedure

ABS0094R

CAUTION:

Always drive vehicle at a safe speed.

NOTE

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

- Always perform at a temperature above –10°C (14°F).
- Before performing the following procedure, confirm that battery voltage is more than 11V at idle.

(P) WITH CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- 2. Stop engine and wait at least 5 seconds.
- 3. Turn ignition switch ON and select "HO2S1 (B1) P1144" or "HO2S1 (B2) P1164" of "HO2S1" in "DTC WORK SUPPORT" mode with CONSULT-II.
- 4. Touch "START".
- 5. Start engine and let it idle for at least 3 minutes.

NOTE:

Never raise engine speed above 3,600 rpm after this step. If the engine speed limit is exceeded, return to step 5.

HO2S1 (B1) P1	144	
OUT OF CONDI		
MONITOR		
ENG SPEED		
B/FUEL SCHDL	XXX msec	
COOLAN TEMP/S		
VHCL SPEED SEN	XXX km/h	
	•	PBIB0548E

When the following conditions are met, "TESTING" will be displayed on the CONSULT-II screen. Maintain the conditions continuously until "TESTING" changes to "COMPLETED". (It will take approximately 40 seconds or more.)

ENG SPEED	1,200 - 2,600 rpm
Vehicle speed	Less than 100 km/h (62 MPH)
B/FUEL SCHDL	2.5 - 12.0 msec
Selector lever	Suitable position

If "TESTING" is not displayed after 5 minutes, retry from step 2.

7. Make sure that "OK" is displayed after touching "SELF-DIAG RESULTS". If "NG" is displayed, refer to EC-1090, "Diagnostic Procedure".

HO2\$1 (B1) P1	144	
TESTING		
MONITOR		
ENG SPEED	XXX rpm	
B/FUEL SCHDL	XXX msec	
COOLAN TEMP/S	xxx c	
VHCL SPEED SEN	XXX km/h	DDIDOC 40E
		PBIB0549E

HO2S1 (B1) P1144	
COMPLETED	
	SEC772C

Revision; 2004 April EC-1089 2003 G35 Sedan

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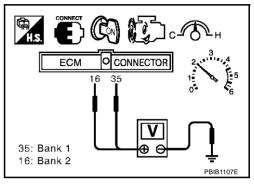
Overall Function Check

BS0004S

Use this procedure to check the overall function of the heated oxygen sensor 1 circuit. During this check, a DTC might not be confirmed.

WITH GST

- 1. Start engine and warm it up to normal operating temperature.
- Set voltmeter probes between ECM terminal 35 [HO2S1(B1) signal] 16 [HO2S1(B2) signal] and engine ground.
- 3. Check one of the following with engine speed held at 2,000 rpm constant under no load.
 - The maximum voltage is below 0.8V at least one time.
 - The minimum voltage is below 0.35V at least one time.
- 4. If NG, go to EC-1090, "Diagnostic Procedure".



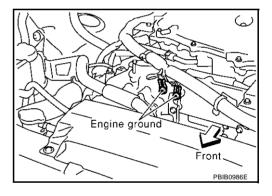
ABS0089J

Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

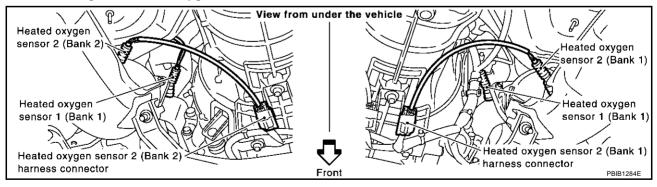
- 1. Turn ignition switch OFF.
- 2. Loosen and retighten engine ground screws.

>> GO TO 2.



2. RETIGHTEN HEATED OXYGEN SENSOR 1

Loosen and retighten heated oxygen sensor 1.



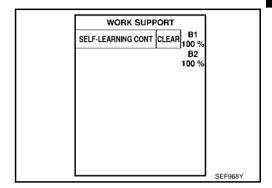
Tightening torque: 40 - 50 N·m (4.1 - 5.1 kg-m, 30 - 37 ft-lb)

>> GO TO 3.

3. CLEAR THE SELF-LEARNING DATA

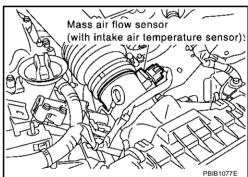
(II) With CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- Select "SELF-LEARNING CONT" in "WORK SUPPORT" mode with CONSULT-II.
- Clear the self-learning control coefficient by touching "CLEAR".
- 4. 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?



(X) Without CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- Turn ignition switch OFF.
- 3. Disconnect mass air flow sensor harness connector, and restart and run engine for at least 5 seconds at idle speed.
- Stop engine and reconnect mass air flow sensor harness connector.
- 5. Make sure DTC P0102 is displayed.
- 6. Erase the DTC memory. Refer to <u>EC-710</u>, "HOW TO ERASE <u>EMISSION-RELATED DIAGNOSTIC INFORMATION"</u>.
- Make sure DTC P0000 is displayed.
- 8. 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 or No

Yes >> Perform trouble diagnosis for DTC P0172, P0175. Refer to EC-914.

No >> GO TO 4.

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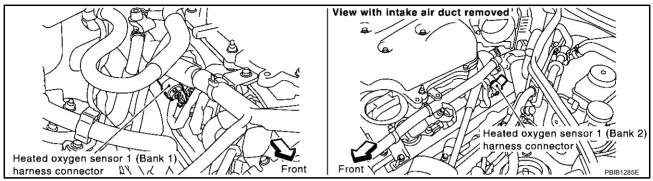
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4. CHECK HO2S1 CONNECTOR FOR WATER

- 1. Turn ignition switch OFF.
- 2. Disconnect heated oxygen sensor 1 harness connector.



Check connectors for water.

Water should not exist.

OK or NG

OK >> GO TO 5.

NG >> Repair or replace harness or connectors.

5. CHECK HEATED OXYGEN SENSOR 1 HEATER

Refer to EC-801, "Component Inspection".

OK or NG

OK >> GO TO 6.

NG >> Replace malfunctioning heated oxygen sensor 1.

6. CHECK HEATED OXYGEN SENSOR 1

Refer to EC-1092, "Component Inspection".

OK or NG

OK >> GO TO 7.

NG >> Replace malfunctioning heated oxygen sensor 1.

7. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

For circuit, refer to EC-852, "Wiring Diagram".

>> INSPECTION END

Component Inspection HEATED OXYGEN SENSOR 1

ABS0089K

(With CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- 2. Select "MANU TRIG" and adjust "TRIGGER POINT" to 100% in "DATA MONITOR" mode with CONSULT-II.
- 3. Select "HO2S1 (B1)" and "HO2S1 MNTR (B1)".
- 4. Hold engine speed at 2,000 rpm under no load during the following steps.

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Touch "RECORD" on CONSULT-II screen.

DATA MON	ITOR		
MONITOR	NO DTC		
ENG SPEED	XXX rpm		
MAS A/F SE-B1	xxx v		
COOLAN TEMP/S	XXX .C		
HO2S1 (B1)	XXX V		
HO2S1 MNTR (B1)	LEAN		
		SEF646Y	

- Check the following.
 - "HO2S1 MNTR (B1)/(B2)" in "DATA MONITOR" mode changes from "RICH" to "LEAN" to "RICH" 5 times in 10 seconds.
 - 5 times (cycles) are counted as shown at right.
 - "HO2S1 (B1)/(B2)" voltage goes above 0.6V at least once.
 - "HO2S1 (B1)/(B2)" voltage goes below 0.3V at least once.
 - "HO2S1 (B1)/(B2)" voltage never exceeds 1.0V.

Bank 1	cle	1 2 3	4 5
_ · ·	0.0	1.1-10	1 . 1 . 1
HO2S1 MI	NTR (B1)	R-L-R-L-R-L	-R-L-R-L-R
Bank 2			
cy	cle	1 2 3	4 5
HO2S1 M	NTR (B2)	R-L-R-L-R-L	-R-L-R-L-R
R means HO	2S1		
MNTR (B1)/(I	B2) indica	ates RICH	
L means HO	2S1		
MNTR (B1)/(I	B2) indica	ates LEAN	SEF647Y
L means HO	251		SEF647Y

Trigger	ENG SPEED	HO2S1 (B1)		128			1axii	mum			<u>ر</u> .		<i>ا</i> ر.		<i>^</i>	·.	 Maximum voltage should be over 0.6V
	rpm	V				/ N		- 1	À	- 1	À		/ \	1	- /	<i>)</i>	at least one time.
XXX	XXX	XXX						•	•	,	•			•		-	at loads one time.
XXX	XXX	XXX				•		1	1	•		Г		1	•		
XXX	XXX	XXX															
XXX	XXX	XXX		64			1	:		1				•	1		
XXX	XXX	XXX		-													 Minimum voltage
XXX	XXX	XXX			i !		i	!	i	- !	i	- 1		1	-	į	should be below 0.30\
XXX	XXX	XXX			1		1	i	1	i	١.	i		1	i	1	at least one time.
XXX	XXX	XXX			V = I		i	!	١,	- !	١.			i	!	i	
XXX	XXX	XXX			i /		ì	!	Ì	- /	į	V/I		١,	•	į.	
XXX	XXX	XXX			W		`\.	<i>i</i>	,	, i		`•		`./		Υ.	
XXX	XXX	XXX										_ Mi	nim	um			
XXX	XXX	XXX	1		l												

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 tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.

₩ Without CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- Set voltmeter probes between ECM terminal 35 [HO2S1 (B1) signal] or 16 [HO2S1 (B2) signal] and engine ground.
- Check the following with engine speed held at 2,000 rpm constant under no load.
 - The voltage fluctuates between 0 to 0.3V and 0.6 to 1.0V more than 5 times within 10 seconds.
 - The maximum voltage is over 0.6V at least one time.
 - The minimum voltage is below 0.3V at least one time.
 - The voltage never exceeds 1.0V.

1 time: 0 - 0.3V \to 0.6 - 1.0V \to 0 - 0.3V 2 times: 0 - 0.3V \to 0.6 - 1.0V \to 0 - 0.3V \to 0.6 - 1.0V

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.

ECM OCONNECTOR

16 35

35: Bank 1
16: Bank 2

DTC P1144, P1164 HO2S1

[TYPE 2]

• Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.

Removal and Installation HEATED OXYGEN SENSOR 1

ABS0089L

Refer to EM-24, "EXHAUST MANIFOLD AND THREE WAY CATALYST".

DTC P1146, P1166 HO2S2

PFP:226A0

Component Description

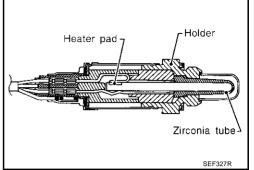
ARSOOROM

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 heated oxygen 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 1V in richer conditions to 0V in leaner conditions.

Under normal conditions the heated oxygen sensor 2 is not used for engine control operation.



CONSULT-II Reference Value in Data Monitor Mode

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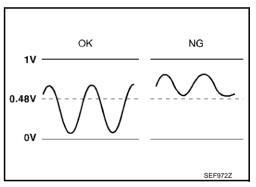
Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
HO2S2 (B1) HO2S2 (B2)	Warm-up condition After keeping engine speed	Revving engine from idle to 3,000 rpm	0 - 0.3V ←→ Approx. 0.6 - 1.0V
HO2S2 MNTR (B1) HO2S2 MNTR (B2)	between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	quickly.	$LEAN \longleftrightarrow RICH$

On Board Diagnosis Logic

ABS00890

The heated oxygen sensor 2 has a much longer switching time between rich and lean than the heated oxygen sensor 1. The oxygen storage capacity of the three way catalyst causes the longer switching time. To judge the malfunctions of heated oxygen sensor 2, ECM monitors whether the minimum voltage of sensor is sufficiently low during the various driving condition such as fuel-cut.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1146 1146 (Bank 1)	Heated oxygen sensor	The minimum voltage from the sensor is not	Harness or connectors (The sensor circuit is open or shorted) Heated oxygen sensor 2
P1166 1166 (Bank 2)	2 minimum voltage monitoring	reached to the specified voltage.	Fuel pressureInjectors

EC-1095 Revision; 2004 April 2003 G35 Sedan

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DTC Confirmation Procedure

ABS0089P

NOTE:

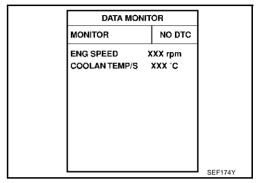
If DTC confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

(P) WITH CONSULT-II

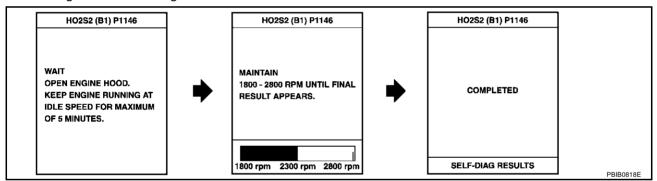
TESTING CONDITION:

For better results, perform "DTC WORK SUPPORT" at a temperature of 0 to 30 °C (32 to 86 °F).

- Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-II.
- 2. Start engine and warm it up to the normal operating tempera-
- 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.
- 5. Let engine idle for 1 minutes.
- 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).



- Open engine hood.
- 8. Select "HO2S2 (B1) P1146" or "HO2S2 (B2) P1166" of "HO2S2" in "DTC WORK SUPPORT" mode with CONSULT-II.
- 9. Start engine and following the instruction of CONSULT-II.



- 10. Make sure that "OK" is displayed after touching "SELF-DIAG RESULTS".
 - If "NG" is displayed, refer to EC-1101, "Diagnostic Procedure".
 - If "CAN NOT BE DIAGNOSED" is displayed, perform the following.
- a. Turn ignition switch "OFF" and leave the vehicle in a cool place (soak the vehicle).
- b. Return to step 1.

Overall Function Check

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Use this procedure to check the overall function of the heated oxygen sensor 2 circuit. During this check, a DTC might not be confirmed.

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 minutes.
- 5. Set voltmeter probes between ECM terminal 74 [HO2S2 (B1) signal] or 55 [HO2S2 (B2) signal] and engine ground.

DTC P1146, P1166 HO2S2

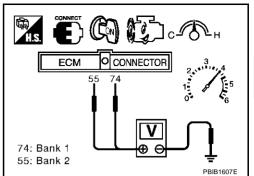
[TYPE 2]

6. Check the voltage when revving up to 4,000 rpm under no load at least 10 times.

(Depress and release accelerator pedal as soon as possible.) The voltage should be below 0.48V at least once during this procedure.

If the voltage can be confirmed in step 6, step 7 is not necessary.

- 7. Keep vehicle at idling for 10 minutes, then check the voltage. Or check the voltage when coasting from 80 km/h (50 MPH) in D position (A/T), 4th gear position (M/T).
 - The voltage should be below 0.48V at least once during this procedure.
- 8. If NG, go to EC-1101, "Diagnostic Procedure".



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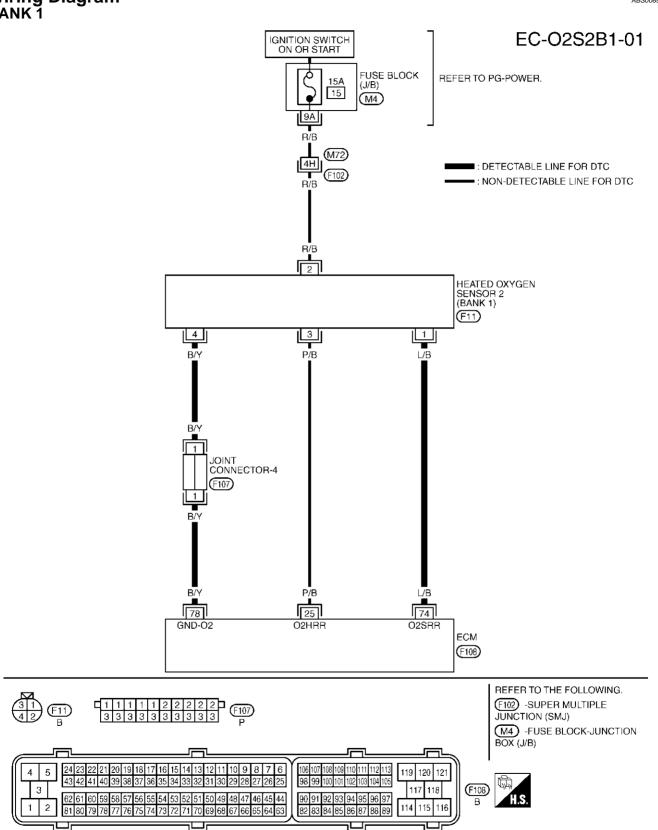
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Wiring Diagram BANK 1

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DTC P1146, P1166 HO2S2

[TYPE 2]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
			[Engine is running] ■ Warm-up condition	
74	L/B	Heated oxygen sensor 2 (bank 1)	 Revving engine from idle to 3,000 rpm quickly after the following conditions are met. 	0 - Approximately 1.0V
			 After 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	[Engine is running]	
78 B/Y	Sensors' ground (Heated oxygen sensor)	Warm-up condition	Approximately 0V	
		Idle speed		

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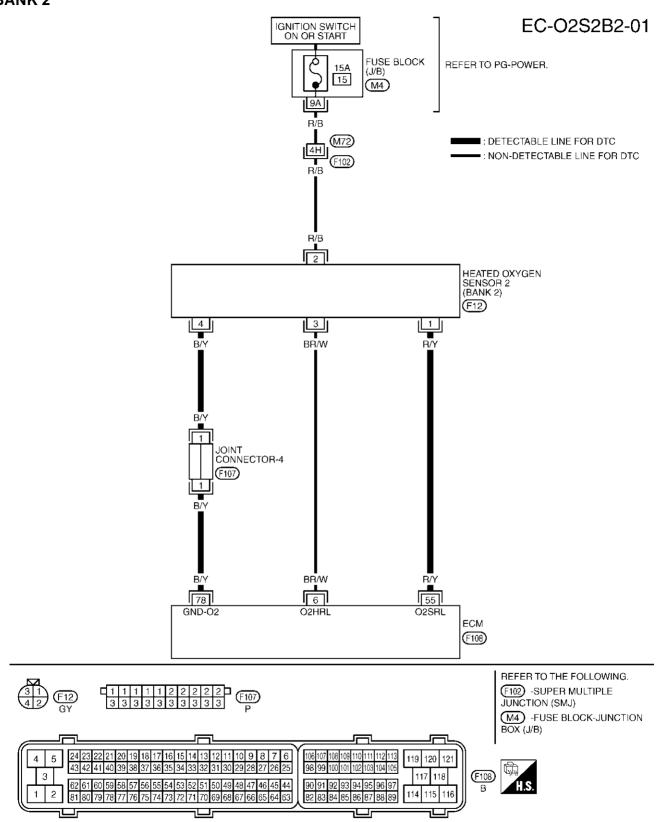
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BANK 2



TBWT0268E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
55	R/Y	Heated oxygen sensor 2 (bank 2)	 [Engine is running] Warm-up condition Revving engine from idle to 3,000 rpm quickly after the following conditions are met. After keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load. 	0 - Approximately 1.0V
78	B/Y	Sensors' ground (Heated oxygen sensor)	[Engine is running]Warm-up conditionIdle speed	Approximately 0V

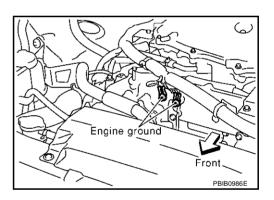
Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

1. Turn ignition switch OFF.

2. Loosen and retighten engine ground screws.

>> GO TO 2.



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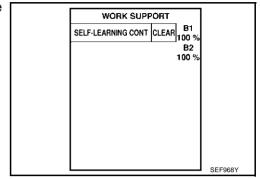
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2. CLEAR THE SELF-LEARNING DATA

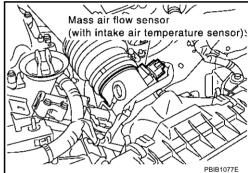
(P) With CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- 2. Select "SELF-LEARNING CONT" in "WORK SUPPORT" mode with CONSULT-II.
- 3. Clear the self-learning control coefficient by touching "CLEAR".
- 4. 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?



W Without CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- 2. Turn ignition switch OFF.
- 3. Disconnect mass air flow sensor harness connector, and restart and run engine for at least 5 seconds at idle speed.
- Stop engine and reconnect mass air flow sensor harness connector.
- 5. Make sure DTC P0102 is displayed.
- Erase the DTC memory. Refer to <u>EC-710, "HOW TO ERASE</u> EMISSION-RELATED DIAGNOSTIC INFORMATION".
- 7. Make sure DTC P0000 is displayed.
- 8. 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?



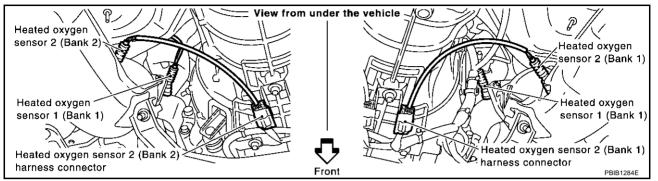
Yes or No

Yes >> Perform trouble diagnosis for DTC P0172, P0175. Refer to <u>EC-914</u>.

No >> GO TO 3.

3. CHECK HO2S2 GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Disconnect heated oxygen sensor 2 harness connector.



 Check harness continuity between HO2S2 terminal 4 and ECM terminal 78. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 5. NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-4
- Harness for open or short between HO2S2 and ECM

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

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5. CHECK HO2S2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

 Check harness continuity between ECM terminal and HO2S2 terminal as follows. Refer to Wiring Diagram.

DTC	Term	Bank	
DIC	ECM	Sensor	Dalik
P1146	74	1	1
P1166	55	1	2

Continuity should exist.

2. Check harness continuity between the following terminals and ground. Refer to Wiring Diagram.

DTC	Tern	Bank	
DIC	ECM	Sensor	Dank
P1146	74	1	1
P1166	55	1	2

Continuity should not exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 6.

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

6. CHECK HEATED OXYGEN SENSOR 2

Refer to EC-1104, "Component Inspection".

OK or NG

OK >> GO TO 7.

NG >> Replace malfunctioning heated oxygen sensor 2.

7. CHECK INTERMITTENT INCIDENT

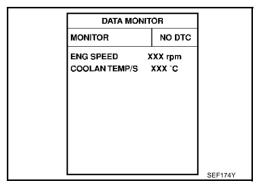
Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

Component Inspection HEATED OXYGEN SENSOR 2

(With CONSULT-II

- 1. Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-II.
- 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.
- 5. Let engine idle for 1 minutes.



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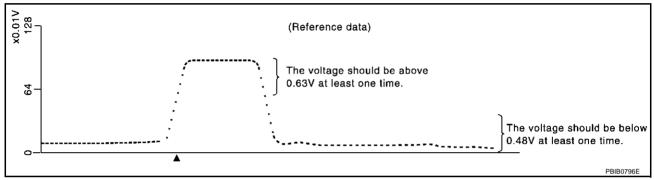
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Select "FUEL INJECTION" in "ACTIVE TEST" mode, and select "HO2S2 (B1)/(B2)" as the monitor item with CONSULT-II.

ACTIVE TES	T	
FUEL INJECTION	25 %	
MONITOR		
ENG SPEED	XXX rpm	
HO2S1 (B1)	XXX V	
HO2S2 (B1)	xxx v	
HO2S1 MNTR (B1)	RICH	
HO2S2 MNTR (B1)	RICH	
		SEF662Y

Check "HO2S2 (B1)/(B2)" at idle speed when adjusting "FUEL INJECTION" to ±25%.



"HO2S2 (B1)/(B2)" should be above 0.63V at least once when the "FUEL INJECTION" is +25%. "HO2S2 (B1)/(B2)" should be below 0.48V at least once when the "FUEL INJECTION" is -25%.

CAUTION:

CAUTION:

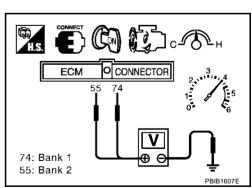
- Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7) in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved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

R Without CONSULT-II

- Start engine and warm it up to the normal operating temperature.
- 2. 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 minutes.
- Set voltmeter probes between ECM terminal 74 [HO2S2 (B1) signal] or 55 [HO2S2 (B2) signal] and engine ground.
- Check the voltage when revving up to 4,000 rpm under no load at least 10 times.
 - (Depress and release accelerator pedal as soon as possible.) The voltage should be above 0.63V at least once during this
 - If the voltage is above 0.63V at step 6, step 7 is not necessary.
- 7. Keep vehicle at idling for 10 minutes, then check voltage. Or check the voltage when coasting from 80 km/h (50 MPH) in D position (A/T), 4th gear position (M/T).
 - The voltage should be below 0.48V at least once during this procedure.

8. If NG, replace heated oxygen sensor 2.

- 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 tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.



DTC P1146, P1166 HO2S2

[TYPE 2]

Removal and Installation HEATED OXYGEN SENSOR 2

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Refer to EM-24, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

DTC P1147, P1167 HO2S2

PFP:226A0

Component Description

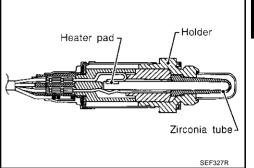
ABSOORGV

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 heated oxygen 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 1V in richer conditions to 0V in leaner conditions.

Under normal conditions the heated oxygen sensor 2 is not used for engine control operation.



CONSULT-II Reference Value in Data Monitor Mode

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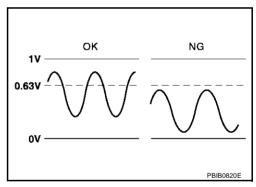
Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
HO2S2 (B1) HO2S2 (B2)	Warm-up condition After keeping engine speed	Revving engine from idle to 3,000 rpm	0 - 0.3V ←→ Approx. 0.6 - 1.0V
HO2S2 MNTR (B1) HO2S2 MNTR (B2)	between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	quickly.	$LEAN \longleftrightarrow RICH$

On Board Diagnosis Logic

ABS0089X

The heated oxygen sensor 2 has a much longer switching time between rich and lean than the heated oxygen sensor 1. The oxygen storage capacity before the three way catalyst 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 the various driving condition such as fuel-cut.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1147 1147 (Bank 1)	Heated oxygen sensor 2 maximum voltage monitoring	The maximum 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
1167 (Bank 2)		Injectors Intake air leaks	

EC-1107 Revision; 2004 April 2003 G35 Sedan

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DTC Confirmation Procedure

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NOTE:

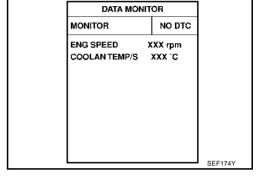
If DTC confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

(P) WITH CONSULT-II

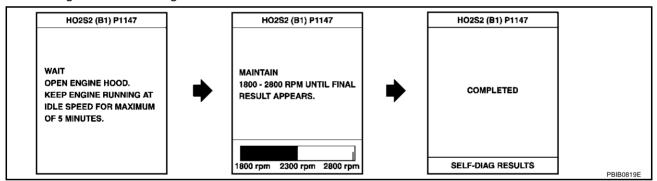
TESTING CONDITION:

For better results, perform "DTC WORK SUPPORT" at a temperature of 0 to 30 °C (32 to 86 °F).

- Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-II.
- 2. Start engine and warm it up to the normal operating tempera-
- 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.
- 5. Let engine idle for 1 minutes.
- 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).



- Open engine hood.
- 8. Select "HO2S2 (B1) P1147" or "HO2S2 (B2) P1167" of "HO2S2" in "DTC WORK SUPPORT" mode with CONSULT-II.
- 9. Start engine and following the instruction of CONSULT-II.



- 10. Make sure that "OK" is displayed after touching "SELF-DIAG RESULTS".
 - If "NG" is displayed, refer to EC-1113, "Diagnostic Procedure".
 - If "CAN NOT BE DIAGNOSED" is displayed, perform the following.
- a. Turn ignition switch "OFF" and leave the vehicle in a cool place (soak the vehicle).
- b. Return to step 1.

Overall Function Check

ABS0089Z

Use this procedure to check the overall function of the heated oxygen sensor 2 circuit. During this check, a DTC might not be confirmed.

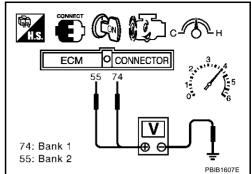
WITH GST

- 1. Start engine and warm it up to the normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 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 minutes.
- 5. Set voltmeter probes between ECM terminal 74 [HO2S2 (B1) signal] or 55 [HO2S2 (B2) signal] and engine ground.

DTC P1147, P1167 HO2S2

[TYPE 2]

- 6. Check the voltage when revving up to 4,000 rpm under no load at least 10 times.
 - (Depress and release accelerator pedal as soon as possible.) The voltage should be above 0.63V at least once during this procedure.
 - If the voltage can be confirmed in step 6, step 7 is not necessary.
- 7. Keep vehicle at idling for 10 minutes, then check the voltage. Or check the voltage when coasting from 80 km/h (50 MPH) in D position (A/T), 4th gear position (M/T).
 - The voltage should be above 0.63V at least once during this procedure.
- 8. If NG, go to EC-1113, "Diagnostic Procedure".



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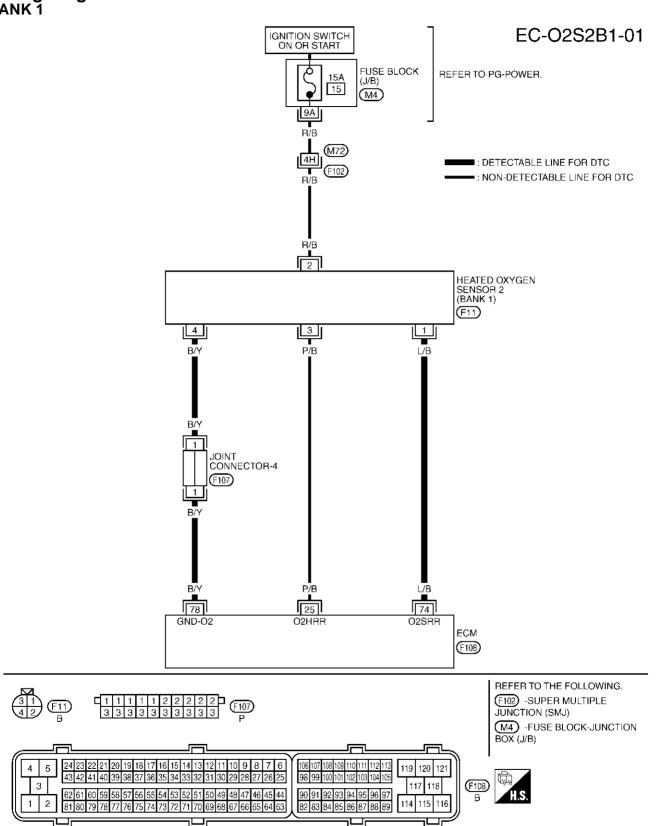
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Wiring Diagram BANK 1

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DTC P1147, P1167 HO2S2

[TYPE 2]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
		Heated oxygen sensor 2 (bank 1)	[Engine is running] • Warm-up condition	
74 L/B	 Revving engine from idle to 3,000 rpm quickly after the following conditions are met. 		0 - Approximately 1.0V	
			 After keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load. 	
78 B/Y		Sensors' ground (Heated oxygen sensor)	[Engine is running]	
	B/Y		Warm-up condition	Approximately 0V
	(Ficated oxygen sensor)	Idle speed		

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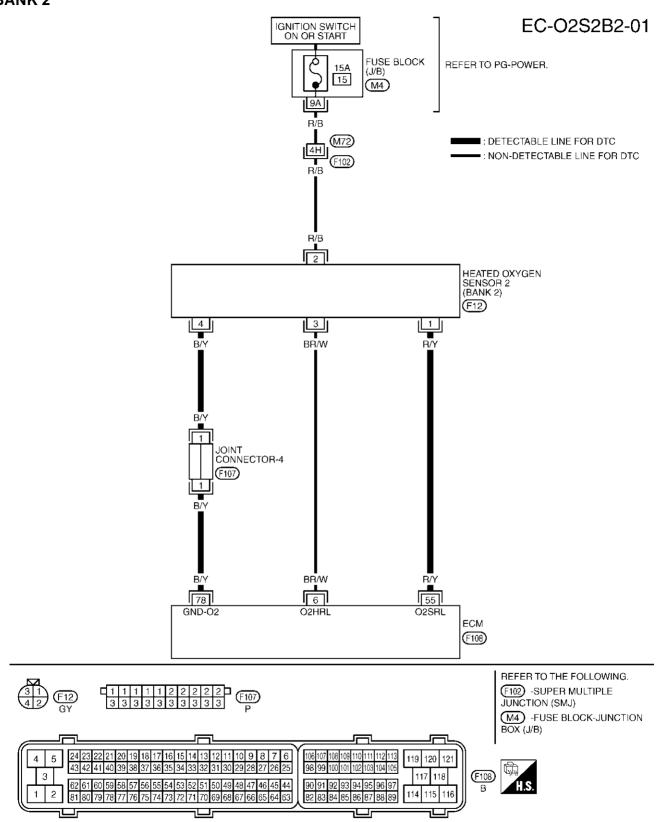
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BANK 2



TBWT0268E

DTC P1147, P1167 HO2S2

[TYPE 2]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
55	R/Y	Heated oxygen sensor 2 (bank 2)	 [Engine is running] Warm-up condition Revving engine from idle to 3,000 rpm quickly after the following conditions are met. After keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load. 	0 - Approximately 1.0V
78	B/Y	Sensors' ground (Heated oxygen sensor)	[Engine is running] • Warm-up condition • Idle speed	Approximately 0V

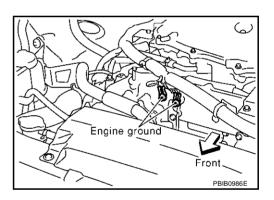
Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

1. Turn ignition switch OFF.

2. Loosen and retighten engine ground screws.

>> GO TO 2.



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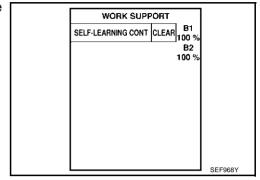
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2. CLEAR THE SELF-LEARNING DATA

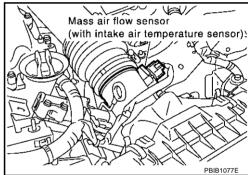
(P) With CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- 2. Select "SELF-LEARNING CONT" in "WORK SUPPORT" mode with CONSULT-II.
- 3. Clear the self-learning control coefficient by touching "CLEAR".
- 4. 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?



W Without CONSULT-II

- 1. Start engine and warm it up to normal operating temperature.
- Turn ignition switch OFF.
- 3. Disconnect mass air flow sensor harness connector, and restart and run engine for at least 5 seconds at idle speed.
- Stop engine and reconnect mass air flow sensor harness connector.
- 5. Make sure DTC P0102 is displayed.
- Erase the DTC memory. Refer to <u>EC-710, "HOW TO ERASE</u> EMISSION-RELATED DIAGNOSTIC INFORMATION".
- 7. Make sure DTC P0000 is displayed.
- 8. 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?



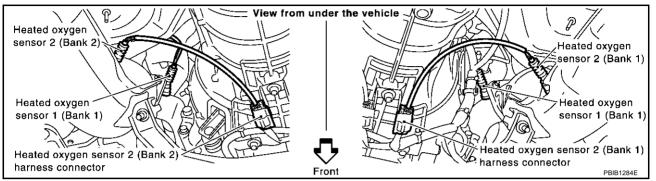
Yes or No

Yes >> Perform trouble diagnosis for DTC P0171or P0174. Refer to <u>EC-905</u>.

No >> GO TO 3.

3. CHECK HO2S2 GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Disconnect heated oxygen sensor 2 harness connector.



 Check harness continuity between HO2S2 terminal 4 and ECM terminal 78. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 5. NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Joint connector-4
- Harness for open or short between HO2S2 and ECM

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

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5. CHECK HO2S2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

 Check harness continuity between ECM terminal and HO2S2 terminal as follows. Refer to Wiring Diagram.

DTC	Term	Bank	
DIC	ECM	Sensor	Dalik
P1147	74	1	1
P1167	55	1	2

Continuity should exist.

2. Check harness continuity between the following terminals and ground. Refer to Wiring Diagram.

DTC	Tern	Bank	
ыс	ECM	Sensor	Dank
P1147	74	1	1
P1167	55	1	2

Continuity should not exist.

Also check harness for short to power.

OK or NG

NG

OK >> GO TO 6.

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

6. CHECK HEATED OXYGEN SENSOR 2

Refer to EC-1116, "Component Inspection".

OK or NG

OK >> GO TO 7.

NG >> Replace malfunctioning heated oxygen sensor 2.

7. CHECK INTERMITTENT INCIDENT

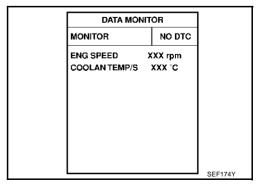
Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

Component Inspection HEATED OXYGEN SENSOR 2

(With CONSULT-II

- 1. Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-II.
- 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 minutes.



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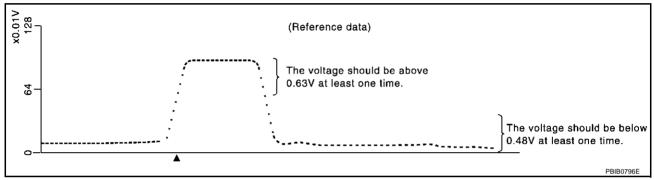
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6. Select "FUEL INJECTION" in "ACTIVE TEST" mode, and select "HO2S2 (B1)/(B2)" as the monitor item with CONSULT-II.

	_	1
ACTIVE TES	Т	
FUEL INJECTION	25 %	
MONITOR		
ENG SPEED	XXX rpm	
HO2S1 (B1)	XXX V	
HO2S2 (B1)	xxx v	
HO2S1 MNTR (B1)	RICH	
HO2S2 MNTR (B1)	RICH	
	· ·	SEF662Y

7. Check "HO2S2 (B1)/(B2)" at idle speed when adjusting "FUEL INJECTION" to $\pm 25\%$.



"HO2S2 (B1)/(B2)" should be above 0.63V at least once when the "FUEL INJECTION" is +25%. "HO2S2 (B1)/(B2)" should be below 0.48V at least once when the "FUEL INJECTION" is -25%.

CAUTION:

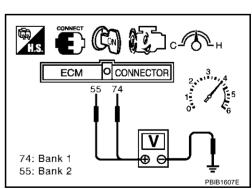
- Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved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

R Without CONSULT-II

- 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 minutes.
- 5. Set voltmeter probes between ECM terminal 74 [HO2S2 (B1) signal] or 55 [HO2S2 (B2) signal] and engine ground.
- 6. Check the voltage when revving up to 4,000 rpm under no load at least 10 times.
 - (Depress and release accelerator pedal as soon as possible.)
 The voltage should be above 0.63V at least once during this
 procedure.
 - If the voltage is above 0.63V at step 6, step 7 is not necessary.
- 7. Keep vehicle at idling for 10 minutes, then check voltage. Or check the voltage when coasting from 80 km/h (50 MPH) in D position (A/T), 4th gear position (M/T).
 - The voltage should be below 0.48V at least once during this procedure.
- 8. If NG, replace 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 tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.



DTC P1147, P1167 HO2S2

[TYPE 2]

Removal and Installation HEATED OXYGEN SENSOR 2

ABS008A3

Refer to EM-24, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

DTC P1148, P1168 CLOSED LOOP CONTROL

[TYPE 2]

DTC P1148, P1168 CLOSED LOOP CONTROL

PFP:22690

On Board Diagnosis Logic

ABS008A4

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These self-diagnoses have the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1148 1148 (Bank 1)	Closed loop control	The closed loop control function for bank 1 does not operate even when vehicle is driving in the specified condition.	The heated oxygen sensor 1 circuit is open or shorted.
P1168 1168 (Bank 2)	function	The closed loop control function for bank 2 does not operate even when vehicle is driving in the specified condition.	Heated oxygen sensor 1 Heated oxygen sensor heater

DTC Confirmation Procedure

ABS00947

Always drive vehicle at a safe speed.

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

- Never raise engine speed above 3,600 rpm during the DTC Confirmation Procedure. If the engine speed limit is exceeded, retry the procedure from step 2.
- Before performing the following procedure, confirm that battery voltage is more than 11V at idle.

(P) WITH CONSULT-II

Start engine and warm it up to normal operating temperature.

- Select "DATA MONITOR" mode with CONSULT-II.
- Hold engine speed at 2,000 rpm and check one of the following.
 - "HO2S1 (B1)/(B2)" voltage should go above 0.70V at least once.
 - "HO2S1 (B1)/(B2)" voltage should go below 0.21V at least

If the check result is NG, perform EC-1120, "Diagnostic Procedure".

If the check result is OK, perform the following step.

- 4. Let engine idle at least 5 minutes.
- Maintain the following condition at least 50 consecutive seconds.

MONITOR NO DTC ENG SPEED XXX rpm COOLAN TEMP/S XXX °C HO2S1 (B1) XXX V HO2S1 (B2) XXX V	DATA MON	ITOR	
COOLAN TEMP/S XXX °C HO2S1 (B1) XXX V	MONITOR	NO DTC	
	COOLANTEMP/S HQ2S1 (B1)	XXX °C	

B/FUEL SCHDL	2.5 msec or more
ENG SPEED	More than 1,500 rpm
Selector lever	Suitable position
VHCL SPEED SE	More than 70 km/h (43 MPH)

During this test, P0132 and/or P0152 may be displayed on CONSULT-II screen.

If DTC is detected, go to EC-1120, "Diagnostic Procedure".

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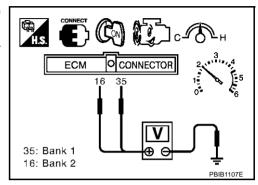
Overall Function Check

A R S O O O A I

Use this procedure to check the overall function of the closed loop control. During this check, a DTC might not be confirmed.

WITH GST

- 1. Start engine and warm it up to normal operating temperature.
- Set voltmeter probes between ECM terminal 35 [HO2S1 (B1) signal] or 16 [HO2S1 (B2) signal] and engine ground.
- 3. Check the following with engine speed held at 2,000 rpm constant under no-load.
 - The voltage should go above 0.70V at least once.
 - The voltage should go below 0.21V at least once.
- 4. If NG, go to EC-1120, "Diagnostic Procedure".



Diagnostic Procedure

ABS0094V

Perform trouble diagnosis for DTC P0133, P0153. Refer to EC-866, "Diagnostic Procedure" .

DTC P1211 TCS CONTROL UNIT

[TYPE 2]

DTC P1211 TCS CONTROL UNIT

PFP:47850

Description

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The malfunction information related to TCS is transferred through the CAN communication line from VDC/TCS/ABS control unit to ECM.

TCS/ABS control unit to ECM.

Be sure to erase the malfunction information such as DTC not only for VDC/TCS/ABS control unit but

On Board Diagnosis Logic

also for ECM after TCS related repair.

AB\$008A9

Freeze frame data is not stored in the ECM for this self-diagnosis. The MIL will not light up for this self-diagnosis.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1211	TCS control unit	ECM receives a malfunction information from	VDC/TCS/ABS control unit
1211		VDC/TCS/ABS control unit.	TCS related parts

DTC Confirmation Procedure

ABS008AA

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10.5V at idle.

(P) WITH CONSULT-II

- 1. Turn ignition switch ON.
- Select "DATA MONITOR" mode with CONSULT-II.
- 3. Start engine and let it idle for at least 60 seconds.
- 4. If 1st trip DTC is detected, go to EC-1121, "Diagnostic Procedure".

DATA M	DATA MONITOR	
MONITOR	NO DTC	
ENG SPEED	XXX rpm	

WITH GST

Follow the procedure "WITH CONSULT-II" above.

Diagnostic Procedure

ABS008AB

Go to BRC-13, "TROUBLE DIAGNOSIS".

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DTC P1212 TCS COMMUNICATION LINE

[TYPE 2]

DTC P1212 TCS COMMUNICATION LINE

PFP:47850

Description

NOTE:

If DTC P1212 is displayed with DTC U1000 or U1001, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-788, "DTC U1000, U1001 CAN COMMUNICATION LINE".

This CAN communication line is used to control the smooth engine operation during the TCS operation. Pulse signals are exchanged between ECM and VDC/TCS/ABS control unit.

Be sure to erase the malfunction information such as DTC not only for VDC/TCS/ABS control unit but also for ECM after TCS related repair.

On Board Diagnosis Logic

ABS008AD

Freeze frame data is not stored in the ECM for this self-diagnosis. The MIL will not light up for this self-diagnosis.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1212 1212	TCS communication line	ECM can not receive the information from VDC/TCS/ABS control unit continuously.	 Harness or connectors (The CAN communication line is open or shorted.) VDC/TCS/ABS control unit Dead (Weak) battery

DTC Confirmation Procedure

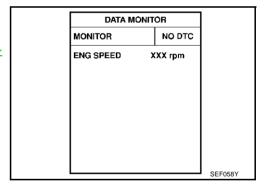
ABS008AE

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10.5V at idle.

(P) WITH CONSULT-II

- 1. Turn ignition switch ON.
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- 3. Start engine and let it idle for at least 10 seconds.
- 4. If a 1st trip DTC is detected, go to <u>EC-1122</u>, "<u>Diagnostic Procedure</u>".



WITH GST

Follow the procedure "WITH CONSULT-II" above.

Diagnostic Procedure

ABS008AF

1. CHECK VDC/TCS/ABS CONTROL UNIT FUNCTION

Refer to BRC-13, "TROUBLE DIAGNOSIS".

>> INSPECTION END

[TYPE 2]

DTC P1217 ENGINE OVER TEMPERATURE (FOR A/T MODELS)

PFP:00000

Description SYSTEM DESCRIPTION

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NOTE:

If DTC P1217 is displayed with DTC U1000 or U1001, first perform the trouble diagnosis for DTC U1000 or U1001. Refer to EC-788, "DTC U1000, U1001 CAN COMMUNICATION LINE".

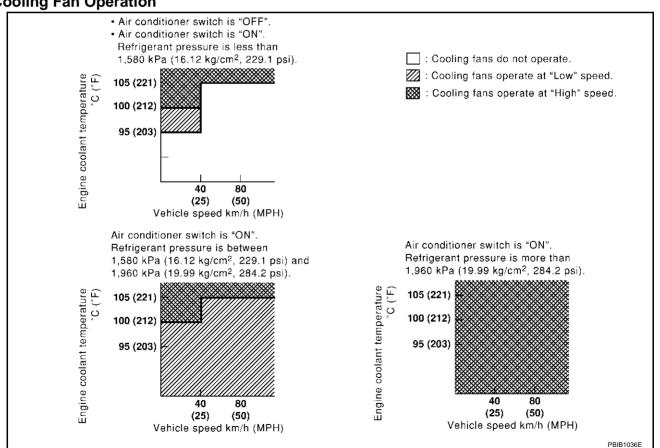
Cooling Fan Control

Sensor Input Signal to ECM		ECM function	Actuator	
Crankshaft position sensor (POS) Camshaft position sensor (PHASE)	Engine speed*1			
Battery	Battery voltage*1			
Wheel sensor	Vehicle speed*2	Cooling fan	IPDM E/R (Cooling fan relays)	
Engine coolant temperature sensor	Engine coolant temperature	CONTROL	(Cooling fair relays)	
Air conditioner switch	Air conditioner ON signal*2			
Refrigerant pressure sensor	Refrigerant pressure			

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

The ECM controls the cooling fan corresponding to the vehicle speed, engine coolant temperature, refrigerant pressure, and air conditioner ON signal. The control system has 3-step control [High/Low/Off].

Cooling Fan Operation



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

[TYPE 2]

Cooling Fan Relay Operation

The ECM controls cooling fan relays in the IPDM E/R through CAN communication line.

Cooling fan speed	Cooling fan relay			
Cooling lan speed	1 2 3			
Stop	OFF	OFF	OFF	
Low	OFF	ON	ON	
High	ON	ON	ON	

COMPONENT DESCRIPTION

Cooling Fan Motor

The cooling fan operates at each speed when the current flows in the cooling fan motor as follows.

Cooling fan speed	Cooling fan motor terminals		
Cooling lan speed	(+)	(-)	
1	1	3 and 4	
Low	2	3 and 4	
High	1 and 2	3 and 4	

CONSULT-II Reference Value in Data Monitor Mode

ABS0094F

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
	• Engine: After warming up, idla	Air conditioner switch: OFF	OFF
AIR COND SIG	Engine: After warming up, idle the engine	Air conditioner switch: ON (Compressor operates.)	ON
		Engine coolant temperature is 94°C (201°F) or less	OFF
COOLING FAN	 Engine: After warming up, idle the engine Air conditioner switch: OFF 	Engine coolant temperature is between 95°C (203°F) and 99°C (210°F)	LOW
		Engine coolant temperature is 100°C (212°F) or more	н

On Board Diagnosis Logic

ABS0094G

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.

This self-diagnosis has the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1217 1217	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.) Cooling fan Radiator hose Radiator Radiator cap Water pump Thermostat Cooling fan (crankshaft driven) For more information, refer to <u>EC-1134</u>. "Main 12 Causes of Overheating".

[TYPE 2]

CAUTION:

When a malfunction is indicated, be sure to replace the coolant. Refer to CO-11, "Changing Engine Oil. Refer to LU-8, "Changing Engine Oil".

- 1. Fill radiator with coolant up to specified level with a filling speed of 2 liters per minute. Be sure to use coolant with the proper mixture ratio. Refer to MA-12, "Anti-Freeze Coolant Mixture Ratio".
- 2. After refilling coolant, run engine to ensure that no water-flow noise is emitted.

Overall Function Check

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Use this procedure to check the overall function of the cooling fan. During this check, a DTC might not be confirmed.

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.

(P) WITH CONSULT-II

- Check the coolant level in the reservoir tank and radiator.
 Allow engine to cool before checking coolant level.
 If the coolant level in the reservoir tank and/or radiator is below the proper range, skip the following steps and go to EC-1128, <a href="Diagnostic Procedure".
- 2. Confirm whether customer filled the coolant or not. If customer filled the coolant, skip the following steps and go to EC-1128, "Diagnostic Procedure".
- 3. Start engine.

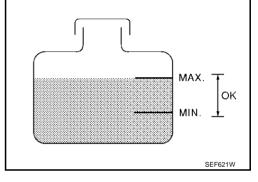
Be careful not to overheat engine.

 Make sure that cooling fan (crankshaft driven) operates normally.

If NG, refer to CO-22, "COOLING FAN".

If OK, go to the following step.

- Stop engine and turn ignition switch ON.
- 6. Select "COOLING FAN" in "ACTIVE TEST" mode with CONSULT-II and touch "LOW" on the CONSULT-II screen.
- 7. Make sure that cooling fan operates at low speed. If NG, go to <u>EC-1132</u>, <u>"PROCEDURE A"</u>. If OK, go to the following step.



ACTIVE TES	Т	
COOLING FAN	LOW	
MONITOR		
COOLANTEMP/S	XXX °C	
		SEF784Z

- 8. Touch "HIGH" on the CONSULT-II screen.
- Make sure that cooling fan operates at higher speed than low speed.

If NG, go to EC-1133, "PROCEDURE B".

If OK, go to the following step.

- Turn ignition switch OFF.
- Check cooling fan motor ground circuit.
 Refer to procedure 4 in <u>EC-1128</u>, "<u>Diagnostic Procedure</u>".
 If NG, follow the construction of procedure 4 in <u>EC-1128</u>, "<u>Diagnostic Procedure</u>".

ACTIVE TES	Т	
COOLING FAN	HIGH	
MONITOR		
COOLANTEMP/S	xxx °c	
		SEF785Z

[TYPE 2]

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- Check the coolant level in the reservoir tank and radiator.
 Allow engine to cool before checking coolant level.
 If the coolant level in the reservoir tank and/or radiator is below the proper range, skip the following steps and go to EC-1128.
 "Diagnostic Procedure"
- 2. Confirm whether customer filled the coolant or not. If customer filled the coolant, skip the following steps and go to EC-1128, "Diagnostic Procedure".
- 3. Start engine.

Be careful not to overheat engine.

4. Make sure that cooling fan (crankshaft driven) operates normally.

If NG, refer to CO-22, "COOLING FAN".

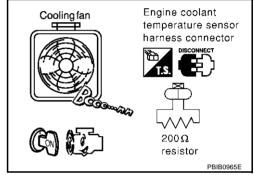
If OK, go to the following step.

- 5. Turn ignition switch OFF.
- 6. Disconnect engine coolant temperature sensor harness connector.
- 7. Connect 200Ω resister to the engine coolant temperature sensor harness connector.
- Start engine and make sure that cooling fan operates at low speed.

If NG, go to EC-1132, "PROCEDURE A".

If OK, go to the following step.

- 9. Turn ignition switch OFF.
- 10. Disconnect 200Ω resister from engine coolant temperature sensor harness connector.

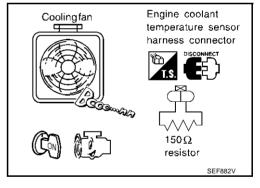


- 11. Connect 150 Ω resister to engine coolant temperature sensor harness connector.
- 12. Restart engine and make sure that cooling fan operates at higher speed than low speed.

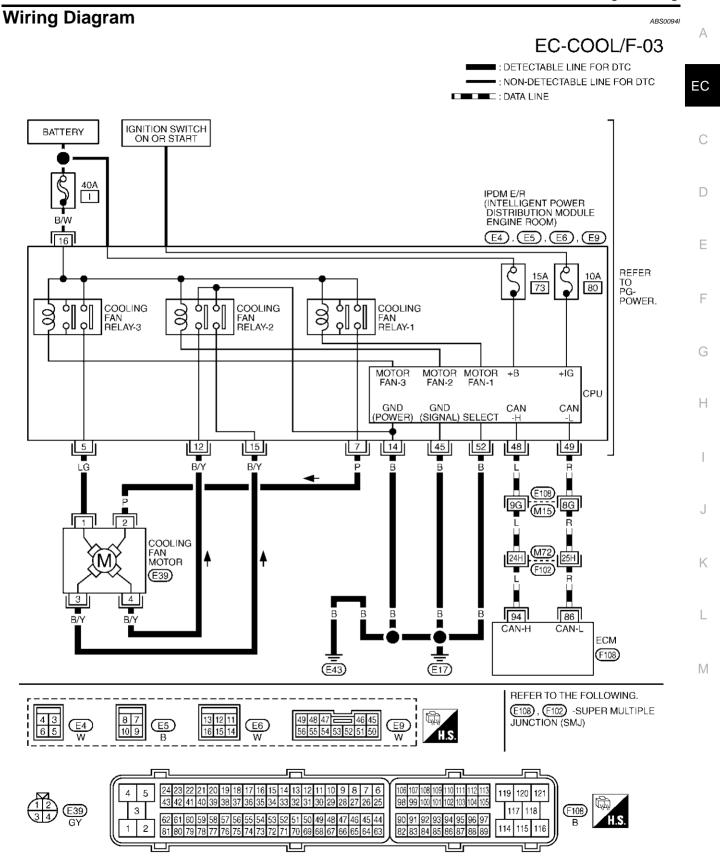
If NG, go to EC-1133, "PROCEDURE B".

If OK, go to the following step.

- 13. Turn ignition switch OFF.
- 14. Check cooling fan motor ground circuit. Refer to procedure 7 in <u>EC-1128</u>, "<u>Diagnostic Procedure</u>". If NG, follow the construction of procedure 7 in <u>EC-1128</u>, "<u>Diagnostic Procedure</u>".



[TYPE 2]



TBWT0456E

[TYPE 2]

Diagnostic Procedure

1. CHECK COOLING FAN (CRANKSHAFT DRIVEN)

ABS0094J

- Start engine and let it idle.
- 2. Make sure that cooling fan (crankshaft driven) operates normally.

OK or NG

OK (With CONSULT-II)>>GO TO 2.

OK (without CONSULT-II)>>GO TO 5.

>> Check cooling fan (crankshaft driven). Refer to CO-22, "COOLING FAN".

2. CHECK COOLING FAN LOW SPEED OPERATION

(III) With CONSULT-II

- Turn ignition switch ON.
- Select "COOLING FAN" in "ACTIVE TEST" mode with CON-SULT-II and touch "LOW" on the CONSULT-II screen.
- 3. Make sure that cooling fan operates at low speed.

OK or NG

OK >> GO TO 3.

NG >> Check cooling fan low speed control circuit. (Go to EC-1132, "PROCEDURE A" .)

ACTIVE TES	ST.	
COOLING FAN	LOW	
MONITOR	1	
COOLAN TEMP/S	XXX °C	
		SEF784Z

3. CHECK COOLING FAN HIGH SPEED OPERATION

With CONSULT-II

- Touch "HIGH" on the CONSULT-II screen.
- Make sure that cooling fan operates at higher speed than low speed.

OK or NG

OK >> GO TO 4.

NG

>> Check cooling fan high speed control circuit. (Go to EC-1133, "PROCEDURE B".)

ACTIVE TES		
COOLING FAN	HIGH	
MONITOR		
COOLAN TEMP/S	XXX °C	
		SEF785Z

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4. CHECK COOLING FAN MOTOR GROUND CIRCUIT FOR OPEN AND SHORT-I

(II) With CONSULT-II

- Turn ignition switch OFF.
- 2. Disconnect cooling fan motor harness connector.
- Turn ignition switch ON.
- Select "COOLING FAN" in "ACTIVE TEST" mode with CON-SULT-II and touch "LOW" on the CONSULT-II screen.
- Check harness continuity between cooling fan motor terminals 3, 4 and IPDM E/R terminal 14. Refer to Wiring Diagram.

Continuity should exist.

6. Also check harness for short to power.

OK or NG

OK >> GO TO 9. NG >> GO TO 8.

ACTIVE TES	т	
COOLING FAN	LOW	
MONITOR		
COOLANTEMP/S	XXX °C	
		SEF784Z

5. CHECK COOLING FAN LOW SPEED OPERATION

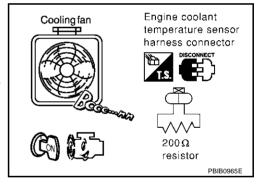
Without CONSULT-II

- Turn ignition switch OFF.
- Disconnect engine coolant temperature sensor harness connector.
- Connect 200Ω resistor to the engine coolant temperature sensor harness connector.
- Start engine and make sure that cooling fan operates at low speed.

OK or NG

OK >> GO TO 6.

NG >> Check cooling fan low speed control circuit. (Go to EC-1132, "PROCEDURE A".)



6. CHECK COOLING FAN HIGH SPEED OPERATION

Without CONSULT-II

- Turn ignition switch OFF.
- 2. Disconnect 200 Ω resistor from engine coolant temperature sensor harness connector.
- Connect 150 Ω resistor to engine coolant temperature sensor harness connector.
- Restart engine and make sure that cooling fan operates at higher speed than low speed.

OK or NG

OK >> GO TO 7.

>> Check cooling fan high speed control circuit. (Go to EC-NG 1133, "PROCEDURE B" .)

Engine coolant Coolingfan temperature sensor harness connector 150Ω resistor SEF882V

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[TYPE 2]

$7.\,$ check cooling fan motor ground circuit for open and short-i

Without CONSULT-II

- 1. Turn ignition switch OFF.
- 2. Disconnect cooling fan motor harness connector.
- Disconnect engine coolant temperature sensor harness connector.
- 4. Connect 150Ω resistor to the engine coolant temperature sensor harness connector.
- 5. Turn ignition switch ON.
- 6. Check harness continuity between cooling fan motor terminals 3,4 and IPDM E/R terminal 14. Refer to Wiring Diagram.

Continuity should exist.

7. Also check harness for short to power.

OK or NG

OK >> GO TO 9. NG >> GO TO 8.

8. CHECK COOLING FAN MOTOR GROUND CIRCUIT FOR OPEN AND SHORT-II

- 1. Turn ignition switch OFF.
- Disconnect IPDM E/R harness connector E6.
- Check harness continuity between the following; cooling fan motor terminal 3 and IPDM E/R terminal 15 cooling fan motor terminal 4 and IPDM E/R terminal 12. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to power.

OK or NG

OK >> Replace IPDM E/R.

NG >> Repair open circuit or short to power in harness or connector.

9. CHECK COOLING SYSTEM FOR LEAK

Apply pressure to the cooling system with a tester, and check if the pressure drops.

Testing pressure: 157 kPa (1.6 kg/cm², 23 psi)

CAUTION:

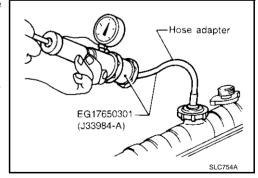
Higher than the specified pressure may cause radiator damage. Pressure should not drop.

OK or NG

OK >> GO TO 10.

NG >> Check the following for leak

- Hose
- Radiator
- Water pump Refer to <u>CO-26, "WATER PUMP"</u>.



[TYPE 2]

10. CHECK RADIATOR CAP

Apply pressure to cap with a tester.

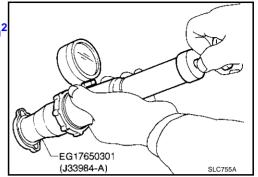
Radiator cap relief pressure: 59 - 98 kPa (0.6 - 1.0 kg/cm²

, 9 - 14 psi)

OK or NG

OK >> GO TO 11.

NG >> Replace radiator cap.



11. CHECK THERMOSTAT

1. Check valve seating condition at normal room temperatures. **It should seat tightly.**

Check valve opening temperature and valve lift.

Valve opening temperature: 82°C (180°F) [standard]
Valve lift: More than 8.6 mm/95°C

(0.339 in/203°F)

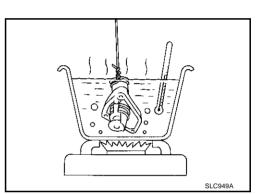
3. Check if valve is closed at 5°C (9°F) below valve opening temperature.

For details, refer to CO-30, "THERMOSTAT AND THERMOSTAT HOUSING".



OK >> GO TO 12.

NG >> Replace thermostat.



12. CHECK ENGINE COOLANT TEMPERATURE SENSOR

Refer to EC-834, "Component Inspection".

OK or NG

OK >> GO TO 13.

NG >> Replace engine coolant temperature sensor.

13. CHECK MAIN 12 CAUSES

If the cause cannot be isolated, go to EC-1134, "Main 12 Causes of Overheating".

>> INSPECTION END

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PROCEDURE A

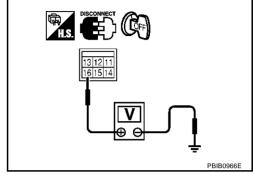
1. CHECK POWER SUPPLY CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect IPDM E/R harness connectors E6.
- Check voltage between IPDM E/R terminal 16 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 3. NG >> GO TO 2.



2. DETECT MALFUNCTIONING PART

Check the following.

- 40A fusible link
- Harness for open or short between IPDM E/R and battery
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK COOLING FAN MOTOR CIRCUIT

- 1. Disconnect cooling fan motor harness connector.
- Check harness continuity between the following; cooling fan motor terminal 1 and IPDM E/R terminal 5, cooling fan motor terminal 3 and IPDM E/R terminal 15, cooling fan motor terminal 4 and IPDM E/R terminal 12, IPDM E/R terminal 14 and engine ground. Refer to wiring diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 4.

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

4. CHECK COOLING FAN MOTOR

Refer to EC-1134, "COOLING FAN MOTOR".

OK or NG

OK >> GO TO 5.

NG >> Replace cooling fan motor.

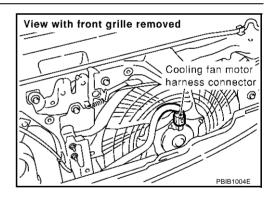
5. CHECK INTERMITTENT INCIDENT

Perform EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

OK or NG

OK >> Replace IPDM E/R. Refer to PG-16, "IPDM E/R (INTELLIGENT POWER DISTRIBUTION MOD-ULE ENGINE ROOM)" .

NG >> Repair or replace harness or connector.



[TYPE 2]

PROCEDURE B

1. CHECK COOLING FAN MOTOR CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect cooling fan motor harness connector.
- Check harness continuity between the following; cooling fan motor terminal 2 and IPDM E/R terminal 7, cooling fan motor terminal 3 and IPDM E/R terminal 15, cooling fan motor terminal 4 and IPDM E/R terminal 12. Refer to wiring diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 2.

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

2. CHECK COOLING FAN MOTOR

Refer to EC-1134, "COOLING FAN MOTOR".

OK or NG

OK >> GO TO 3.

NG >> Replace cooling fan motor.

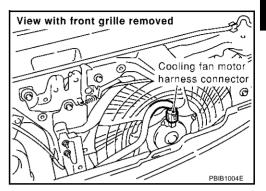
3. CHECK INTERMITTENT INCIDENT

Perform EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

OK or NG

OK >> Replace IPDM E/R. Refer to <u>PG-16</u>, "IPDM E/R (INTELLIGENT POWER DISTRIBUTION MOD-<u>ULE ENGINE ROOM)"</u>.

NG >> Repair or replace harness connectors.



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[TYPE 2]

Main 12 Causes of Overheating

ABS0094K

Engine	Step	Inspection item	Equipment	Standard	Reference page
OFF	1	Blocked radiator	Visual	No blocking	_
		 Blocked condenser 			
		 Blocked radiator grille 			
		 Blocked bumper 			
	2	Coolant mixture	Coolant tester	50 - 50% coolant mixture	MA-12
	3	Coolant level	Visual	Coolant up to MAX level in reservoir tank and radiator filler neck	CO-11
	4	Radiator cap	Pressure tester	59 - 98 kPa	<u>CO-17</u>
				(0.6 - 1.0 kg/cm ² , 9 - 14 psi) (Limit)	
ON*2	5	Coolant leaks	Visual	No leaks	<u>CO-11</u>
ON* ²	6	Thermostat	Touch the upper and lower radiator hoses	Both hoses should be hot	CO-30
ON* ¹	7	Cooling fan	CONSULT-II	Operating	See trouble diagnosis for DTC P1217 (EC-1123).
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	<u>CO-11</u>
OFF*4	10	Coolant return from reservoir tank to radia- tor	Visual	Should be initial level in reservoir tank	<u>CO-11</u>
OFF	11	Cylinder head	Straight gauge feeler gauge	0.1 mm (0.004 in) Maximum distortion (warping)	<u>EM-89</u>
	12	Cylinder block and pistons	Visual	No scuffing on cylinder walls or piston	EM-103

^{*1:} Turn the ignition switch ON.

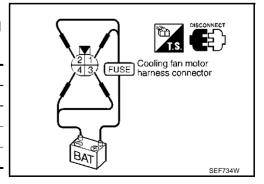
For more information, refer to CO-7, "OVERHEATING CAUSE ANALYSIS" .

Component Inspection COOLING FAN MOTOR

ABS0094L

- 1. Disconnect cooling fan motor harness connectors.
- 2. Supply cooling fan motor terminals with battery voltage and check operation.

	Speed	terminals	
	Opeeu	(+)	(-)
	Low	1	3 and 4
Cooling fan motor		2	3 and 4
	High	1 and 2	3 and 4



Cooling fan motor should operate.

If NG, replace cooling fan motor.

^{*2:} Engine running at 3,000 rpm for 10 minutes.

^{*3:} Drive at 90 km/h (55 MPH) for 30 minutes and then let idle for 10 minutes.

^{*4:} After 60 minutes of cool down time.

[TYPE 2]

DTC P1217 ENGINE OVER TEMPERATURE (FOR M/T MODELS)

PFP:00000

Description SYSTEM DESCRIPTION

ABS008AG

NOTE:

If DTC P1217 is displayed with DTC U1000 or U1001, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-788, "DTC U1000, U1001 CAN COMMUNICATION LINE".

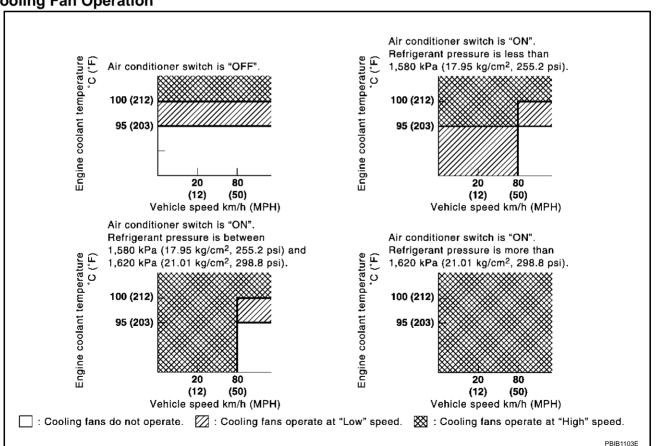
Cooling Fan Control

Sensor	Input Signal to ECM	ECM function	Actuator
Crankshaft position sensor (POS) Camshaft position sensor (PHASE)	Engine speed*1		
Battery	Battery voltage*1		
Wheel sensor	Vehicle speed*2	Cooling fan	IPDM E/R (Cooling fan relays)
Engine coolant temperature sensor	Engine coolant temperature	Control	(Cooming fair relays)
Air conditioner switch	Air conditioner ON signal*2		
Refrigerant pressure sensor	Refrigerant pressure		

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

The ECM controls the cooling fan corresponding to the vehicle speed, engine coolant temperature, refrigerant pressure, and air conditioner ON signal. The control system has 3-step control [HIGH/LOW/OFF].

Cooling Fan Operation



EC-1135 Revision; 2004 April 2003 G35 Sedan

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

[TYPE 2]

Cooling Fan Relay Operation

The ECM controls cooling fan relays in the IPDM E/R through CAN communication line.

Cooling fan speed	Cooling fan relay		
Cooling fair speed	1	2	3
Stop	OFF	OFF	OFF
Low	ON	OFF	OFF
High	ON	ON	ON

COMPONENT DESCRIPTION

Cooling Fan Motor

The cooling fan operates at each speed when the current flows in the cooling fan motor as follows.

Cooling fan speed	Cooling fan motor terminals		
Cooling lan speed	(+)	(-)	
Low	1	3	
LOW	2	4	
High	1 and 2	3 and 4	

CONSULT-II Reference Value in Data Monitor Mode

ABS008AH

Specification data are reference values.

MONITOR ITEM	CO	SPECIFICATION	
	• Engine: After warming up, idla	Air conditioner switch: OFF	OFF
AIR COND SIG	 Engine: After warming up, idle the engine 	Air conditioner switch: ON (Compressor operates.)	ON
	 Engine: After warming up, idle the engine Air conditioner switch: OFF 	Engine coolant temperature is 94°C (201°F) or less	OFF
COOLING FAN		Engine coolant temperature is between 95°C (203°F) and 99°C (210°F)	LOW
		Engine coolant temperature is 100°C (212°F) or more	н

On Board Diagnosis Logic

ABS008AI

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.

This self-diagnosis has the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1217 1217	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.) Cooling fan Radiator hose Radiator Radiator cap Water pump Thermostat For more information, refer to <u>EC-1146</u>. "Main 12 Causes of Overheating"

[TYPE 2]

CAUTION:

When a malfunction is indicated, be sure to replace the coolant. Refer to CO-11, "Changing Engine Oil. Refer to LU-8, "Changing Engine Oil".

- 1. Fill radiator with coolant up to specified level with a filling speed of 2 liters per minute. Be sure to use coolant with the proper mixture ratio. Refer to MA-12, "Anti-Freeze Coolant Mixture Ratio".
- 2. After refilling coolant, run engine to ensure that no water-flow noise is emitted.

Overall Function Check

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Use this procedure to check the overall function of the cooling fan. During this check, a DTC might not be confirmed.

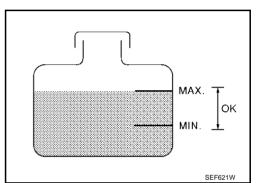
WARNING:

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.

(P) WITH CONSULT-II

- Check the coolant level in the reservoir tank and radiator.
 Allow engine to cool before checking coolant level.
 If the coolant level in the reservoir tank and/or radiator is below the proper range, skip the following steps and go to <u>EC-1141</u>, "Diagnostic Procedure".
- 2. Confirm whether customer filled the coolant or not. If customer filled the coolant, skip the following steps and go to EC-1141, "Diagnostic Procedure".
- Turn ignition switch ON.



- 4. Perform "COOLING FAN" in "ACTIVE TEST" mode with CONSULT-II.
- 5. If the results are NG, go to EC-1141, "Diagnostic Procedure".

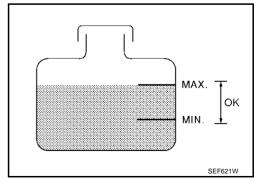
		1
ACTIVE TES	T	
COOLING FAN	OFF	
MONITOR		
COOLAN TEMP/S	XXX ,C	
		SEF646X

® WITH GST

- Check the coolant level in the reservoir tank and radiator.
 Allow engine to cool before checking coolant level.
 If the coolant level in the reservoir tank and/or radiator is below the proper range, skip the following steps and go to <u>EC-1141</u>, "Diagnostic Procedure".
- Confirm whether customer filled the coolant or not. If customer filled the coolant, skip the following steps and go to <u>EC-1141</u>, <u>"Diagnostic Procedure"</u>.
- 3. Start engine.

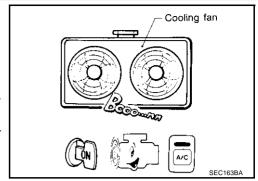
Be careful not to overheat engine.

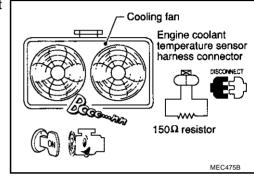
- 4. Turn air conditioner switch ON.
- 5. Turn blower fan switch ON.



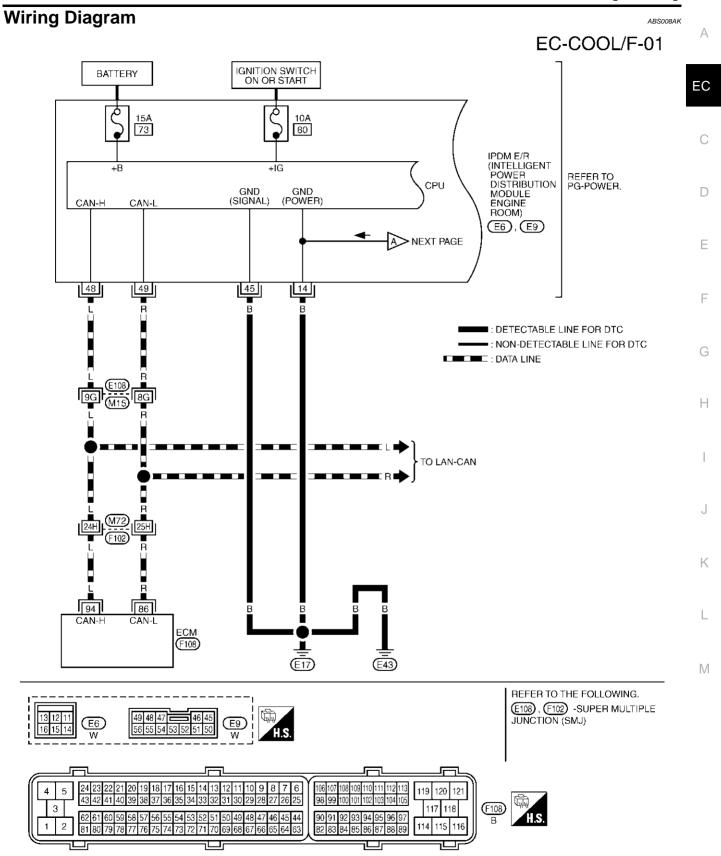
[TYPE 2]

- Make sure that cooling fan operates at low speed.
 If NG, go to <u>EC-1141</u>, "<u>Diagnostic Procedure</u>".
 If OK, go to the following step.
- Turn ignition switch OFF.
- 8. Turn air conditioner switch and blower fan switch OFF.
- Disconnect engine coolant temperature sensor harness connector
- 10. Connect 150Ω resistor to engine coolant temperature sensor harness connector.
- Restart engine and make sure that cooling fan operates at higher speed than low speed.
 Be careful not to overheat engine.
- 12. If NG, go to EC-1141, "Diagnostic Procedure" .

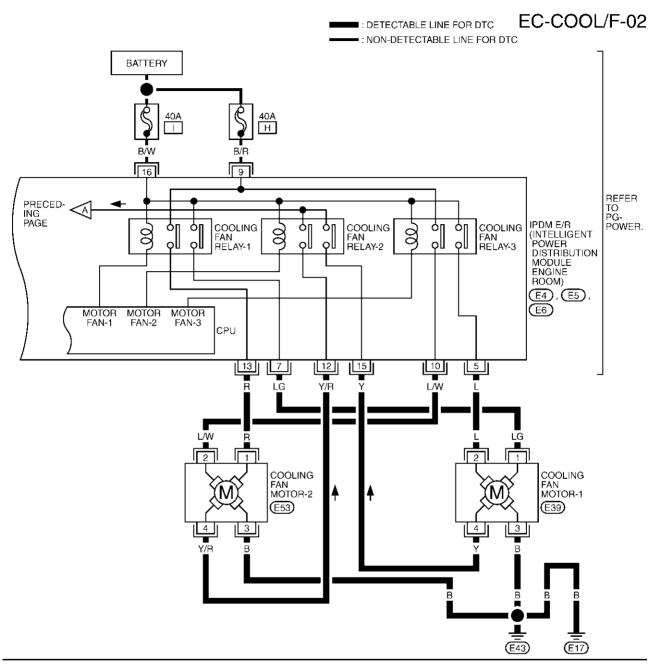


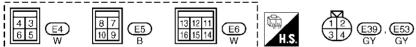


[TYPE 2]



TBWT0428E





TBWT0291E

[TYPE 2]

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Diagnostic Procedure

1. INSPECTION START

Do vou have CONSULT-II?

Yes or No

Yes >> GO TO 2.

Nο >> GO TO 4.

2. CHECK COOLING FAN LOW SPEED OPERATION

With CONSULT-II

- Start engine and let it idle.
- Select "COOLING FAN" in "ACTIVE TEST" mode with CON-SULT-II and touch "LOW" on the CONSULT-II screen.
- 3. Make sure that cooling fans-1 and -2 operate at low speed.

OK or NG

OK >> GO TO 3.

NG >> Check cooling fan low speed control circuit. (Go to EC-1144, "PROCEDURE A" .)

ACTIVE TES	Т
COOLING FAN	LOW
MONITOR	
COOLAN TEMP/S	XXX °C
	<u> </u>

$oldsymbol{3}$. Check cooling fan high speed operation

(II) With CONSULT-II

- Touch "HIGH" on the CONSULT-II screen.
- Make sure that cooling fans-1 and -2 operate at higher speed than low speed.

OK or NG

OK >> GO TO 6.

NG >> Check cooling fan high speed control circuit. (Go to EC-1145, "PROCEDURE B".)

ACTIVE TE	ACTIVE TEST	
COOLING FAN	HIGH	
MONITOR	₹	
COOLANTEMP/S	XXX °C	
	+	

4. CHECK COOLING FAN LOW SPEED OPERATION

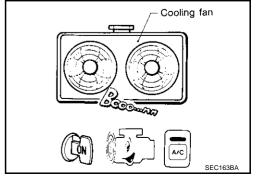
® Without CONSULT-II

- Start engine and let it idle.
- Turn air conditioner switch ON.
- Turn blower fan switch ON.
- 4. Make sure that cooling fans-1 and -2 operate at low speed.

OK or NG

OK >> GO TO 5.

NG >> Check cooling fan low speed control circuit. (Go to EC-1144, "PROCEDURE A".)



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5. CHECK COOLING FAN HIGH SPEED OPERATION

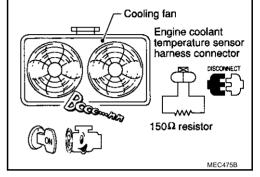
® Without CONSULT-II

- 1. Turn ignition switch OFF.
- 2. Turn air conditioner switch and blower fan switch OFF.
- Disconnect engine coolant temperature sensor harness connector.
- 4. Connect 150Ω resistor to engine coolant temperature sensor harness connector.
- 5. Restart engine and make sure that cooling fans-1 and -2 operate at higher speed than low speed.

OK or NG

OK >> GO TO 6.

NG >> Check cooling fan high speed control circuit. (Go to <u>EC-</u>1145, "PROCEDURE B" .)



6. CHECK COOLING SYSTEM FOR LEAK

Apply pressure to the cooling system with a tester, and check if the pressure drops.

Testing pressure: 157 kPa (1.6 kg/cm², 23 psi)

CAUTION.

Higher than the specified pressure may cause radiator damage. Pressure should not drop.

OK or NG

OK

>> GO TO 7.

NG

- >> Check the following for leak. Refer to <u>CO-11, "LEAK CHECK"</u> .
 - Hose
 - Radiator
 - Water pump

7. CHECK RADIATOR CAP

Apply pressure to cap with a tester.

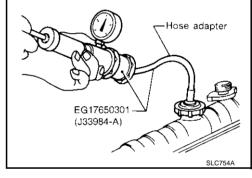
Radiator cap relief pressure: 59 - 98 kPa (0.6 - 1.0 kg/cm²

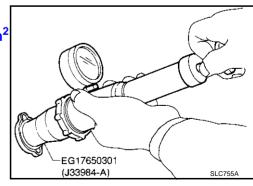
, 9 - 14 psi)

OK or NG

OK >> GO TO 8.

NG >> Replace radiator cap.





[TYPE 2]

8. CHECK THERMOSTAT

1. Check valve seating condition at normal room temperatures. **It should seat tightly.**

Check valve opening temperature and valve lift.

Valve opening temperature: 76.5°C (170°F) [standard]
Valve lift: More than 8.6 mm/90°C (0.339 in/194°F)

3. Check if valve is closed at 5°C (9°F) below valve opening temperature.

For details, refer to CO-30, "THERMOSTAT AND THERMOSTAT HOUSING".



OK >> GO TO 9.

NG >> Replace thermostat

9. CHECK ENGINE COOLANT TEMPERATURE SENSOR

Refer to EC-834, "Component Inspection".

OK or NG

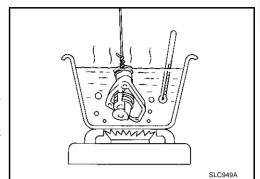
OK >> GO TO 10.

NG >> Replace engine coolant temperature sensor.

10. CHECK MAIN 12 CAUSES

If the cause cannot be isolated, go to EC-1146, "Main 12 Causes of Overheating".

>> INSPECTION END



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PROCEDURE A

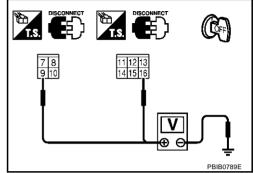
1. CHECK POWER SUPPLY CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect IPDM E/R harness connectors E5 and E6.
- Check voltage between IPDM E/R terminals 9, 16 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 3. NG >> GO TO 2.



2. DETECT MALFUNCTIONING PART

Check the following.

- 40A fusible links
- Harness for open or short between IPDM E/R and battery
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK COOLING FAN MOTORS CIRCUIT

- Disconnect cooling fan motor-1 harness connector and cooling fan motor-2 harness connector.
- Check harness continuity between cooling fan motor-1 terminal 1 and IPDM E/R terminal 7, cooling fan motor-1 terminal 3 and ground.

Refer to wiring diagram.

Continuity should exist.

- Also check harness for short to ground and short to power.
- Check harness continuity between cooling fan motor-2 terminal 1 and IPDM E/R terminal 13, cooling fan motor-2 terminal 3 and ground.

Refer to wiring diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 4

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

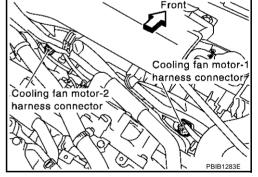
4. CHECK COOLING FAN MOTORS

Refer to EC-1146, "Component Inspection".

OK or NG

OK >> GO TO 5.

NG >> Replace cooling fan motors.



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5. CHECK INTERMITTENT INCIDENT

Perform EC-780. "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

OK or NG

>> Replace IPDM E/R. Refer to PG-16, "IPDM E/R (INTELLIGENT POWER DISTRIBUTION MOD-OK **ULE ENGINE ROOM)**".

NG >> Repair or replace harness or connector.

PROCEDURE B

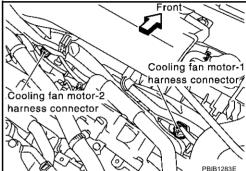
CHECK COOLING FAN MOTORS CIRCUIT

- Turn ignition switch OFF.
- Disconnect cooling fan motor-1 harness connector and cooling fan motor-2 harness connector.
- Check harness continuity between the following; cooling fan motor-1 terminal 2 and IPDM E/R terminal 5, cooling fan motor-1 terminal 4 and IPDM E/R terminal 15, IPDM E/R terminal 14 and ground, IPDM E/R terminal 45 and ground. Refer to wiring diagram.

Continuity should exist.

- Also check harness for short to ground and short to power.
- Check harness continuity between the following: cooling fan motor-2 terminal 2 and IPDM E/R terminal 10. cooling fan motor-2 terminal 4 and IPDM E/R terminal 12, IPDM E/R terminal 14 and ground, IPDM E/R terminal 45 and ground. Refer to wiring diagram.





Continuity should exist.

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

OK or NG

OK >> GO TO 2.

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

2. CHECK COOLING FAN MOTORS

Refer to EC-1146, "Component Inspection".

OK or NG

OK >> GO TO 3.

NG >> Replace cooling fan motors.

3. CHECK INTERMITTENT INCIDENT

Perform EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

OK or NG

>> Replace IPDM E/R. Refer to PG-16, "IPDM E/R (INTELLIGENT POWER DISTRIBUTION MOD-OK ULE ENGINE ROOM)".

NG >> Repair or replace harness connectors.

EC-1145 Revision; 2004 April 2003 G35 Sedan

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[TYPE 2]

Main 12 Causes of Overheating

ABS008AM

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	50 - 50% coolant mixture	MA-12
	3	Coolant level	Visual	Coolant up to MAX level in reservoir tank and radiator filler neck	CO-11
	4	Radiator cap	Pressure tester	59 - 98 kPa (0.6 - 1.0 kg/cm ² , 9 - 14 psi) (Limit)	CO-17
ON*2	5	Coolant leaks	Visual	No leaks	<u>CO-11</u>
ON* ²	6	Thermostat	Touch the upper and lower radiator hoses	Both hoses should be hot	CO-30
ON* ¹	7	Cooling fan	CONSULT-II	Operating	See trouble diagnosis for DTC P1217 (EC-1135).
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	<u>CO-11</u>
OFF* ⁴	10	Coolant return from reservoir tank to radia- tor	Visual	Should be initial level in reservoir tank	<u>CO-11</u>
OFF	11	Cylinder head	Straight gauge feeler gauge	0.1 mm (0.004 in) Maximum distortion (warping)	EM-89
	12	Cylinder block and pistons	Visual	No scuffing on cylinder walls or piston	<u>EM-103</u>

^{*1:} Turn the ignition switch ON.

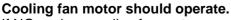
For more information, refer to CO-7, "OVERHEATING CAUSE ANALYSIS".

Component Inspection **COOLING FAN MOTORS-1 AND -2**

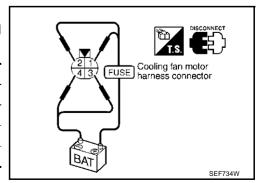
ABS008AN

- Disconnect cooling fan motor harness connectors.
- Supply cooling fan motor terminals with battery voltage and check operation.

	Speed -	terminals		
		(+)	(–)	
	Low	1	3	
Cooling fan motor		2	4	
	High	1 and 2	3 and 4	



If NG, replace cooling fan motor.



^{*2:} Engine running at 3,000 rpm for 10 minutes.

^{*3:} Drive at 90 km/h (55 MPH) for 30 minutes and then let idle for 10 minutes.

^{*4:} After 60 minutes of cool down time.

DTC P1225 TP SENSOR

PFP:16119

Component Description

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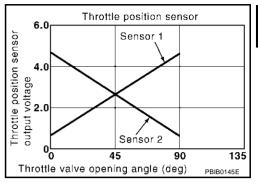
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Electric Throttle Control Actuator consists of throttle control motor, throttle position sensor, etc. The throttle position sensor responds to the throttle valve movement.

The throttle position sensor has the 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



On Board Diagnosis Logic

ABS008AP

The MIL will not light up for this diagnosis.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1225 1225	Closed throttle position learning performance problem	Closed throttle position learning value is excessively low.	Electric throttle control actuator (TP sensor 1 and 2)

DTC Confirmation Procedure

ABS008AQ

NOTE

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

(P) WITH CONSULT-II

- 1. Turn ignition switch ON.
- Select "DATA MONITOR" mode with CONSULT-II.
- 3. Turn ignition switch OFF, wait at least 10 seconds.
- 4. Turn ignition switch ON.
- 5. If 1st trip DTC is detected, go to <u>EC-1148, "Diagnostic Procedure"</u>.

DATA M	ONITOR]
MONITOR	NO DTC	
ENG SPEED	XXX rpm	
		SEF058

Follow the procedure "WITH CONSULT-II" above.

Diagnostic Procedure

1. CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

ABS008AR

- Turn ignition switch OFF.
- 2. Remove the intake air duct.
- 3. Check if foreign matter is caught between the throttle valve and the housing.

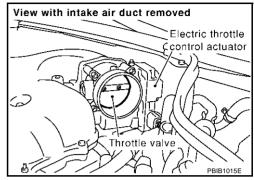
OK or NG

OK

>> GO TO 2.

NG

>> Remove the foreign matter and clean the electric throttle control actuator inside.



2. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

- Replace the electric throttle control actuator.
- Perform EC-692, "Throttle Valve Closed Position Learning". 2.
- Perform EC-692, "Idle Air Volume Learning".

>> INSPECTION END

Removal and Installation **ELECTRIC THROTTLE CONTROL ACTUATOR**

ABS008AS

Refer to EM-18, "INTAKE MANIFOLD COLLECTOR".

DTC P1226 TP SENSOR

PFP:16119

Component Description

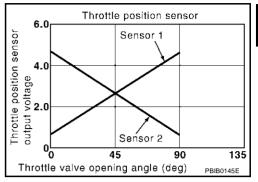
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Electric Throttle Control Actuator consists of throttle control motor, throttle position sensor, etc. The throttle position sensor responds to the throttle valve movement.

The throttle position sensor has the 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



On Board Diagnosis Logic

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The MIL will not light up for this diagnosis.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1226 1226	Closed throttle position learning performance problem	Closed throttle position learning is not performed successfully, repeatedly.	Electric throttle control actuator (TP sensor 1 and 2)

DTC Confirmation Procedure

ABS008AV

NOTE:

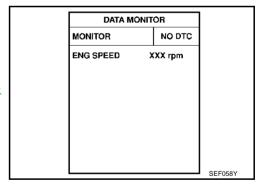
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

(WITH CONSULT-II

- 1. Turn ignition switch ON.
- Select "DATA MONITOR" mode with CONSULT-II.
- 3. Turn ignition switch OFF, wait at least 10 seconds.
- 4. Turn ignition switch ON.
- Repeat steps 3 and 4 for 32 times.
- 6. If 1st trip DTC is detected, go to EC-1150, "Diagnostic Procedure".



WITH GST

Follow the procedure "With CONSULT-II" above.

Diagnostic Procedure

1. CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

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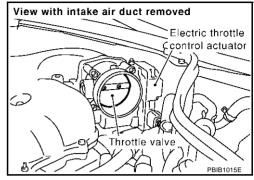
- 1. Turn ignition switch OFF.
- 2. Remove the intake air duct.
- 3. Check if foreign matter is caught between the throttle valve and the housing.

OK or NG

OK >> GO TO 2.

NG :

>> Remove the foreign matter and clean the electric throttle control actuator inside.



2. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

- 1. Replace the electric throttle control actuator.
- 2. Perform EC-692, "Throttle Valve Closed Position Learning".
- 3. Perform EC-692, "Idle Air Volume Learning".

>> INSPECTION END

Removal and Installation ELECTRIC THROTTLE CONTROL ACTUATOR

Refer to EM-18, "INTAKE MANIFOLD COLLECTOR".

ABS008AX

DTC P1229 SENSOR POWER SUPPLY

[TYPE 2]

DTC P1229 SENSOR POWER SUPPLY

On Board Diagnosis Logic

PFP:16119

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This self-diagnosis has the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1229 1229	Sensor power supply circuit short	ECM detects a voltage of power source for sensor is excessively low or high.	Harness or connectors (APP sensor 1 circuit is shorted.) (EVAP control system pressure sensor circuit is shorted.) (PSP sensor circuit is shorted.) (Refrigerant pressure sensor circuit is shorted.) Accelerator pedal position sensor (APP sensor 1) EVAP control system pressure sensor Power steering pressure sensor Refrigerant pressure sensor

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Engine operation condition in fail-safe mode

ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.

DTC Confirmation Procedure

ABS00D9X

NOTE:

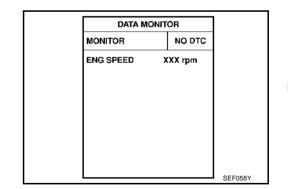
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

(P) WITH CONSULT-II

- 1. Turn ignition switch ON.
- Select "DATA MONITOR" mode with CONSULT-II.
- Start engine and let it idle for 1 second.
- 4. If DTC is detected, go to EC-1153, "Diagnostic Procedure".



WITH GST

Follow the procedure "WITH CONSULT-II" above.

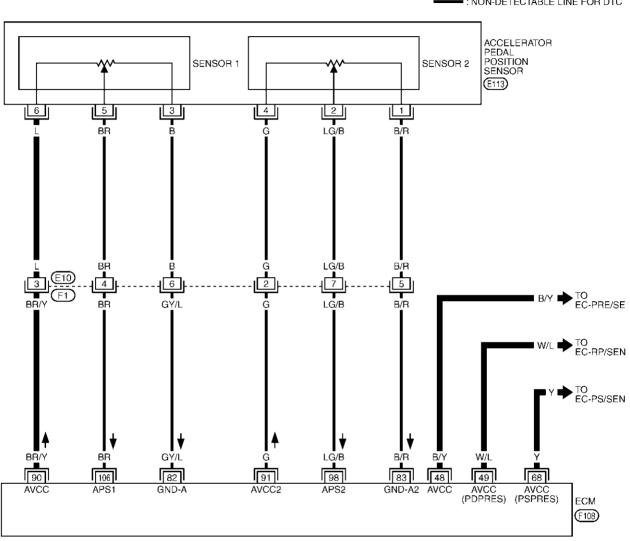
Revision; 2004 April **EC-1151** 2003 G35 Sedan

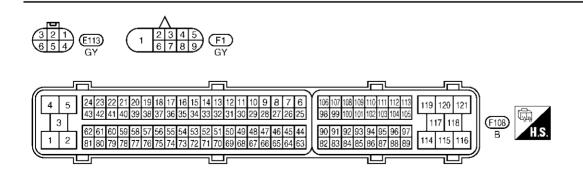
Wiring Diagram

ABS00D9

EC-SEN/PW-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





TBWB0145E

DTC P1229 SENSOR POWER SUPPLY

[TYPE 2]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
48	B/Y	Sensors' power supply (EVAP control system pressure sensor)	[Ignition switch: ON]	Approximately 5V
49	W/L	Sensors' power supply (Refrigerant pressure sensor)	[Ignition switch: ON]	Approximately 5V
68	Y	Sensors' power supply (Power steering pressure sensor)	[Ignition switch: ON]	Approximately 5V
90	BR/Y	Sensors' power supply (APP sensor 1)	[Ignition switch: ON]	Approximately 5V

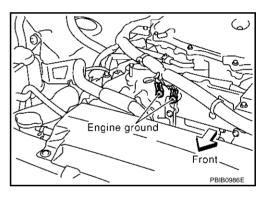
Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

Turn ignition switch OFF.

2. Loosen and retighten engine ground screws.

>> GO TO 2.



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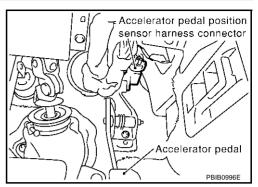
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2. CHECK ACCELERATOR PEDAL POSITION SENSOR 1 POWER SUPPLY CIRCUIT

- Disconnect accelerator pedal position (APP) sensor harness connector.
- 2. Turn ignition switch ON.

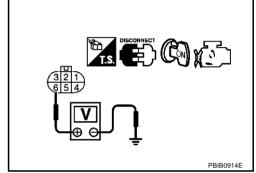


Check voltage between APP sensor terminal 6 and ground with CONSULT-II or tester.

Voltage: Approximately 5V

OK or NG

OK >> GO TO 5. NG >> GO TO 3.



3. CHECK SENSOR POWER SUPPLY CIRCUITS

Check harness for short to power and short to ground, between the following terminals.

ECM terminal	Sensor terminal	Reference Wiring Diagram
90	APP sensor terminal 6	EC-1152
48	EVAP control system pressure sensor terminal 3	EC-1003
49	Refrigerant pressure sensor terminal 1	EC-1266
68	PSP sensor terminal 1	EC-1046

OK or NG

OK >> GO TO 4

NG >> Repair short to ground or short to power in harness or connectors.

4. CHECK COMPONENTS

Check the following.

- EVAP control system pressure sensor (Refer to <u>EC-1000, "Component Inspection"</u>.)
- Refrigerant pressure sensor (Refer to <u>ATC-103, "COMPONENT INSPECTION"</u>.)
- Power steering pressure sensor (Refer to <u>EC-1049</u>, "Component Inspection".)

OK or NG

OK >> GO TO 7.

NG >> Replace malfunctioning component.

5. CHECK APP SENSOR

Refer to EC-1216, "Component Inspection".

OK or NG

OK >> GO TO 7. NG >> GO TO 6.

DTC P1229 SENSOR POWER SUPPLY

[TYPE 2]

6. REPLACE ACCELERATOR PEDAL ASSEMBLY

- 1. Replace the accelerator pedal assembly.
- 2. Perform EC-692, "Accelerator Pedal Released Position Learning".
- 3. Perform EC-692, "Throttle Valve Closed Position Learning".
- 4. Perform EC-692, "Idle Air Volume Learning".

>> INSPECTION END

7. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

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DTC P1444 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE ITYPE 21

DTC P1444 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

PFP:14920

Description SYSTEM DESCRIPTION

ABS008B2

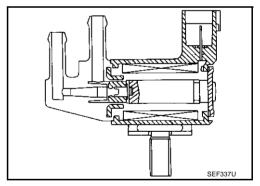
Sensor	Input Signal to ECM	ECM function	Actuator	
Crankshaft position sensor (POS) Camshaft position sensor (PHASE)	Engine speed *1			
Mass air flow sensor	Amount of intake air			
Engine coolant temperature sensor	Engine coolant temperature			
Battery	Battery voltage*1		EVAP canister purge vol- ume control solenoid valve	
Throttle position sensor	Throttle position	EVAP canister purge flow control		
Accelerator pedal position sensor	Accelerator pedal position	Fange nem commen		
Heated oxygen sensors 1	Density of oxygen in exhaust gas (Mixture ratio feedback signal)			
Fuel tank temperature sensor	Fuel temperature in fuel tank			
Vehicle speed signal* ²	Vehicle speed			

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

This system controls flow rate of fuel vapor from the EVAP canister. The opening of the vapor by-pass passage in the EVAP canister purge volume control solenoid valve changes to control the flow rate. The EVAP canister purge volume control solenoid valve repeats ON/OFF operation according to the signal sent from the ECM. The opening of the valve varies for optimum engine control. The optimum value stored in the ECM is determined by considering various engine conditions. When the engine is operating, the flow rate of fuel vapor from the EVAP canister is regulated as the air flow changes.

COMPONENT DESCRIPTION

The EVAP canister purge volume control solenoid valve uses a ON/ OFF duty 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.



CONSULT-II Reference Value in Data Monitor Mode

ABS008B3

Specification data are reference values.

MONITOR ITEM	CON	SPECIFICATION	
	Engine: After warming up	Idle	0%
PURG VOL C/V	• Shift lever: N (A/T), Neutral (M/T)		
FORG VOL C/V	Air conditioner switch: OFF	2,000 rpm	_
	No-load		

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

DTC P1444 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE ITYPE 2

On Board Diagnosis Logic

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EVAP 4 1 4	DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	
P1444 1444 EVAP canister purge volume control solenoid valve EVAP canister purge yolume control solenoid valve The canister purge flow is detected during the specified driving conditions, even when EVAP canister purge volume control solenoid valve is stuck open.) EVAP canister purge volume control solenoid valve (The valve is stuck open.) EVAP canister vent control valve EVAP canister purge volume control valve EVAP canister vent control valve EVAP canister vent control valve Hoses (Hoses are connected incorrectly or clogged.)		volume control solenoid	specified driving conditions, even when EVAP canister purge volume control solenoid valve is	solenoid valve (The valve is stuck open.) EVAP canister vent control valve EVAP canister Hoses (Hoses are connected incorrectly or	B

DTC Confirmation Procedure

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NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Always perform test at a temperature of 5°C (41°F) or more.

(P) WITH CONSULT-II

- 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.
- Select "PURG VOL CN/V P1444" of "EVAPORATIVE SYSTEM" in "DTC WORK SUPPORT" mode with CONSULT-II.
- 5. Touch "START".

PURG VOL CN/V	P1444		PURG VOL CN/V	P1444		PURG VOL CN/V P1444	
OUT OF CONDITION			TESTING				
MONITOR			MONITOR		•	COMPLETED	
ENG SPEED	XXX rpm	•	ENG SPEED	XXX rpm	•		
B/FUEL SCHDL	XXX msec		B/FUEL SCHDL	XXX msec			
COOLAN TEMP/S	xxx.c		COOLAN TEMP/S	ххх с			
VHCL SPEED SE	XXX km/h		VHCL SPEED SE	XXX km/h			PBIB0839E

6. Start engine and let it idle until "TESTING" on CONSULT-II changes to "COMPLETED". (It will take approximately 10 seconds.)

If "TESTING" is not displayed after 5 minutes, retry from step 2.

7. Make sure that "OK" is displayed after touching "SELF-DIAG RESULTS". If "NG" is displayed, refer to EC-1160, "Diagnostic Procedure".

WITH GST

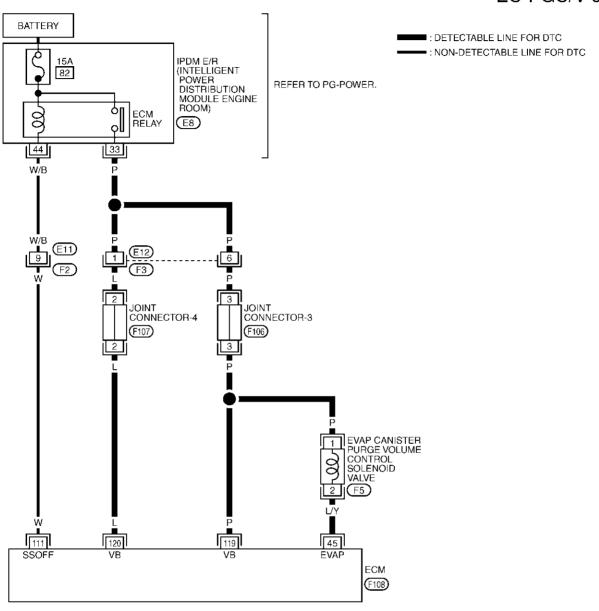
- 1. Start engine and warm it up to normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- Start engine and let it idle for at least 20 seconds.
- 4. Select "MODE 7" with GST.
- 5. If 1st trip DTC is detected, go to EC-1160, "Diagnostic Procedure".

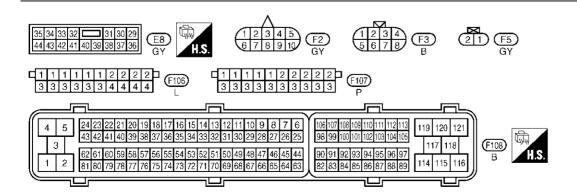
Revision; 2004 April **EC-1157** 2003 G35 Sedan

Wiring Diagram

ABS008B6

EC-PGC/V-01





TBWT0422E

DTC P1444 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE [TYPE 2]

Specification data are reference values and are measured between each terminal and ground. Pulse signal is measured by CONSULT-II.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
45	LY	EVAP canister purge volume control solenoid valve	[Engine is running] ● Idle speed	BATTERY VOLTAGE (11 - 14V)* INTERPRETATION OF THE PROPERTY O
			 [Engine is running] ● Engine speed is about 2,000 rpm (More than 100 seconds after starting engine). 	BATTERY VOLTAGE (11 - 14V)* SEC991C
111	W	ECM relay (Self shut-off)	[Engine is running] [Ignition switch: OFF] • For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF]A few seconds passed after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
119 120	P L	Power supply for ECM	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14V)

^{★:} Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

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Revision; 2004 April **EC-1159** 2003 G35 Sedan

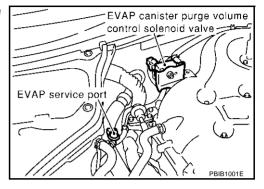
DTC P1444 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Diagnostic Procedure

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1. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE POWER SUPPLY CIR-

- 1. Turn ignition switch OFF.
- 2. Disconnect EVAP canister purge volume control solenoid valve harness connector.
- 3. Turn ignition switch ON.

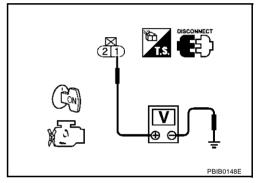


Check voltage between EVAP canister purge volume control solenoid valve terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 3. NG >> GO TO 2.



2. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Joint connector-3
- Joint connector-4
- IPDM E/R harness connector E8
- 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 harness or connectors.

3. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OUTPUT SIGNAL CIR-CUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check harness continuity between ECM terminal 45 and EVAP canister purge volume control solenoid valve terminal 2. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 4.

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

DTC P1444 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

4. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR CONNECTOR

- Disconnect EVAP control system pressure sensor harness connector.
- Check connectors for water.

Water should not exist.

OK or NG

OK >> GO TO 5.

>> Replace EVAP control system pressure sensor. NG

5. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-1006, "Component Inspection".

OK or NG

OK (With CONSULT-II)>>GO TO 6.

OK (Without CONSULT-II)>>GO TO 7.

>> Replace EVAP control system pressure sensor.

6. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

(P) With CONSULT-II

- 1. Turn ignition switch OFF.
- Reconnect harness connectors disconnected.
- Start engine.
- 4. Perform "PURG VOL CONT/V" in "ACTIVE TEST" mode with CONSULT-II. Check that engine speed varies according to the valve opening.

OK or NG

OK >> GO TO 8.

NG >> GO TO 7.

ACTIVE TES	iΤ		
PURG VOL CONT/V	0 %		
MONITOR	MONITOR		
ENG SPEED	XXX rpm		
HO2S1 MNTR (B1)	LEAN		
HO2S1 MNTR (B2)	LEAN		
A/F ALPHA-B1	XXX %		
A/F ALPHA-B2	XXX %		

7. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-1163, "Component Inspection".

OK or NG

OK >> GO TO 8.

NG >> Replace EVAP canister purge volume control solenoid valve.

8. CHECK RUBBER TUBE FOR CLOGGING

- 1. Disconnect rubber tube connected to EVAP canister vent control valve.
- 2. Check the rubber tube for clogging.

OK or NG

OK >> GO TO 9.

NG >> Clean the rubber tube using an air blower.

9. CHECK EVAP CANISTER VENT CONTROL VALVE

Refer to EC-996, "Component Inspection".

OK or NG

OK >> GO TO 10.

NG >> Replace EVAP canister vent control valve.

EC-1161 Revision; 2004 April

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2003 G35 Sedan

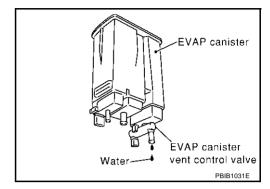
DTC P1444 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE ITYPE 21

10. CHECK IF EVAP CANISTER 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.

Yes or No

Yes >> GO TO 11. No >> GO TO 13.



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).

OK or NG

OK >> GO TO 13. NG >> GO TO 12.

12. DETECT MALFUNCTIONING PART

Check the following.

- EVAP canister for damage
- EVAP hose between EVAP canister and water separator for clogging or poor connection
 - >> Repair hose or replace EVAP canister.

13. CHECK WATER SEPARATOR

Refer to EC-1032, "Component Inspection".

OK or NG

OK >> GO TO 14.

NG >> Clean or replace water separator.

14. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

DTC P1444 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE **[TYPE 2]**

Component Inspection EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

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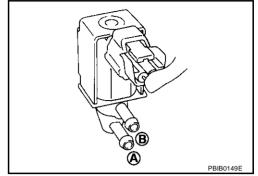
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(P) With CONSULT-II

Check air passage continuity of EVAP canister purge volume control solenoid valve under the following conditions.

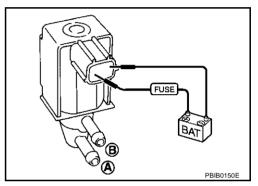
Condition (PURG VOL CONT/V value)	Air passage continuity between A and B
100%	Yes
0%	No



⊗ Without CONSULT-II

Check air passage continuity of EVAP canister purge volume control solenoid valve under the following conditions.

Condition	Air passage continuity between A and B
12V direct current supply between terminals 1 and 2	Yes
No supply	No



Removal and Installation **EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE**

Refer to EM-18, "INTAKE MANIFOLD COLLECTOR".

ABS008B9

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PFP:14935

Component Description

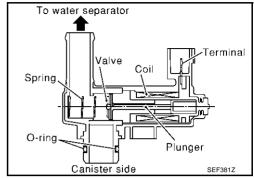
ABS008BA

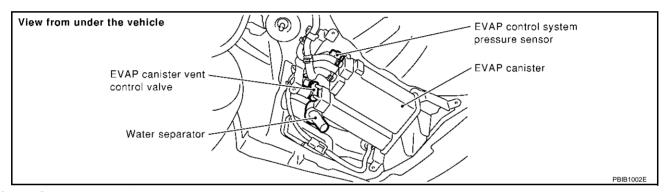
The EVAP canister vent control valve is located on the EVAP canister and is used to seal the canister vent.

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.





CONSULT-II Reference Value in Data Monitor Mode

ABS008BB

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
VENT CONT/V	Ignition switch: ON	OFF

On Board Diagnosis Logic

ABS008BC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1446 1446	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
			Water separator
			EVAP canister is saturated with water

[TYPE 2]

DTC Confirmation Procedure

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NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

(P) WITH CONSULT-II

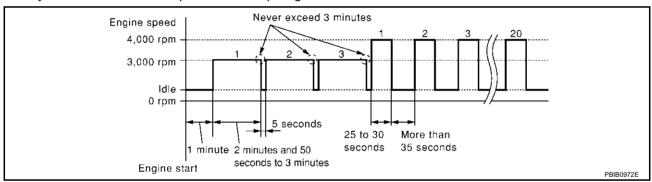
- 1. Turn ignition switch ON and wait at least 5 seconds.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-II.
- 4. Start engine and let it idle for at least 1 minute.
- Repeat next procedures 3 times.
- a. Increase the engine speed up to 3,000 to 3,500 rpm and keep it for 2 minutes and 50 seconds to 3 minutes.

Never exceed 3 minutes.

- b. Fully released accelerator pedal and keep engine idle for about 5 seconds.
- If 1st trip DTC is detected, go to <u>EC-1167</u>, "<u>Diagnostic Procedure</u>".

If 1st trip DTC is not detected, go to the next step.

- 7. Repeat next procedure 20 times.
- a. Quickly increase the engine speed up to 4,000 to 4,500 rpm or more and keep it for 25 to 30 seconds.
- Fully released accelerator pedal and keep engine idle for at least 35 seconds.



8. If 1st trip DTC is detected, go to EC-1167, "Diagnostic Procedure".

WITH GST

Follow the procedure "WITH CONSULT-II" above.

DATA MONITOR

MONITOR NO DTC

ENG SPEED XXX rpm

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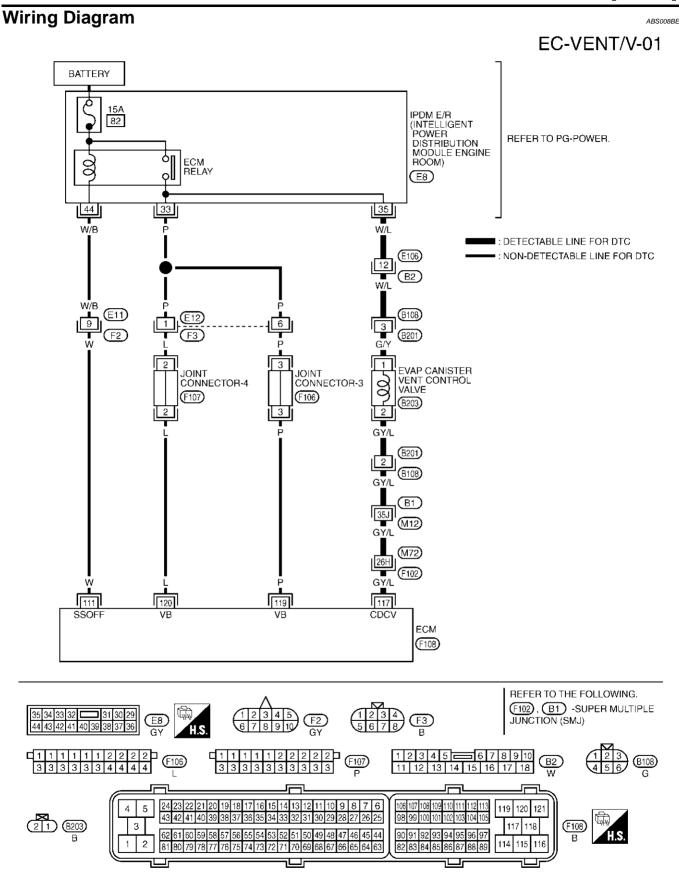
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[TYPE 2]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

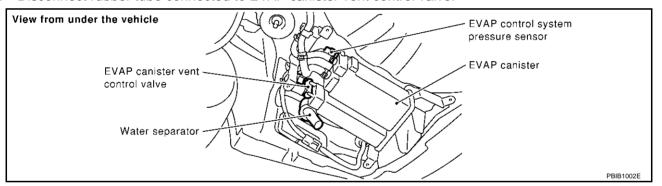
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
111	W ECM relay		[Engine is running][Ignition switch: OFF]For a few seconds after turning ignition switch OFF	0 - 1.5V
		(Self shut-off)	[Ignition switch: OFF]A few seconds passed after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
117	GY/L	EVAP canister vent control valve	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14V)
119 120	P L	Power supply for ECM	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

1. CHECK RUBBER TUBE

- Turn ignition switch OFF.
- Disconnect rubber tube connected to EVAP canister vent control valve.



3. Check the rubber tube for clogging.

OK or NG

OK >> GO TO 2.

NG >> Clean rubber tube using an air blower.

2. CHECK WATER SEPARATOR

Refer to EC-1032, "Component Inspection".

OK or NG

OK >> GO TO 3.

NG >> Clean or replace water separator.

3. CHECK EVAP CANISTER VENT CONTROL VALVE

Refer to EC-1169, "EVAP CANISTER VENT CONTROL VALVE".

OK or NG

OK >> GO TO 4.

NG >> Replace EVAP canister vent control valve.

EC-1167 2003 G35 Sedan Revision; 2004 April

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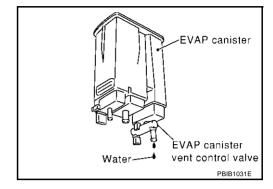
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4. CHECK IF EVAP CANISTER SATURATED WITH WATER

- 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.

Yes or No

Yes >> GO TO 5. No >> GO TO 7.



5. 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).

OK or NG

OK >> GO TO 7. NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- EVAP canister for damage
- EVAP hose between EVAP canister and water separator for clogging or poor connection
 - >> Repair hose or replace EVAP canister.

7. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR CONNECTOR

- 1. Disconnect EVAP control system pressure sensor harness connector.
- Check connectors for water.

Water should not exist.

OK or NG

OK >> GO TO 8.

NG >> Replace EVAP control system pressure sensor.

8. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-1006, "Component Inspection".

OK or NG

OK >> GO TO 9.

NG >> Replace EVAP control system pressure sensor.

9. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

[TYPE 21

Component Inspection EVAP CANISTER VENT CONTROL VALVE

ABS008BG

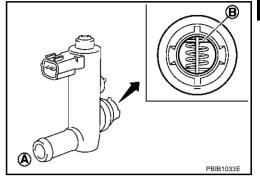
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(P) With CONSULT-II

- 1. Remove EVAP canister vent control valve from EVAP canister.
- Check portion **B** of EVAP canister vent control valve for being rusted.
 - If NG, replace EVAP canister vent control valve. If OK, go to next step.
- 3. Reconnect harness connectors disconnected.
- 4. Turn ignition switch ON.



5. Perform "VENT CONTROL/V" in "ACTIVE TEST" mode.

Check air passage continuity and operation delay time. Make sure new O-ring is installed properly.

Condition VENT CONTROL/V	Air passage continuity between A and B
ON	No
OFF	Yes

Operation takes less than 1 second.

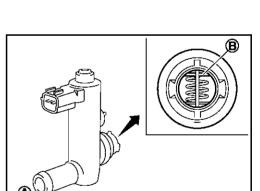
If NG, replace EVAP canister vent control valve.

If OK, go to next step.

- 7. Clean the air passage (Portion A to B) of EVAP canister vent control valve using an air blower.
- 8. Perform step 6 again.

⋈ Without CONSULT-II

- Remove EVAP canister vent control valve from EVAP canister.
- Check portion **B** of EVAP canister vent control valve for being rusted.



Check air passage continuity and operation delay time under the following conditions.

Make sure new O-ring is installed properly.

Condition	Air passage continuity between A and B
12V direct current supply between terminals 1 and 2	No
OFF	Yes

Operation takes less than 1 second.

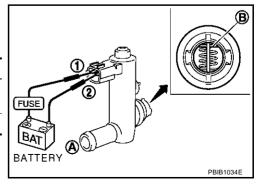
If NG, replace EVAP canister vent control valve.

If OK, go to next step.

Clean the air passage (Portion A to B) of EVAP canister vent control valve using an air blower.

ACTIVE TEST VENT CONTROL/V OFF MONITOR **ENG SPEED** XXX rpm A/F ALPHA-B1 XXX % A/F ALPHA-B2 XXX % HO2S1 (B1) XXX V HO2S1 (B2) XXX V PBIB0151E

PBIB1033E



[TYPE 2]

5. Perform step 3 again.

[TYPE 2]

DTC P1564 ASCD STEERING SWITCH

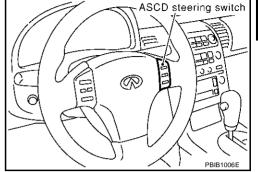
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Component Description

ABS008BH

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 <u>EC-1307</u>, "<u>AUTOMATIC SPEED CONTROL DEVICE</u> (ASCD)" for the ASCD function.



CONSULT-II Reference Value in Data Monitor Mode

ABS008BI

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
MAINI CW	- Impition quitable ON	CRUISE switch: Pressed	ON
MAIN SW	Ignition switch: ON	CRUISE switch: Released	OFF
CANCEL CW	- Ignition quitable ON	CANCEL switch: Pressed	ON
CANCEL SW	Ignition switch: ON	CANCEL switch: Released	OFF
DECLIME/ACC CW	Ignition switch: ON	ACCEL/RES switch: Pressed	ON
RESUME/ACC SW		ACCEL/RES switch: Released	OFF
CET CW	- Ignition quitable ON	COAST/SET switch: Pressed	ON
SET SW	Ignition switch: ON	COAST/SET switch: Released	OFF

On Board Diagnosis Logic

ABS008BJ

2003 G35 Sedan

This self-diagnosis has the one trip detection logic.

The MIL will not light up for this diagnosis.

NOTE

If DTC P1564 is displayed with DTC P0605, first perform the trouble diagnosis for DTC P0605. Refer to <u>EC-1050</u>.

DTC No.	Trouble Diagnosis Name	DTC Detecting Condition	Possible Cause	L
P1564 1564	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 	M

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Revision; 2004 April EC-1171

DTC P1564 ASCD STEERING SWITCH

[TYPE 2]

DTC Confirmation Procedure

NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

(P) WITH CONSULT-II

- 1. Turn ignition switch ON.
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- 3. Wait at least 10 seconds.
- 4. Press CRUISE switch for at least 10 seconds, then release it and wait at least 10 seconds.
- 5. Press ACCEL/RES switch for at least 10 seconds, then release it and wait at least 10 seconds.
- 6. Press COAST/SET switch for at least 10 seconds, then release it and wait at least 10 seconds.
- 7. Press CANCEL switch for at least 10 seconds, then release it and wait at least 10 seconds.
- 8. If DTC is detected, go to EC-1175, "Diagnostic Procedure".

WITH GST

Follow the procedure "WITH CONSULT-II" above.

Wiring Diagram

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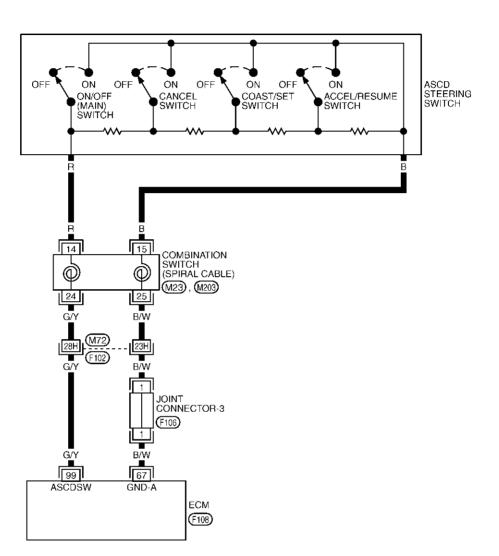
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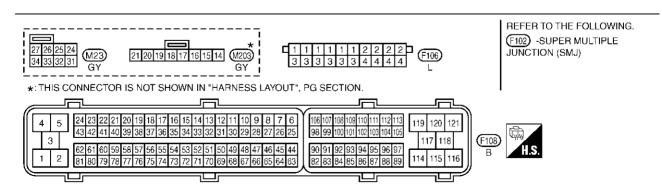
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EC-ASC/SW-01







TBWT0429E

DTC P1564 ASCD STEERING SWITCH

[TYPE 2]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

_				_
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
67	B/W	Sensors' ground (Mass air flow sensor / IAT sensor / Power steering pressure sensor / EVAP control system pressure sensor / ASCD steering switch)	[Engine is running] • Warm-up condition • Idle speed	Approximately 0V
99	G/Y	G/Y ASCD steering switch	[Ignition switch: ON] • ASCD steering switch is released.	Approximately 4V
			[Ignition switch: ON] • CRUISE switch is pressed.	Approximately 0V
			[Ignition switch: ON] • CANCEL switch is pressed.	Approximately 1V
			[Ignition switch: ON] • COAST/SET switch is pressed.	Approximately 2V
			[Ignition switch: ON] • ACCEL/RESUME switch is pressed.	Approximately 3V

Diagnostic Procedure

ABS008BM

1. CHECK ASCD STEERING SWITCH CIRCUIT

(II) With CONSULT-II

- 1. Turn ignition switch ON.
- 2. Select "MAIN SW", "RESUME/ACC SW", "SET SW" and "CANCEL SW" in "DATA MONITOR" mode with CONSULT-II.
- 3. Check each item indication under the following conditions.

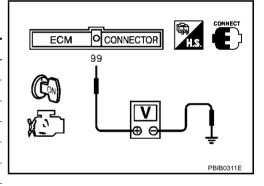
Switch	Monitor item	Condition	Indication
	World lien	Condition	malcation
CRUISE	MAIN SW	Pressed	ON
ONOIGE	WATER OVE	Released	OFF
COAST/SET	SET SW	Pressed	ON
COAST/SET	SET SW	Released	OFF
ACCEL/RES	RESUME/ACC SW	Pressed	ON
ACCEL/NES	RESONE/ACC SW	Released	OFF
CANCEL	L CANCEL SW		ON
OANOLL	OANOLL SW	Released	OFF

DATA MONITOR		
MONITOR NO DTC		
MAIN SW	OFF	
CANCEL SW	OFF	
RESUME/ACC SW	OFF	
SET SW	OFF	

(R) Without CONSULT-II

- 1. Turn ignition switch ON.
- 2. Check voltage between ECM terminal 99 and ground with pressing each button.

Condition	Voltage [V]
Pressed	Approx. 0
Released	Approx. 4
Pressed	Approx. 2
Released	Approx. 4
Pressed	Approx. 3
Released	Approx. 4
Pressed	Approx. 1
Released	Approx. 4
	Pressed Released Pressed Released Pressed Pressed Released Pressed



OK or NG

OK >> GO TO 7. NG >> GO TO 2.

2. CHECK ASCD STEERING SWITCH GROUND CIRCUIT FOR OPEN AND SHORT

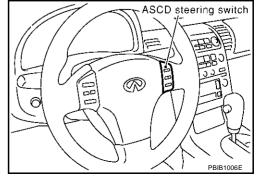
- Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Disconnect combination switch harness connector M203.
- 4. Check harness continuity between combination switch terminal 15 and ECM terminal 67. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 4. NG >> GO TO 3.



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$\overline{3}$. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M72, F102
- Joint connector-3
- Combination switch (spiral cable)
- Harness for open and short between ECM and combination switch
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK ASCD STEERING SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

 Check harness continuity between ECM terminal 99 and combination switch terminal 14. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 6. NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M72, F102
- Combination switch (spiral cable)
- Harness for open and short between ECM and combination switch
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK ASCD STEERING SWITCH

Refer to EC-1177, "Component Inspection".

OK or NG

OK >> GO TO 7.

NG >> Replace steering wheel.

7. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

DTC P1564 ASCD STEERING SWITCH

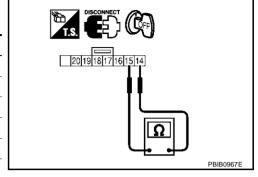
[TYPE 2]

Component Inspection ASCD STEERING SWITCH

ABS008BN

- 1. Disconnect combination switch (spiral cable).
- 2. Check continuity between combination switch (spiral cable) terminals 14 and 15 with pushing each switch.

Switch	Condition	Resistance $[\Omega]$
CRUISE SW	Pressed	Approx. 0
CRUISE SW	Released	Approx. 4,000
COAST/SET SW	Pressed	Approx. 660
COAST/SET SW	Released	Approx. 4,000
ACCEL/RES SW	Pressed	Approx. 1,480
ACCEL/NES SW	Released	Approx. 4,000
CANCEL SW	Pressed	Approx. 250
	Released	Approx. 4,000



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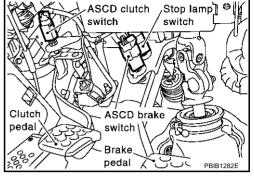
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Component Description

ABS008BO

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 this input of two kinds (ON/OFF signal).

Refer to <u>EC-1307</u>, <u>"AUTOMATIC SPEED CONTROL DEVICE</u> (ASCD)" for the ASCD function.



CONSULT-II Reference Value in Data Monitor Mode

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Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
DDAKE OW 4		Clutch pedal (M/T) and brake pedal: Fully released	ON
BRAKE SW 1 (ASCD brake switch)	Ignition switch: ON	Clutch pedal (M/T) and/or brake pedal: Slightly depressed	OFF
BRAKE SW 2	Ignition switch: ON	Brake pedal fully released	OFF
(stop lamp switch)	• Igrillion Switch. ON	Brake pedal depressed	ON

On Board Diagnosis Logic

ABS008BQ

This self-diagnosis has the one trip detection logic.

The MIL will not light up for this diagnosis.

NOTE:

- If DTC P 1572 is displayed with DTC P0605, first perform the trouble diagnosis for DTC P0605.
 Refer to EC-1050
- This self-diagnosis has 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 30km/h (19 MPH), ON signals from the stop lamp switch and the ASCD brake switch are sent to 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 1572	ASCD brake switch	B)	ASCD brake switch signal is not sent to ECM for extremely long time while the vehicle is driving	 Harness or connectors (M/T models) (The ASCD clutch switch circuit is shorted.) Stop lamp switch ASCD brake switch ASCD clutch switch (M/T models) Incorrect stop lamp switch installation Incorrect ASCD brake switch installation Incorrect ASCD clutch switch installation (M/T models) ECM 	

[TYPE 2]

DTC confirmation Procedure

ABS008BR

CAUTION:

Always drive vehicle at a safe speed.

NOTE

- If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
- Procedure for malfunction B is not described here. It takes extremely long time to complete procedure for malfunction B. By performing procedure for malfunction A, the incident that causes malfunction B can be detected.

TESTING CONDITION:

Steps 4 and 5 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.

(II) WITH CONSULT-II

- 1. Start engine (VDC switch OFF).
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- Press CRUISE switch and make sure that CRUISE indicator lights up.
- 4. Drive the vehicle for at least 5 consecutive seconds under the following condition.

VHCL SPEED SE	More than 30 km/h (19 MPH)
Selector lever	Suitable position

If 1st trip DTC is detected, go to EC-1184, "Diagnostic Procedure".

If 1st trip DTC is not detected, go to the following step.

5. Drive the vehicle for at least 5 consecutive seconds under the following condition.

VHCL SPEED SE	More than 30 km/h (19 MPH)
Selector lever	Suitable position
Driving location	Depress the brake pedal for more than five seconds so as not to come off from the above-mentioned vehicle speed.

If 1st trip DTC is detected, go to EC-1184, "Diagnostic Procedure".

WITH GST

Follow the procedure "WITH CONSULT-II" above.

DATA MONITOR

MONITOR

NO DTC

ENG SPEED XXX rpm
VHCL SPEED SE XXX km/h
CRUISE LAMP ON
BRAKE SW 1 ON
BRAKE SW 2 OFF

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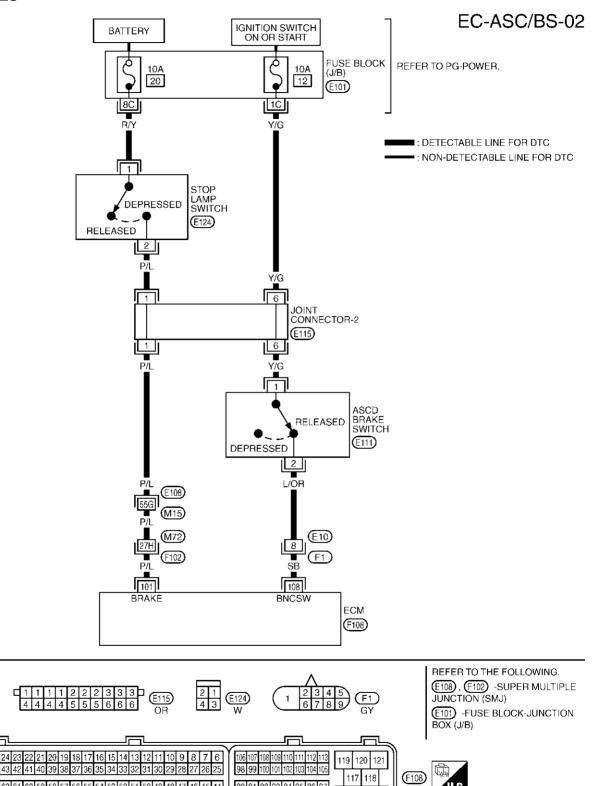
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Wiring Diagram
A/T MODELS

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[TYPE 2]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
101 P/L Stop lamp switch	[Ignition switch: ON] ● Brake pedal is fully released	Approximately 0V		
	[Ignition switch: ON] ● Brake pedal is depressed	BATTERY VOLTAGE (11 - 14V)		
108 SB ASCD brake switch	[Ignition switch: ON] • Brake pedal is depressed	Approximately 0V		
	[Ignition switch: ON] • Brake pedal is fully released	BATTERY VOLTAGE (11 - 14V)		

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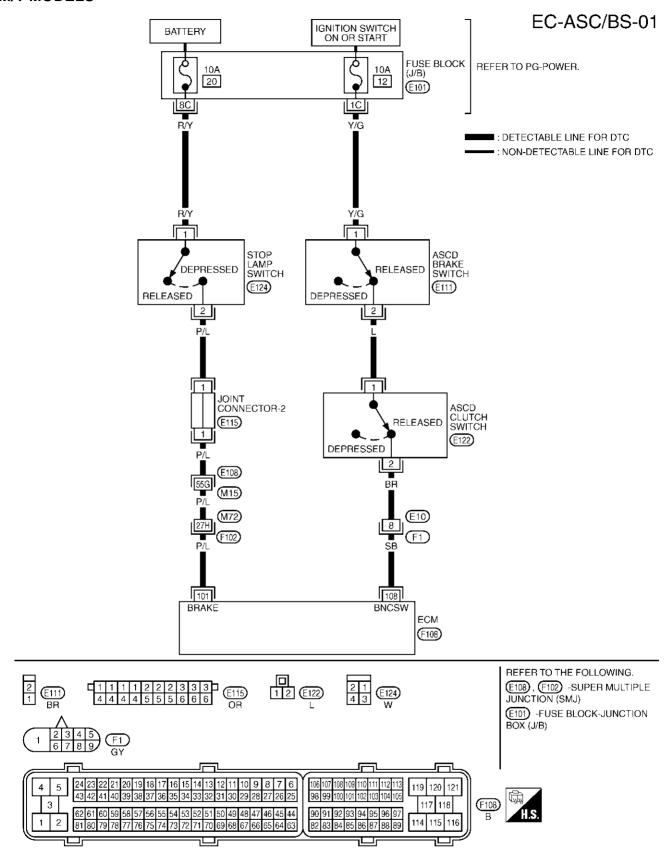
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M/T MODELS



TBWT0457E

[TYPE 2]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
101 P/L Stop lamp switch	[Ignition switch: ON] • Brake pedal is fully released	Approximately 0V		
	[Ignition switch: ON] • Brake pedal is depressed	BATTERY VOLTAGE (11 - 14V)		
108 SB ASCD brake switch	[Ignition switch: ON] Brake pedal and/or clutch pedal are depressed dep	Approximately 0V		
	[Ignition switch: ON] • Brake pedal and clutch pedal are fully released	BATTERY VOLTAGE (11 - 14V)		

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[TYPE 2]

Diagnostic Procedure

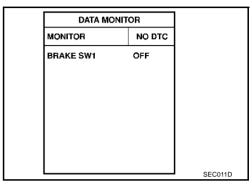
A/T MODELS

1. CHECK OVERALL FUNCTION-I

(II) With CONSULT-II

- 1. Turn ignition switch ON.
- 2. Select "BRAKE SW1" in "DATA MONITOR" mode with CONSULT-II.
- 3. Check "BRAKE SW1" indication under the following conditions.

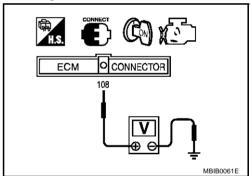
CONDITION	INDICATION
When brake pedal is depressed	OFF
When brake pedal is fully released	ON



(R) Without CONSULT-II

- 1. Turn ignition switch ON.
- 2. Check voltage between ECM terminal 108 and ground under the following conditions.

CONDITION	VOLTAGE
When brake pedal is depressed	Approximately 0V
When brake pedal is fully released	Battery voltage



OK or NG

OK >> GO TO 2. NG >> GO TO 3.

[TYPE 2]

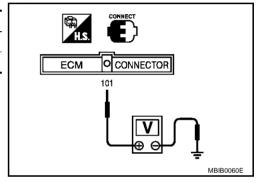
2. CHECK OVERALL FUNCTION-II

With CONSULT-II Check "BRAKE SW2" indication in "DATA MONITOR" mode.

CONDITION	INDICATION
When brake pedal is released	OFF
When brake pedal is depressed	ON

Without CONSULT-II Check voltage between ECM terminal 101 and ground under the following conditions.

CONDITION	VOLTAGE
When brake pedal is released	Approximately 0V
When brake pedal is depressed	Battery voltage



OK or NG

OK >> GO TO 13.

NG >> GO TO 8. EC

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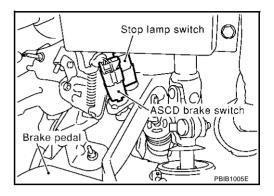
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3. CHECK ASCD BRAKE SWITCH POWER SUPPLY CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect ASCD brake switch harness connector.
- 3. Turn ignition switch ON.

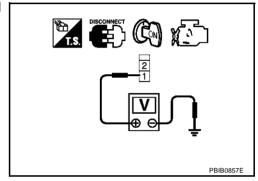


4. Check voltage between ASCD brake switch terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 5. NG >> GO TO 4.



4. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E101
- 10A fuse
- Joint connector-2
- Harness for open or short between ASCD brake switch and fuse
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK ASCD BRAKE SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check harness continuity between ECM terminal 108 and ASCD brake switch terminal 2. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 7. NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E10, F1
- Harness for open or short between ECM and ASCD brake switch
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK ASCD BRAKE SWITCH

Refer to EC-1194, "Component Inspection"

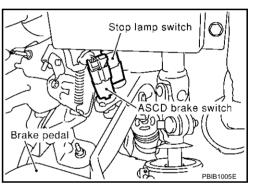
OK or NG

OK >> GO TO 13.

NG >> Replace ASCD brake switch.

8. CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT

- Turn ignition switch OFF.
- Disconnect stop lamp switch harness connector.

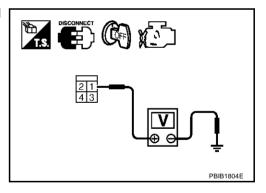


Check voltage between stop lamp switch terminal 1 and ground with CONSULT -II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 10. NG >> GO TO 9.



9. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E101
- 10A fuse
- Harness for open or short between stop lamp switch and fuse
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

EC-1187 Revision; 2004 April 2003 G35 Sedan

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10. CHECK STOP LAMP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Disconnect ECM harness connector.
- 2. Check harness continuity between ECM terminal 101 and stop lamp switch terminal 2. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 12. NG >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness connectors M72, F102
- Joint connector-2
- Harness for open or short between ECM and stop lamp switch

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

12. CHECK STOP LAMP SWITCH

Refer to EC-1194, "Component Inspection"

OK or NG

OK >> GO TO 13.

NG >> Replace stop lamp switch.

13. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

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M/T MODELS

1. CHECK OVERALL FUNCTION-I

(II) With CONSULT-II

- 1. Turn ignition switch ON.
- 2. Select "BRAKE SW1" in "DATA MONITOR" mode with CONSULT-II.
- 3. Check "BRAKE SW1" indication under the following conditions.

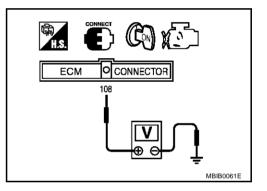
CONDITION	INDICATION
When brake pedal and/or clutch pedal are depressed	OFF
When brake pedal and clutch pedal are fully released	ON

DATA MO	ONITOR	
MONITOR	NO DTC	
BRAKE SW1	OFF	
		SEC011

W Without CONSULT-II

- 1. Turn ignition switch ON.
- 2. Check voltage between ECM terminal 108 and ground under the following conditions.

CONDITION	VOLTAGE
When brake pedal and/or clutch pedal are depressed	Approximately 0V
When brake pedal and clutch pedal are fully released	Battery voltage



OK or NG

OK >> GO TO 2. NG >> GO TO 3.

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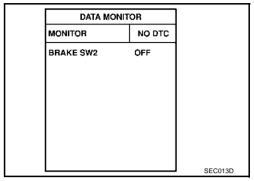
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2. CHECK OVERALL FUNCTION-II

(II) With CONSULT-II

Check "BRAKE SW2" indication in "DATA MONITOR" mode.

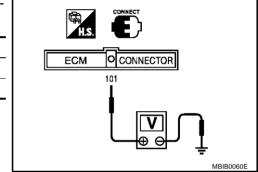
CONDITION	INDICATION
When brake pedal is released	OFF
When brake pedal is depressed	ON



W Without CONSULT-II

Check voltage between ECM terminal 101 and ground under the following conditions.

CONDITION	VOLTAGE
When brake pedal is released	Approximately 0V
When brake pedal is depressed	Battery voltage

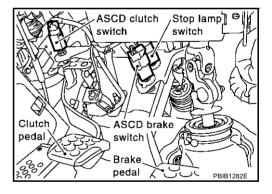


OK or NG

OK >> GO TO 16. NG >> GO TO 11.

3. CHECK ASCD BRAKE SWITCH CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect ASCD clutch switch harness connector.
- 3. Turn ignition switch ON.

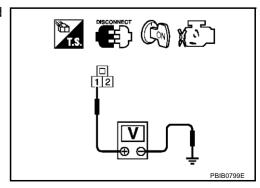


4. Check voltage between ASCD clutch switch terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage

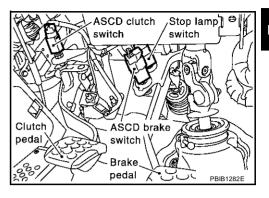
OK or NG

OK >> GO TO 8. NG >> GO TO 4.



4. CHECK ASCD BRAKE SWITCH POWER SUPPLY CIRCUIT

- Turn ignition switch OFF.
- 2. Disconnect ASCD brake switch harness connector.
- Turn ignition switch ON.

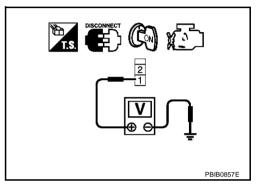


4. Check voltage between ASCD brake switch terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 6. NG >> GO TO 5.



5. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E101
- 10A fuse
- Harness for open or short between ASCD brake switch and fuse
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK ASCD BRAKE SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- Check harness continuity between ASCD brake switch terminal 2 and ASCD clutch switch terminal 1. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 7.

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

7. CHECK ASCD BRAKE SWITCH

Refer to EC-1194, "Component Inspection"

OK or NG

OK >> GO TO 16.

NG >> Replace ASCD brake switch.

EC-1191 Revision; 2004 April 2003 G35 Sedan

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8. CHECK ASCD CLUTCH SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check harness continuity between ASCD clutch switch terminal 2 and ECM terminal 108. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 10. NG >> GO TO 9.

9. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E10, F1
- Harness for open or short between ECM and ASCD clutch switch

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

10. CHECK ASCD CLUTCH SWITCH

Refer to EC-1194, "Component Inspection".

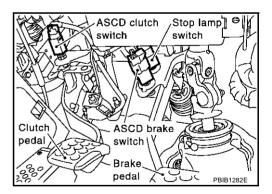
OK or NG

OK >> GO TO 16.

NG >> Replace ASCD clutch switch.

11. CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect stop lamp switch harness connector.

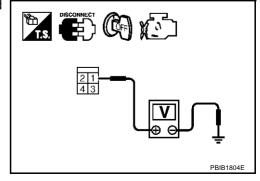


3. Check voltage between stop lamp switch terminal 1 and ground with CONSULT -II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 13. NG >> GO TO 12.



DTC P1572 ASCD BRAKE SWITCH

[TYPE 2]

12. DETECT MALFUNCTIONING PART Check the following. Fuse block (J/B) connector E101 EC 10A fuse Harness for open or short between stop lamp switch and fuse >> Repair open circuit or short to ground or short to power in harness or connectors. 13. CHECK STOP LAMP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT D Disconnect ECM harness connector. 1. Check harness continuity between ECM terminal 101 and stop lamp switch terminal 2. Refer to Wiring Diagram. F Continuity should exist. 3. Also check harness for short to ground and short to power. OK or NG OK >> GO TO 15. NG >> GO TO 14. 14. DETECT MALFUNCTIONING PART Н Check the following. Harness connectors E108, M15 Harness connectors M72, F102 Joint connector-2 Harness for open or short between ECM and stop lamp switch >> Repair open circuit or short to ground or short to power in harness or connectors. 15. CHECK STOP LAMP SWITCH Refer to EC-1194, "Component Inspection" OK or NG OK >> GO TO 16. NG >> Replace stop lamp switch. 16. CHECK INTERMITTENT INCIDENT M

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

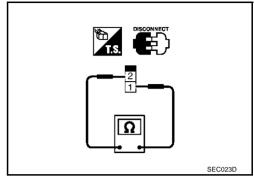
Component Inspection ASCD BRAKE SWITCH

ABS008BU

- 1. Turn ignition switch OFF.
- 2. Disconnect ASCD brake switch harness connector.
- 3. Check harness continuity between ASCD brake switch terminals 1 and 2 under the following conditions.

Condition	Continuity
When brake pedal is fully released.	Should exist.
When brake pedal is depressed.	Should not exist.

If NG, adjust ASCD brake switch installation, refer to <u>BR-6</u>, <u>"BRAKE PEDAL"</u>, and perform step 3 again.

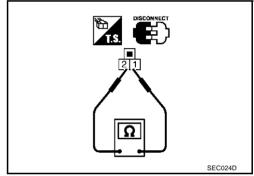


ASCD CLUTCH SWITCH

- 1. Turn ignition switch OFF.
- 2. Disconnect ASCD clutch switch harness connector.
- 3. Check harness continuity between ASCD clutch switch terminals 1 and 2 under the following conditions.

Condition	Continuity
When clutch pedal is fully released.	Should exist.
When clutch pedal is depressed.	Should not exist.

If NG, adjust ASCD clutch switch installation, refer to <u>CL-5</u>, <u>"CLUTCH PEDAL"</u>, and perform step 3 again.

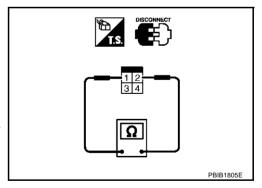


STOP LAMP SWITCH

- 1. Turn ignition switch OFF.
- 2. Disconnect stop lamp switch harness connector.
- 3. Check harness continuity between stop lamp switch terminals 1 and 2 under the following conditions.

Condition	Continuity
When brake pedal is fully released.	Should not exist.
When brake pedal is depressed.	Should exist.

If NG, adjust stop lamp switch installation, refer to <u>BR-6</u>, <u>"BRAKE PEDAL"</u>, and perform step 3 again.



DTC P1574 ASCD VEHICLE SPEED SENSOR

[TYPE 2]

DTC P1574 ASCD VEHICLE SPEED SENSOR

PFP:31036

Component Description

ABS008BV

The ECM receives two vehicle speed sensor signals via CAN communication line. One is sent from combination meter and the other is from TCM (Transmission control module). The ECM uses these signals for ASCD control. Refer to EC-1307, "AUTOMATIC SPEED CONTROL DEVICE (ASCD)" for ASCD functions.

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On Board Diagnosis Logic

BS008BW

This self-diagnosis has the one trip detection logic.

The MIL will not light up for this diagnosis.

NOTE:

- If DTC P1574 is displayed with DTC U1000, U1001, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-788, "DTC U1000, U1001 CAN COMMUNICATION LINE".
- If DTC P1574 is displayed with DTC P0500, first perform the trouble diagnosis for DTC P0500.
 Refer to <u>EC-1039</u>, "<u>DTC P0500 VSS</u>"
- If DTC P1574 is displayed with DTC P0605, first perform the trouble diagnosis for DTC P0605.
 Refer to <u>EC-1050</u>, "DTC P0605 ECM"

DTC No.	Trouble Diagnosis Name	DTC Detecting Condition	Possible Cause	•
			Harness or connectors (The CAN communication line is open or shorted.)	_
P1574	ASCD vehicle speed	ECM detects a difference between two vehicle	Combination meter	
1574	sensor	speed signals is out of the specified range.	VDC/TCS/ABS control unit	
			Wheel sensor	
			• TCM	
			• ECM	

DTC Confirmation Procedure

ABS008BX

CAUTION:

Always drive vehicle at a safe speed.

NOTE

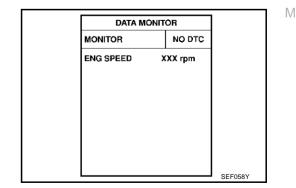
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Step 3 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.

(A) WITH CONSULT-II

- Start engine (VDC switch OFF).
- Select "DATA MONITOR" mode with CONSULT-II.
- 3. Drive the vehicle at more than 40 km/h (25 MPH).
- 4. If DTC is detected, go to EC-1196, "Diagnostic Procedure".



WITH GST

Follow the procedure "WITH CONSULT-II" above.

DTC P1574 ASCD VEHICLE SPEED SENSOR

[TYPE 2]

ABS008BY

Diagnostic Procedure

1. CHECK DTC WITH TCM

Check DTC with TCM. Refer to AT-39.

OK or NG

OK >> GO TO 2.

NG >> Perform trouble shooting relevant to DTC indicated.

2. CHECK DTC WITH VDC/TCS ABS CONTROL UNIT

Refer to BRC-13, "TROUBLE DIAGNOSIS".

OK or NG

OK >> GO TO 3.

NG >> Repair or replace.

3. CHECK COMBINATION METER

Check combination meter function.

Refer to DI-4, "COMBINATION METERS".

>> INSPECTION END

[TYPE 2]

DTC P1706 PNP SWITCH

PFP:32006

Component Description

ARS008RZ

When the gear position is P or N (A/T), Neutral (M/T), park/neutral position (PNP) switch is ON. ECM detects the position because the continuity of the line (the ON signal) exists.

CONSULT-II Reference Value in Data Monitor Mode

ABS008C0

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
P/N POSI SW	Ignition switch: ON	Shift lever: P or N (A/T), Neutral (M/T)	ON
17N1 001 0W	• Igrittori switch. ON	Shift lever: Except above	OFF

On Board Diagnosis Logic

ABS008C1

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1706 1706	Park/neutral position switch	The signal of the park/neutral position (PNP) switch is not changed in the process of engine starting and driving.	 Harness or connectors [The park/neutral position (PNP) switch circuit is open or shorted.] Park/neutral position (PNP) switch Combination meter (A/T models)

DTC Confirmation Procedure

ABS008C2

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-II

- Turn ignition switch ON.
- Select "P/N POSI SW" in "DATA MONITOR" mode with CON-SULT-II. Then check the "P/N POSI SW" signal under the following conditions.

Position (Selector lever)	Known-good signal
P and N position (A/T) Neutral position (M/T)	ON
Except the above position	OFF

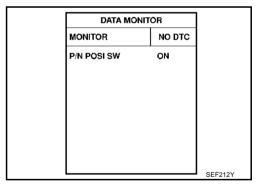
If NG, go to EC-1202, "Diagnostic Procedure".

If OK, go to following step.

- Select "DATA MONITOR" mode with CONSULT-II.
- Start engine and warm it up to normal operating temperature.
- Maintain the following conditions for at least 60 consecutive seconds.

ENG SPEED	1,400 - 6375 rpm
COOLAN TEMP/S	More than 70°C (158°F)
B/FUEL SCHDL	2.0 - 31.8 msec
VHCL SPEED SE	More than 64 km/h (40 MPH)
Selector lever	Suitable position

If 1st trip DTC is detected, go to EC-1202, "Diagnostic Procedure".



DATA MO	NITOR	
MONITOR	NO DTC	
ENG SPEED	XXX rpm	
COOLAN TEMP/S	xxx.c	
VHCL SPEED SE	XXX km/h	
P/N POSI SW	OFF	
B/FUEL SCHDL	XXX msec	

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Overall Function Check

BS008C3

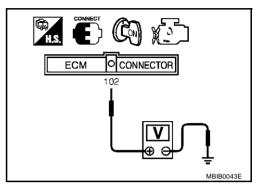
Use this procedure to check the overall function of the park/neutral position (PNP) switch circuit. During this check, a 1st trip DTC might not be confirmed.

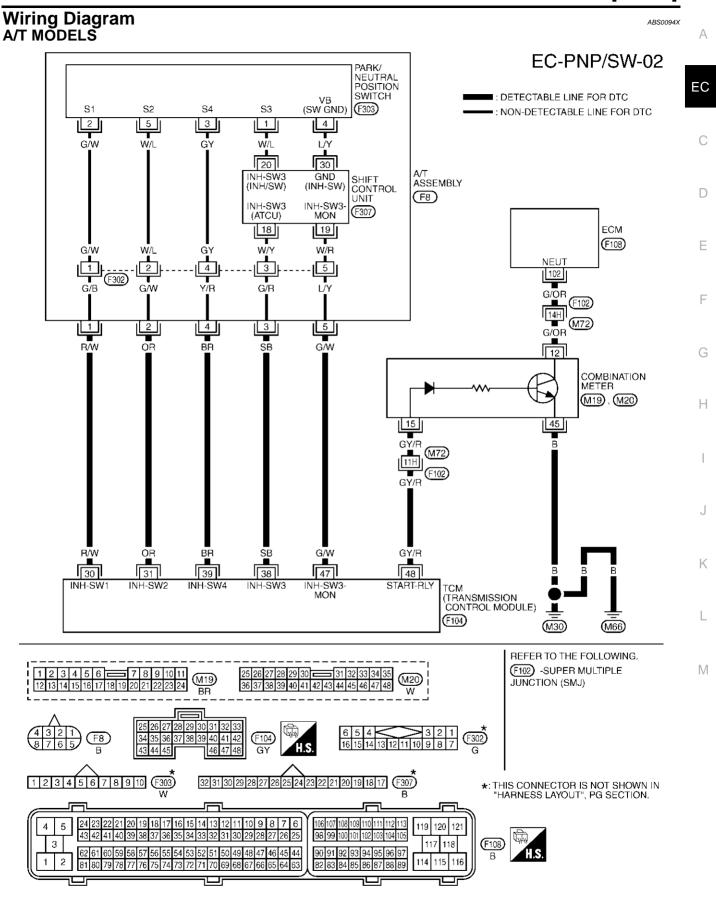
WITH GST

- 1. Turn ignition switch ON.
- 2. Check voltage between ECM terminal 102 (PNP switch signal) and ground under the following conditions.

Condition (Gear position)	Voltage V (Known good data)
P and N position (A/T) Neutral position (M/T)	Approx. 0
Except the above position	BATTERY VOLTAGE (11 - 14V)







TBWT0459E

DTC P1706 PNP SWITCH

[TYPE 2]

Specification data are reference values and are measured between each terminal and ground.

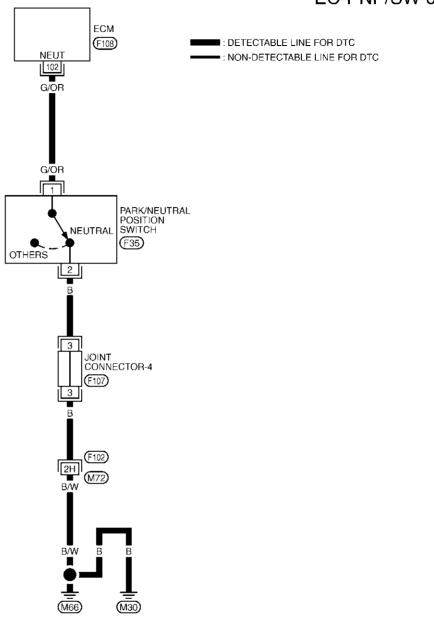
CAUTION:

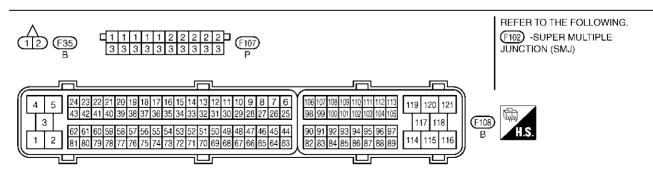
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
102	102 G/OR PNP switch	[Ignition switch: ON] • Shift lever: P or N	Approximately 0V	
102	G/OK	FINE SWILLII	[Ignition switch: ON] • Except the above gear position	BATTERY VOLTAGE (11 - 14V)

M/T MODELS

EC-PNP/SW-01





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Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
102	G/OR	G/OR PNP switch	[Ignition switch: ON] • Shift lever: Neutral	Approximately 0V
102	G/OK	FINE SWILLII	[Ignition switch: ON] • Except the above gear position	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

ABS008C5

A/T MODELS

1. INSPECTION START

Do you have CONSULT-II?

Yes or No

Yes >> GO TO 2.

No >> GO TO 3.

2. CHECK PNP SWITCH SIGNAL

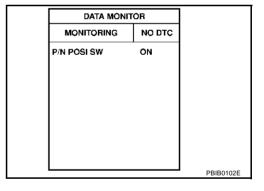
(P) With CONSULT-II

- 1. Turn ignition switch ON.
- 2. Select "A/T", then "DATA MONITOR" mode with CONSULT-II.
- 3. Select "P/N POSI SW" signal and check its indication under the following conditions.

Condition (Gear position)	P/N POSI SW
P or N position	ON
Other position	OFF

OK or NG

OK >> GO TO 5. NG >> GO TO 4.



3. CHECK PNP SWITCH

(R) Without CONSULT-II

Confirm that the PNP switch signal is sent to TCM correctly.

Refer to AT-110, "DTC P0705 PARK/NEUTRAL POSITION SWITCH".

OK or NG

OK >> GO TO 5. NG >> GO TO 4.

4. CHECK INTERMITTENT INCIDENT

Check the PNP switch circuit.

Refer to AT-110, "DTC P0705 PARK/NEUTRAL POSITION SWITCH".

>> INSPECTION END

DTC P1706 PNP SWITCH

[TYPE 2]

5. CHECK PNP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT-I 1. Turn ignition switch OFF. 2. Disconnect TCM harness connector. EC Disconnect combination meter harness connector. Check harness continuity between TCM terminal 48 and combination meter terminal 15. Refer to Wiring Diagram. Continuity should exist. 5. Also check harness for short to ground and short to power. OK or NG OK >> GO TO 7 NG >> GO TO 6. F 6. DETECT MALFUNCTIONING PART Check the following. Harness connectors F102, M72 Harness for open or short between TCM and combination meter >> Repair open circuit or short to ground or short to power in harness or connectors. 7. CHECK PNP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT-II Н Check harness continuity between combination meter terminal 45 and ground. Refer to Wiring Diagram. Continuity should exist. 2. Also check harness for short to power. OK or NG OK >> GO TO 8. NG >> Repair open circuit or short to power in harness or connectors. 8. CHECK PNP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT-III 1. Disconnect ECM harness connector. Check harness continuity between ECM terminal 102 and combination meter terminal 12. Refer to Wiring Diagram. Continuity should exist. M 3. Also check harness for short to ground and short to power. OK or NG OK >> GO TO 10. NG >> GO TO 9.

9. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F102, M72
- Harness for open or short between ECM and combination meter
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

10. CHECK COMBINATION METER

Refer to DI-4, "COMBINATION METERS".

OK or NG

OK >> GO TO 11.

NG >> Replace combination meter

11. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

M/T MODELS

1. CHECK PNP SWITCH GROUND CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect PNP switch harness connector.
- Check harness continuity between PNP switch terminal 2 and ground. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to power.

OK or NG

OK >> GO TO 3 NG >> GO TO 2.

2. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F102, M72
- Joint connector-4
- Harness for open or short between PNP switch and ground
 - >> Repair open circuit or short to power in harness or connectors.

3. CHECK PNP SWITCH INPUT SIGNAL CIRCUIT

- 1. Disconnect ECM harness connector.
- Check harness continuity between ECM terminal 102 and PNP switch terminal 1. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 4.

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

4. CHECK PNP SWITCH

Refer to MT-12, "POSITION SWITCH".

OK or NG

OK >> GO TO 5.

NG >> Replace PNP switch.

DTC P1706 PNP SWITCH

[TYPE 2]

5. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

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[TYPE 2]

DTC P1805 BRAKE SWITCH

PFP:25320

Description

ABS008C6

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 driving.

CONSULT-II Reference Value in Data Monitor Mode

ABS008C7

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
BRAKE SW	Ignition switch: ON	Brake pedal: Fully released	OFF
DIVARL SW		Brake pedal: Slightly depressed	ON

On Board Diagnosis Logic

ABS008C8

The MIL will not light up for this diagnosis.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1805 1805	Brake switch	A brake switch signal is not sent to ECM for an extremely long time while the vehicle is driving.	 Harness or connectors (Stop lamp switch circuit is open or shorted.) Stop lamp switch

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode.

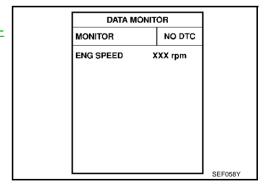
Engine operating condition in fail-safe mode		
ECM controls the electric throttle control actuator by regulating the throttle opening to a small range. Therefore, acceleration will be poor.		
Driving condition		
When engine is idling Normal		
When accelerating Poor acceleration		

DTC Confirmation Procedure

ABS008C9

(II) WITH CONSULT-II

- 1. Turn ignition switch ON.
- 2. Fully depress the brake pedal for at least 5 seconds.
- 3. Erase the DTC with CONSULT-II.
- 4. Select "DATA MONITOR" mode with CONSULT-II.
- 5. If 1st trip DTC is detected, go to EC-1208, "Diagnostic Procedure".



WITH GST

Follow the procedure "WITH CONSULT-II" above.

Wiring Diagram

BS008CA

EC-BRK/SW-01

: DETECTABLE LINE FOR DTC : NON-DETECTABLE LINE FOR DTC

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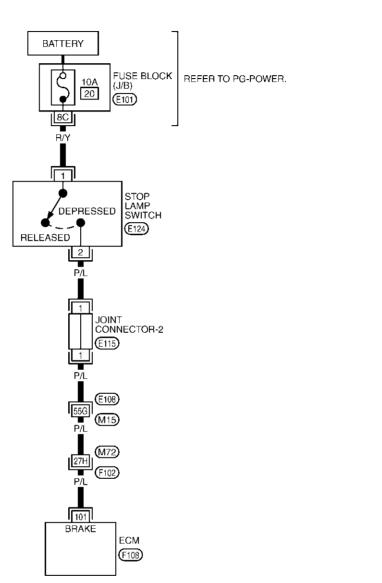
Е

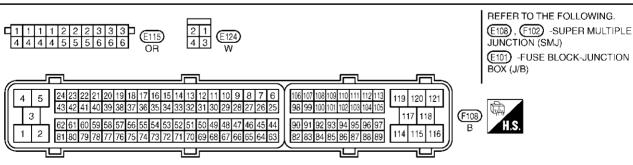
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TBWT0460E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
101	P/L	Stop lamp switch	[Ignition switch: ON] • Brake pedal is fully released	Approximately 0V
101	F/L	Stop famp switch	[Ignition switch: ON] • Brake pedal is depressed	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

ABS008CB

1. CHECK STOP LAMP SWITCH CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Check the stop lamp when depressing and releasing the brake pedal.

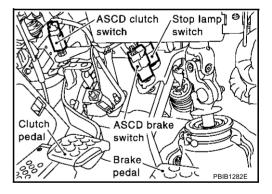
Brake pedal	Stop lamp
Fully released	Not illuminated
Depressed	Illuminated

OK or NG

OK >> GO TO 4. NG >> GO TO 2.

2. CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT

1. Disconnect stop lamp switch harness connector.

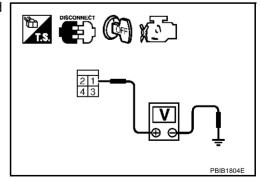


2. Check voltage between stop lamp switch terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 4. NG >> GO TO 3.



$\overline{3}$. DETECT MALFUNCTIONING PART

Check the following.

- 10A fuse
- Fuse block (J/B) connector E101
- Harness for open and short between stop lamp switch and fuse
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK STOP LAMP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

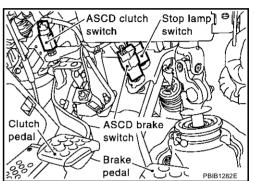
- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Disconnect stop lamp switch harness connector.
- Check harness continuity between ECM terminal 101 and stop lamp switch terminal 2. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 6. NG >> GO TO 5.



5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness connectors M72, F102
- Joint connector-2
- Harness for open or short between ECM and stop lamp switch
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK STOP LAMP SWITCH

Refer to EC-1210, "Component Inspection".

OK or NG

OK >> GO TO 7.

NG >> Replace stop lamp switch.

7. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

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DTC P1805 BRAKE SWITCH

[TYPE 2]

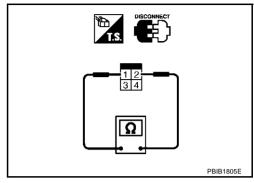
Component Inspection STOP LAMP SWITCH

ABS008CC

- 1. Turn ignition switch OFF.
- 2. Disconnect stop lamp switch harness connector.
- 3. Check harness continuity between stop lamp switch terminals 1 and 2 under the following conditions.

Condition	Continuity
When brake pedal is fully released.	Should not exist.
When brake pedal is depressed.	Should exist.

If NG, adjust stop lamp switch installation, refer to <u>BR-6</u>, <u>"BRAKE PEDAL"</u>, and perform step 3 again.



[TYPE 2]

DTC P2122, P2123 APP SENSOR

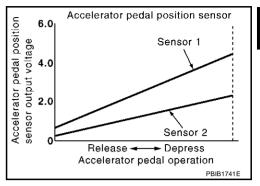
PFP:18002

Component Description

ABS008CD

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 potentiometers 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 feed 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 the engine operation such as fuel cut.

CONSULT-II Reference Value in Data Monitor Mode

ABS008CE

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
ACCEL SEN1	Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.5 - 1.0V
ACCEL SENT		Accelerator pedal: Fully depressed	4.0 - 4.7V
ACCEL SEN2*	Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.3 - 1.2V
		Accelerator pedal: Fully depressed	3.9 - 4.8V
CLSD THL POS	Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	ON
		Accelerator pedal: Slightly depressed	OFF

^{*:} Accelerator pedal position sensor 2 signal is converted by ECM internally. Thus, it differ from ECM terminal voltage,

On Board Diagnosis Logic

ABS008CF

NOTE:

If DTC P2122 or P2123 is displayed with DTC P1229, first perform the trouble diagnosis for DTC P1229. Refer to EC-1151.

These self-diagnoses have the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P2122 2122	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 2123	Accelerator pedal position sensor 1 circuit high input	An excessively high voltage from the APP sensor 1 is sent to ECM.	,

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Engine operating condition in fail-safe mode

The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 dearees.

The ECM regulates the opening speed of the throttle valve to be slower than the normal condition.

So, the acceleration will be poor.

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DTC Confirmation Procedure

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NOTE:

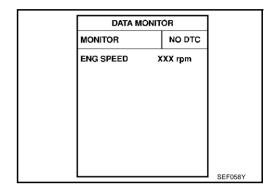
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

(P) WITH CONSULT-II

- 1. Turn ignition switch ON.
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- 3. Start engine and let it idle for 1 second.
- 4. If DTC is detected, go to EC-1214, "Diagnostic Procedure" .



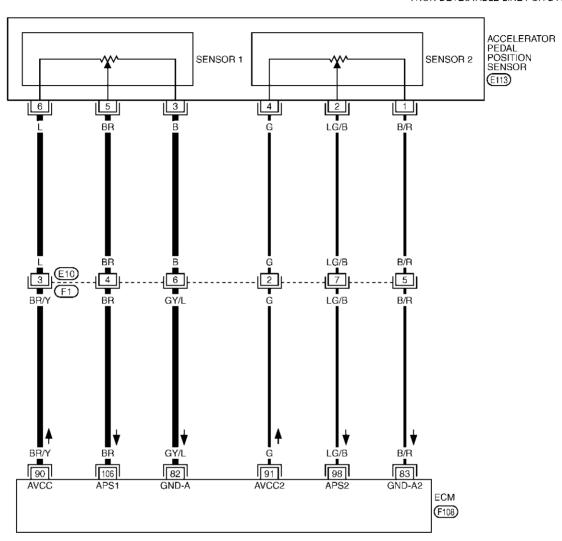
® WITH GST

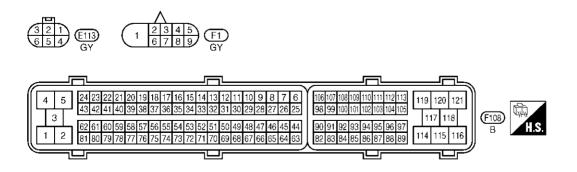
Follow the procedure "WITH CONSULT-II" above.

Wiring Diagram

EC-APPS1-01







TBWT0417E

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Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
82	GY/L	Sensors' ground (APP sensor 1)	[Engine is running]Warm-up conditionIdle speed	Approximately 0V
83	B/R	Sensors' ground (APP sensor 2)	[Engine is running]Warm-up conditionIdle speed	Approximately 0V
90	BR/Y	Sensors' power supply (APP sensor 1)	[Ignition switch: ON]	Approximately 5V
91	G	Sensors' power supply (APP sensor 2)	[Ignition switch: ON]	Approximately 5V
98 I (÷/B	Accelerator pedal position sensor 2	[Ignition switch: ON] • Engine stopped • Accelerator pedal fully released	0.15 - 0.60V	
		[Ignition switch: ON]Engine stoppedAccelerator pedal fully depressed	1.95 - 2.40V	
106 BR	Accelerator pedal position sensor 1	[Ignition switch: ON]Engine stoppedAccelerator pedal fully released	0.5 - 1.0V	
		[Ignition switch: ON]Engine stoppedAccelerator pedal fully depressed	3.9 - 4.7V	

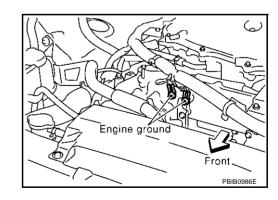
Diagnostic Procedure

ABS008CI

1. RETIGHTEN GROUND SCREWS

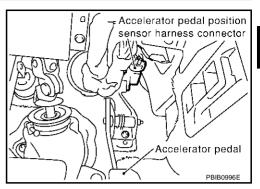
- 1. Turn ignition switch OFF.
- 2. Loosen and retighten engine ground screws.

>> GO TO 2.



$\overline{2}$. CHECK APP SENSOR 1 POWER SUPPLY CIRCUIT

- Disconnect accelerator pedal position (APP) sensor harness connector.
- Turn ignition switch ON.

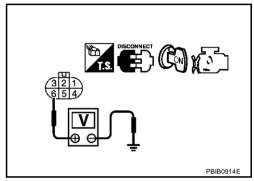


Check voltage between APP sensor terminal 6 and ground with CONSULT-II or tester.

Voltage: Approximately 5V

OK or NG

OK >> GO TO 4. NG >> GO TO 3.



3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E10, F1
- Harness for open or short between ECM and accelerator pedal position sensor
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK APP SENSOR 1 GROUND CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- Disconnect ECM harness connector.
- Check harness continuity between APP sensor terminal 3 and ECM terminal 82. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 6. NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E10, F1
- Harness for open or short between ECM and accelerator pedal position sensor
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

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6. CHECK APP SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal 106 and APP sensor terminal 5. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 8. NG >> GO TO 7.

7. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E10, F1
- Harness for open or short between ECM and accelerator pedal position sensor
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

8. CHECK APP SENSOR

Refer to EC-1240, "Component Inspection".

OK or NG

OK >> GO TO 10. NG >> GO TO 9.

9. REPLACE ACCELERATOR PEDAL ASSEMBLY

- 1. Replace the accelerator pedal assembly.
- 2. Perform EC-692, "Accelerator Pedal Released Position Learning".
- 3. Perform EC-692, "Throttle Valve Closed Position Learning".
- 4. Perform EC-692, "Idle Air Volume Learning".

>> INSPECTION END

10. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

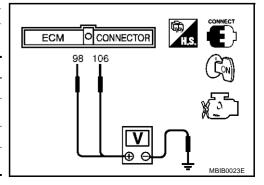
>> INSPECTION END

Component Inspection ACCELERATOR PEDAL POSITION SENSOR

ABS008CJ

- Reconnect all harness connectors disconnected.
- 2. Turn ignition switch ON.
- Check voltage between ECM terminals 106 (APP sensor 1 signal), 98 (APP sensor 2 signal) and engine ground under the following conditions.

Terminal	Accelerator pedal	Voltage
106	Fully released	0.5 - 1.0V
(Accelerator pedal position sensor 1)	Fully depressed	3.9 - 4.7V
98	Fully released	0.15 - 0.60V
(Accelerator pedal position sensor 2)	Fully depressed	1.95 - 2.40V



DTC P2122, P2123 APP SENSOR

[TYPE 2]

- If NG, replace accelerator pedal assembly and go to next step.
- Perform EC-692, "Accelerator Pedal Released Position Learning". 5.
- 6. Perform EC-692, "Throttle Valve Closed Position Learning".
- 7. Perform EC-692, "Idle Air Volume Learning".

Removal and Installation **ACCELERATOR PEDAL**

Refer to ACC-4, "ACCELERATOR CONTROL SYSTEM".



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DTC P2127, P2128 APP SENSOR

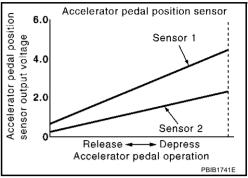
PFP:18002

Component Description

ABS008CI

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 potentiometers 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 feed 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 the engine operation such as fuel cut.

CONSULT-II Reference Value in Data Monitor Mode

ABS008CM

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
ACCEL SEN1	Ignition switch: ON	Accelerator pedal: Fully released	0.5 - 1.0V
ACCEL SENT	(Engine stopped)	Accelerator pedal: Fully depressed	4.0 - 4.7V
ACCEL SEN2*	Ignition switch: ON	Accelerator pedal: Fully released	0.3 - 1.2V
	(Engine stopped)	Accelerator pedal: Fully depressed	3.9 - 4.8V
CLSD THL POS	Ignition switch: ON	Accelerator pedal: Fully released	ON
CLOD THE POS	(Engine stopped)	Accelerator pedal: Slightly depressed	OFF

^{*:} Accelerator pedal position sensor 2 signal is converted by ECM internally. Thus, it differ from ECM terminal voltage.

On Board Diagnosis Logic

ABS00DA0

These self-diagnoses have the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P2127 2127	Accelerator pedal position 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.)
P2128 2128	Accelerator pedal position sensor 2 circuit high input	An excessively high voltage from the APP sensor 2 is sent to ECM.	 (TP sensor circuit is shorted.) Accelerator pedal position sensor (APP sensor 2) Electric throttle control actuator (TP sensor 1 and 2)

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Engine operating condition in fail-safe mode

ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees.

ECM regulates the opening speed of the throttle valve to be slower than the normal condition.

So, the acceleration will be poor.

DTC P2127, P2128 APP SENSOR

[TYPE 2]

DTC Confirmation Procedure

ABS00DA1

NOTE:

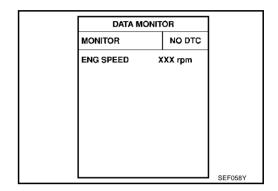
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

(II) WITH CONSULT-II

- Turn ignition switch ON.
- Select "DATA MONITOR" mode with CONSULT-II.
- 3. Start engine and let it idle for 1 second.
- 4. If DTC is detected, go to EC-1221, "Diagnostic Procedure".



WITH GST

Follow the procedure "With CONSULT-II" above.

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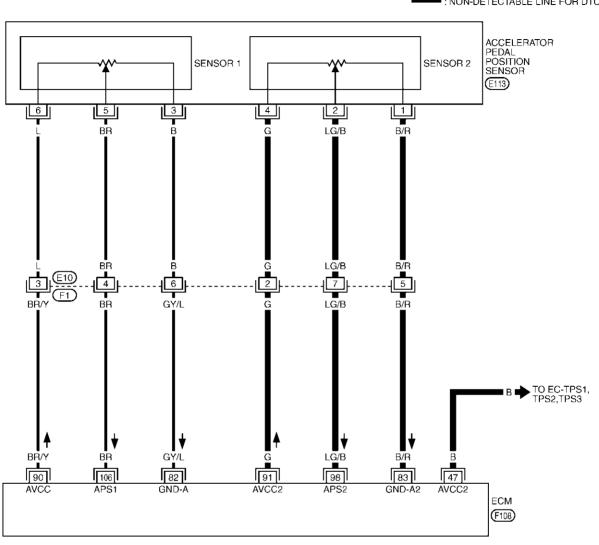
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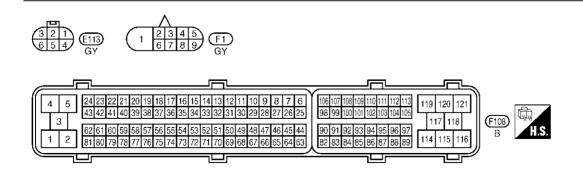
Wiring Diagram

ARSOODA?

EC-APPS2-01







TBWB0146E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

			-	<u>~</u>	
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)	EC
47	В	Sensors' power supply (Throttle position sensor)	[Ignition switch: ON]	Approximately 5V	С
82	GY/L	Sensors' ground (APP sensor 1)	[Engine is running]Warm-up conditionIdle speed	Approximately 0V	D
83	B/R	Sensors' ground (APP sensor 2)	[Engine is running]Warm-up conditionIdle speed	Approximately 0V	Е
90	BR/Y	Sensors' power supply (APP sensor 1)	[Ignition switch: ON]	Approximately 5V	F
91	G	Sensors' power supply (APP sensor 2)	[Ignition switch: ON]	Approximately 5V	
98	LG/B	Accelerator pedal position	[Ignition switch: ON]Engine stoppedAccelerator pedal fully released	0.15 - 0.60V	G H
90	LG/B	sensor 2	[Ignition switch: ON] • Engine stopped • Accelerator pedal fully depressed	1.95 - 2.40V	П
106 BR A	Accelerator pedal position	[Ignition switch: ON]Engine stoppedAccelerator pedal fully released	0.5 - 1.0V	J	
106	DK	sensor 1	[Ignition switch: ON] • Engine stopped • Accelerator pedal fully depressed	3.9 - 4.7V	K

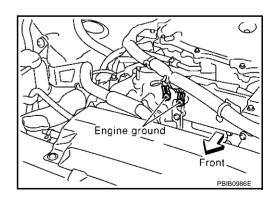
Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

Turn ignition switch OFF.

Loosen and retighten engine ground screws.

>> GO TO 2.



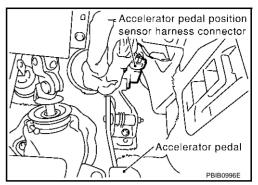
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$\overline{2}$. CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT-I

- Disconnect accelerator pedal position (APP) sensor harness connector.
- 2. Turn ignition switch ON.

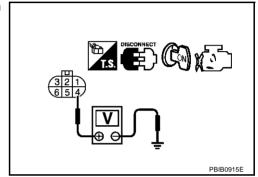


Check voltage between APP sensor terminal 4 and ground with CONSULT-II or tester.

Voltage: Approximately 5V

OK or NG

OK >> GO TO 8. NG >> GO TO 3.



3. CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT-II

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check harness continuity between APP sensor terminal 4 and ECM terminal 91. Refer to Wiring Diagram.

Continuity should exist.

OK or NG

OK >> GO TO 5. NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E10, F1
- Harness for open between ECM and accelerator pedal position sensor
 - >> Repair or replace open circuit.

5. CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT-III

Check harness for short to power and short to ground, between the following terminals.

ECM terminal	Sensor terminal	Reference Wiring Diagram
91	APP sensor terminal 4	EC-1220
47	Electric throttle control actuator terminal 1	EC-1227

OK or NG

OK >> GO TO 6.

NG >> Repair short to ground or short to power in harness or connectors.

DTC P2127, P2128 APP SENSOR

[TYPE 2]

	[111 - 2]
6. CHECK THROTTLE POSITION SENSOR	A
Refer to EC-1231, "Component Inspection".	
OK or NG OK >> GO TO 14.	EC
NG >> GO TO 14.	
7. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR	С
Replace the electric throttle control actuator.	
2. Perform EC-692, "Throttle Valve Closed Position Learning".	D
3. Perform EC-692, "Idle Air Volume Learning".	
>> INSPECTION END	Е
8. CHECK APP SENSOR 2 GROUND CIRCUIT FOR OPEN AND SHORT	
Turn ignition switch OFF.	F
2. Disconnect ECM harness connector.	
Check harness continuity between APP sensor terminal 1 and ECM terminal 83. Refer to Wiring Diagram.	G
Continuity should exist.	
4. Also check harness for short to ground and short to power.	Н
OK or NG	
OK >> GO TO 10. NG >> GO TO 9.	1
9. DETECT MALFUNCTIONING PART	
Check the following.	J
 Harness connectors E10, F1 	
 Harness for open or short between ECM and accelerator pedal position sensor 	K
>> Repair open circuit or short to ground or short to power in harness or connectors.	
10. CHECK APP SENSOR 2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT	L
Check harness continuity between ECM terminal 98 and APP sensor terminal 2. Refer to Wiring Diagram.	
Continuity should exist.	
2. Also check harness for short to ground and short to power.	
OK or NG	
OK >> GO TO 12. NG >> GO TO 11.	
11. DETECT MALFUNCTIONING PART	

Check the following.

- Harness connectors E10, F1
- Harness for open or short between ECM and accelerator pedal position sensor
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

$\overline{1}2$. check app sensor

Refer to EC-1224, "Component Inspection".

OK or NG

OK >> GO TO 14. NG >> GO TO 13.

13. REPLACE ACCELERATOR PEDAL ASSEMBLY

- 1. Replace the accelerator pedal assembly.
- 2. Perform EC-692, "Accelerator Pedal Released Position Learning".
- 3. Perform EC-692, "Throttle Valve Closed Position Learning".
- 4. Perform EC-692, "Idle Air Volume Learning".

>> INSPECTION END

14. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

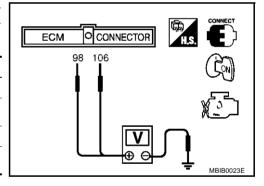
>> INSPECTION END

Component Inspection ACCELERATOR PEDAL POSITION SENSOR

ABS008CR

- 1. Reconnect all harness connectors disconnected.
- 2. Turn ignition switch ON.
- Check voltage between ECM terminals 106 (APP sensor 1 signal), 98 (APP sensor 2 signal) and engine ground under the following conditions.

Terminal	Accelerator pedal	Voltage
106	Fully released	0.5 - 1.0V
(Accelerator pedal position sensor 1)	Fully depressed	3.9 - 4.7V
98	Fully released	0.15 - 0.60V
(Accelerator pedal position sensor 2)	Fully depressed	1.95 - 2.40V



- 4. If NG, replace accelerator pedal assembly and go to next step.
- 5. Perform EC-692, "Accelerator Pedal Released Position Learning".
- 6. Perform EC-692, "Throttle Valve Closed Position Learning".
- 7. Perform EC-692, "Idle Air Volume Learning".

Removal and Installation ACCELERATOR PEDAL

ABS008CS

Refer to ACC-4, "ACCELERATOR CONTROL SYSTEM".

DTC P2135 TP SENSOR

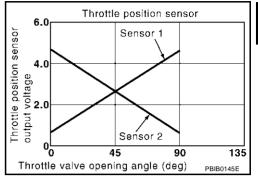
PFP:16119

Component Description

ABSOORCE

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 the 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.



CONSULT-II Reference Value in Data Monitor Mode

ABS008CU

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
THRTL SEN1 THRTL SEN2*	• Ignition switch: ON	Accelerator pedal: Fully released	More than 0.36V
	(Engine stopped) ■ Shift lever: D (A/T), 1st (M/T)	Accelerator pedal: Fully depressed	Less than 4.75V

^{*:} Throttle position sensor 2 signal is converted by ECM internally. Thus, it differs from ECM terminal voltage signal.

On Board Diagnosis Logic

ARSONDAA

This self-diagnosis has the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P2135 2135	Throttle position sensor circuit range/performance problem	Rationally incorrect voltage is sent to ECM compared with the signals from TP sensor 1 and TP sensor 2.	 Harness or connector (TP sensor 1 and 2 circuit is open or shorted.) (APP sensor 2 circuit is shorted.) Electric throttle control actuator (TP sensor 1 and 2) Accelerator pedal position sensor (APP sensor 2)

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode and the MIL lights up.

Engine operation condition in fail-safe mode

ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees.

ECM regulates the opening speed of the throttle valve to be slower than the normal condition.

So, the acceleration will be poor.

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DTC Confirmation Procedure

ARSONDA5

NOTE:

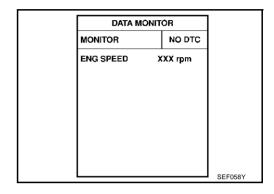
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

(P) WITH CONSULT-II

- 1. Turn ignition switch ON.
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- 3. Start engine and let it idle for 1 second.
- 4. If DTC is detected, go to EC-1228, "Diagnostic Procedure" .



WITH GST

Follow the procedure "WITH CONSULT-II" above.

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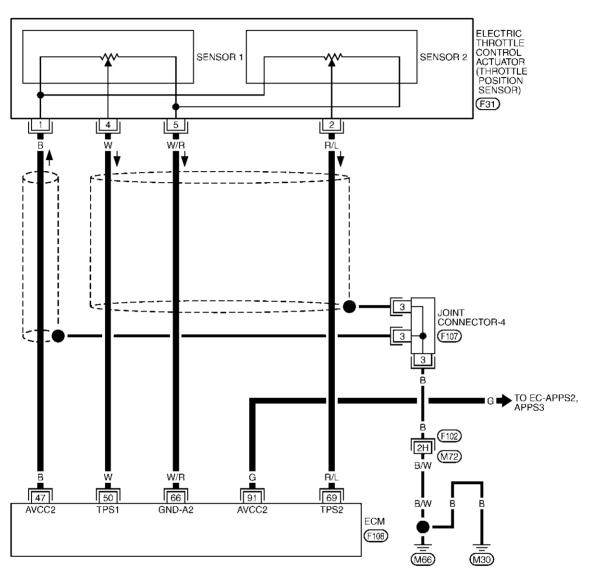
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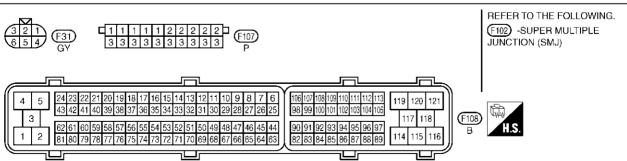
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EC-TPS3-01

■ : DETECTABLE LINE FOR DTC

■: NON-DETECTABLE LINE FOR DTC





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ABS00DA7

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
47	В	Sensors' power supply (Throttle position sensor)	[Ignition switch: ON]	Approximately 5V
	W		 [Ignition switch: ON] Engine stopped Shift lever: D (A/T) or 1st (M/T) Accelerator pedal fully released 	More than 0.36V
50	VV	Throttle position sensor 1	 [Ignition switch: ON] Engine stopped Shift lever: D (A/T) or 1st (M/T) Accelerator pedal fully depressed 	Less than 4.75V
66	W/R	Sensors' ground (Throttle position sensor)	[Engine is running]Warm-up conditionIdle speed	Approximately 0V
69	R/L		 [Ignition switch: ON] Engine stopped Shift lever: D (A/T) or 1st (M/T) Accelerator pedal fully released 	Less than 4.75V
33 TVL TITION	Throttle position sensor 2	 [Ignition switch: ON] Engine stopped Shift lever: D (A/T) or 1st (M/T) Accelerator pedal fully depressed 	More than 0.36V	
91	G	Sensors' power supply (APP sensor 2)	[Ignition switch: ON]	Approximately 5V

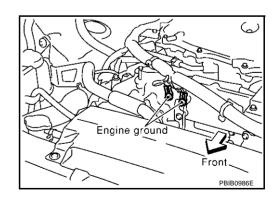
Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

Turn ignition switch OFF.

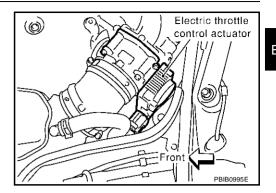
2. Loosen and retighten engine ground screws.

>> GO TO 2.



$\overline{2}$. CHECK THROTTLE POSITION SENSOR POWER SUPPLY CIRCUIT

- 1. Disconnect electric throttle control actuator harness connector.
- 2. Turn ignition switch ON.

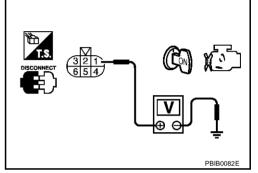


3. Check voltage between electric throttle control actuator terminal 1 and ground with CONSULT-II or tester.

Voltage: Approximately 5V

OK or NG

OK >> GO TO 7. NG >> GO TO 3.



3. CHECK THROTTLE POSITION SENSOR POWER SUPPLY CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check harness continuity between electric throttle control actuator terminal 1 and ECM terminal 47. Refer to Wiring Diagram.

Continuity should exist.

OK or NG

OK >> GO TO 4.

NG >> Repair or replace open circuit.

4. CHECK THROTTLE POSITION SENSOR POWER SUPPLY CIRCUIT

Check harness for short to power and short to ground, between the following terminals.

ECM terminal	Sensor terminal	Reference Wiring Diagram
47	Electric throttle control actuator terminal 1	EC-1227
91	APP sensor terminal 4	EC-1220

OK or NG

OK >> GO TO 5.

NG >> Repair short to ground or short to power in harness or connectors.

5. CHECK APP SENSOR

Refer to EC-1224, "Component Inspection".

OK or NG

OK >> GO TO 11. NG >> GO TO 6.

Revision; 2004 April **EC-1229** 2003 G35 Sedan

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6. REPLACE ACCELERATOR PEDAL ASSEMBLY

- 1. Replace the accelerator pedal assembly.
- 2. Perform EC-692, "Accelerator Pedal Released Position Learning".
- 3. Perform EC-692, "Throttle Valve Closed Position Learning".
- 4. Perform EC-692, "Idle Air Volume Learning".

>> INSPECTION END

7. CHECK THROTTLE POSITION SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check harness continuity between electric throttle control actuator terminal 5 and ECM terminal 66. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 8.

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

8. CHECK THROTTLE POSITION SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

 Check harness continuity between ECM terminal 50 and electric throttle control actuator terminal 4, ECM terminal 69 and electric throttle control actuator terminal 2. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 9.

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

9. CHECK THROTTLE POSITION SENSOR

Refer to EC-1231, "Component Inspection".

OK or NG

OK >> GO TO 11.

NG >> GO TO 10.

10. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

- 1. Replace the electric throttle control actuator.
- 2. Perform EC-692, "Throttle Valve Closed Position Learning".
- 3. Perform EC-692, "Idle Air Volume Learning".

>> INSPECTION END

11. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

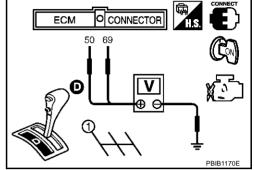
>> INSPECTION END

Component Inspection THROTTLE POSITION SENSOR

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- Reconnect all harness connectors disconnected.
- 2. Perform EC-692, "Throttle Valve Closed Position Learning".
- Turn ignition switch ON.
- 4. Set selector lever to D (A/T), 1st (M/T) position.
- Check voltage between ECM terminals 50 (TP sensor 1signal),
 (TP sensor 2signal) and engine ground under the following conditions.

Terminal	Accelerator pedal	Voltage
50	Fully released	More than 0.36V
(Throttle position sensor 1)	Fully depressed	Less than 4.75V
69	Fully released	Less than 4.75V
(Throttle position sensor 2)	Fully depressed	More than 0.36V



- 6. If NG, replace electric throttle control actuator and go to the next step.
- 7. Perform EC-692, "Throttle Valve Closed Position Learning".
- 8. Perform EC-692, "Idle Air Volume Learning".

Removal and Installation **ELECTRIC THROTTLE CONTROL ACTUATOR**

Refer to EM-18, "INTAKE MANIFOLD COLLECTOR".

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DTC P2138 APP SENSOR

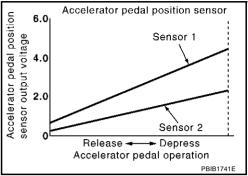
PFP:18002

Component Description

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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 potentiometers 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 feed 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 the engine operation such as fuel cut.

CONSULT-II Reference Value in Data Monitor Mode

ABS008D2

Specification data are reference values.

MONITOR ITEM	CON	SPECIFICATION	
ACCEL SEN1	Ignition switch: ON	Accelerator pedal: Fully released	0.5 - 1.0V
ACCEL SENT	(Engine stopped)	Accelerator pedal: Fully depressed	4.0 - 4.7V
ACCEL SEN2*	Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.3 - 1.2V
ACCEL SENZ		Accelerator pedal: Fully depressed	3.9 - 4.8V
CLSD THL POS	Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	ON
CLOD THE POS		Accelerator pedal: Slightly depressed	OFF

^{*:} Accelerator pedal position sensor 2 signal is converted by ECM internally. Thus, it differ from ECM terminal voltage.

On Board Diagnosis Logic

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This self-diagnosis has the one trip detection logic.

NOTE

If DTC P2138 is displayed with DTC P1229, first perform the trouble diagnosis for DTC P1229. Refer to <u>EC-1151</u>.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P2138 2138	Accelerator pedal position sensor circuit range/performance problem	Rationally incorrect voltage is sent to ECM compared with the signals from APP sensor 1 and APP sensor 2.	 Harness or connector (APP sensor 1 and 2 circuit is open or shorted.) (TP sensor circuit is shorted.) Accelerator pedal position sensor (APP sensor 1 and 2) Electric throttle control actuator (TP sensor 1 and 2)

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Engine operating condition in fail-safe mode

ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees.

ECM regulates the opening speed of the throttle valve to be slower than the normal condition.

So, the acceleration will be poor.

DTC P2138 APP SENSOR

[TYPE 2]

DTC Confirmation Procedure

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NOTE:

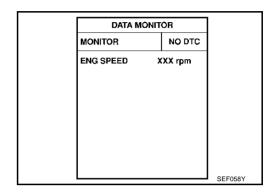
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

(II) WITH CONSULT-II

- 1. Turn ignition switch ON.
- 2. Select "DATA MONITOR" mode with CONSULT-II.
- 3. Start engine and let it idle for 1 second.
- 4. If DTC is detected, go to EC-1235, "Diagnostic Procedure".



WITH GST

Follow the procedure "WITH CONSULT-II" above.

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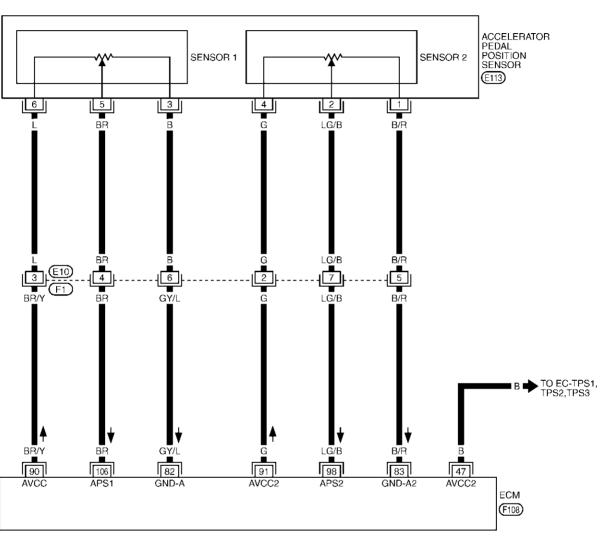
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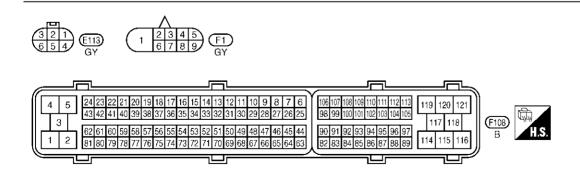
Wiring Diagram

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EC-APPS3-01







TBWB0147E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)	EC
47	В	Sensors' power supply (Throttle position sensor)	[Ignition switch: ON]	Approximately 5V	С
82	GY/L	Sensors' ground (APP sensor 1)	[Engine is running]Warm-up conditionIdle speed	Approximately 0V	D
83	B/R	Sensors' ground (APP sensor 2)	[Engine is running]Warm-up conditionIdle speed	Approximately 0V	Е
90	BR/Y	Sensors' power supply (APP sensor 1)	[Ignition switch: ON]	Approximately 5V	F
91	G	Sensors' power supply (APP sensor 2)	[Ignition switch: ON]	Approximately 5V	-
00	I C/D	Accelerator pedal position	[Ignition switch: ON]Engine stoppedAccelerator pedal fully released	0.15 - 0.60V	G H
98 LG/B	sensor 2	[Ignition switch: ON]Engine stoppedAccelerator pedal fully depressed	1.95 - 2.40V	П	
106	DD	Accelerator pedal position	[Ignition switch: ON]Engine stoppedAccelerator pedal fully released	0.5 - 1.0V	J
106 BR	R sensor 1	[Ignition switch: ON] • Engine stopped • Accelerator pedal fully depressed	3.9 - 4.7V	K	

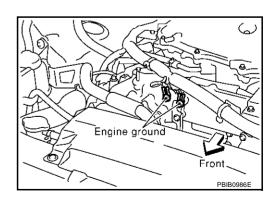
Diagnostic Procedure

1. RETIGHTEN GROUND SCREWS

Turn ignition switch OFF.

Loosen and retighten engine ground screws.

>> GO TO 2.



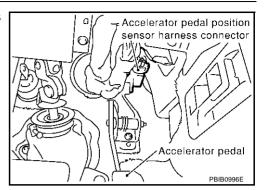
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$\overline{2}$. CHECK APP SENSOR 1 POWER SUPPLY CIRCUIT

- Disconnect accelerator pedal position (APP) sensor harness connector.
- 2. Turn ignition switch ON.

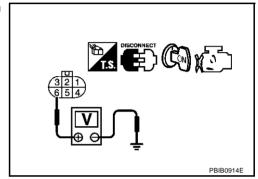


3. Check voltage between APP sensor terminal 6 and ground with CONSULT-II or tester.

Voltage: Approximately 5V

OK or NG

OK >> GO TO 4. NG >> GO TO 3.



3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E10, F1
- Harness for open or short between ECM and accelerator pedal position sensor
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

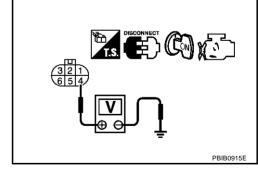
4. CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT-I

Check voltage between APP sensor terminal 4 and ground with CONSULT-II or tester.

Voltage: Approximately 5V

OK or NG

OK >> GO TO 10. NG >> GO TO 5.



DTC P2138 APP SENSOR

[TYPE 2]

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5. CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT-II

- Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check harness continuity between APP sensor terminal 4 and ECM terminal 91. Refer to Wiring Diagram.

Continuity should exist.

OK or NG

OK >> GO TO 7. NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E10, F1
- Harness for open between ECM and accelerator pedal position sensor

>> Repair or replace open circuit.

7. CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT-III

Check harness for short to power and short to ground, between the following terminals.

ECM terminal	Sensor terminal	Reference Wiring Diagram
91	APP sensor terminal 4	EC-1234
47	47 Electric throttle control actuator terminal 1	

OK or NG

OK >> GO TO 8.

NG >> Repair short to ground or short to power in harness or connectors.

8. CHECK THROTTLE POSITION SENSOR

Refer to EC-1231, "Component Inspection".

OK or NG

OK >> GO TO 16.

NG >> GO TO 9

9. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

- 1. Replace the electric throttle control actuator.
- 2. Perform EC-692, "Throttle Valve Closed Position Learning".
- 3. Perform EC-692, "Idle Air Volume Learning".

>> INSPECTION END

Revision; 2004 April **EC-1237** 2003 G35 Sedan

10. CHECK APP SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check harness continuity between APP sensor terminal 1 and ECM terminal 83, APP sensor terminal 3 and ECM terminal 82.
 Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

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OK >> GO TO 12.
NG >> GO TO 11.
```

11. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E10, F1
- Harness for open or short between ECM and accelerator pedal position sensor
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

12. CHECK APP SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

 Check harness continuity between ECM terminal 106 and APP sensor terminal 5, ECM terminal 98 and APP sensor terminal 2. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

```
OK >> GO TO 14.
NG >> GO TO 13.
```

13. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E10, F1
- Harness for open or short between ECM and accelerator pedal position sensor
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

14. CHECK APP SENSOR

Refer to EC-1240, "Component Inspection".

OK or NG

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OK >> GO TO 16.
NG >> GO TO 15.
```

DTC P2138 APP SENSOR

[TYPE 2]

15. REPLACE ACCELERATOR PEDAL ASSEMBLY

- 1. Replace the accelerator pedal assembly.
- 2. Perform EC-692, "Accelerator Pedal Released Position Learning" .
- 3. Perform EC-692, "Throttle Valve Closed Position Learning".
- 4. Perform EC-692, "Idle Air Volume Learning".

>> INSPECTION END

16. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

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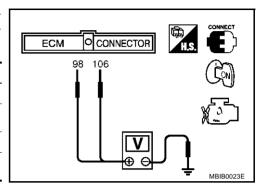
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Component Inspection ACCELERATOR PEDAL POSITION SENSOR

ABS008D7

- 1. Reconnect all harness connectors disconnected.
- 2. Turn ignition switch ON.
- Check voltage between ECM terminals 106 (APP sensor 1 signal), 98 (APP sensor 2 signal) and engine ground under the following conditions.

Terminal	Accelerator pedal	Voltage
106	Fully released	0.5 - 1.0V
(Accelerator pedal position sensor 1)	Fully depressed	3.9 - 4.7V
98	Fully released	0.15 - 0.60V
(Accelerator pedal position sensor 2)	Fully depressed	1.95 - 2.40V



- 4. If NG, replace accelerator pedal assembly and go to next step.
- 5. Perform EC-692, "Accelerator Pedal Released Position Learning".
- 6. Perform EC-692, "Throttle Valve Closed Position Learning".
- 7. Perform EC-692, "Idle Air Volume Learning".

Removal and Installation ACCELERATOR PEDAL

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Refer to ACC-4, "ACCELERATOR CONTROL SYSTEM".

IGNITION SIGNAL

[TYPE 2]

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PBIB1007E

IGNITION SIGNAL

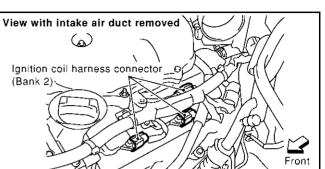
Component Description IGNITION COIL & POWER TRANSISTOR

Ignition coil harness connector

(Bank 1) {{\}}

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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.



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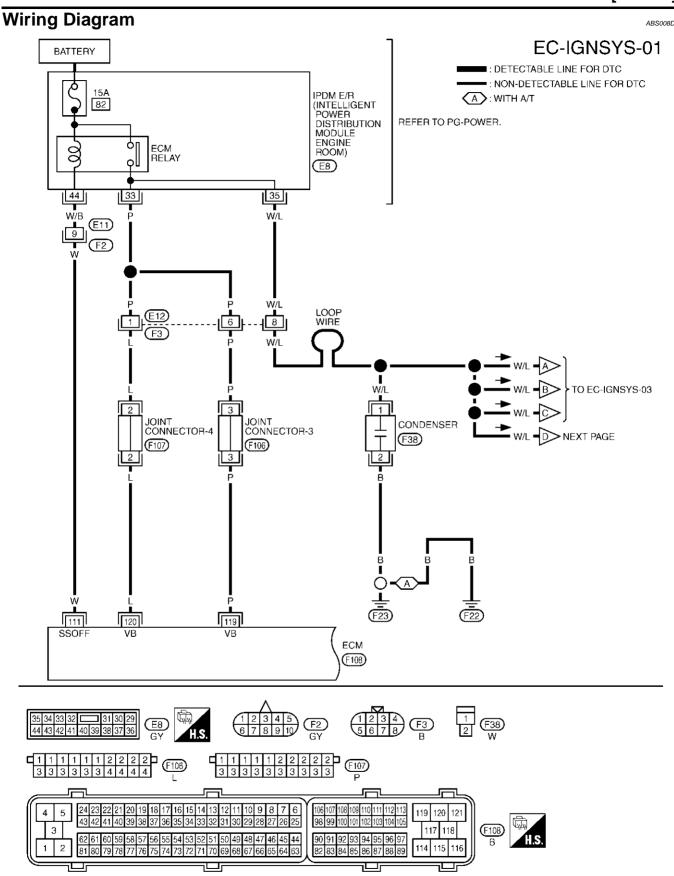
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IGNITION SIGNAL

[TYPE 2]

Specification data are reference values and are measured between each terminal and ground. Pulse signal is measured by CONSULT-II.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
111 VV	W	ECM relay	[Engine is running][Ignition switch: OFF]For a few seconds after turning ignition switch OFF	0 - 1.5V
	(Self shut-off)	[Ignition switch: OFF] • A few seconds passed after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)	
119 120	P L	Power supply for ECM	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14V)

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EC-IGNSYS-02 ■: DETECTABLE LINE FOR DTC : NON-DETECTABLE LINE FOR DTC A: WITH A/T **ECM** (F108) IGN#1 IGN#3 IGN#5 61 60 62 PU/W Y/R PRE-CEDING D W/L PAGE W/L 2 L/R 5 3 W/L LOOP W/L W/L 3 3 IGNITION COIL NO.1 (WITH IGNITION COIL NO.5 (WITH IGNITION COIL NO.3 (WITH POWER POWER TRANSISTOR) **POWER** TRANSISTOR) TRANSISTOR) ~ ത്ത ത്ത (F203) (F202) (F15) [2 2 SPARK PLUG SPARK PLUG SPARK PLUG B **-**1 **-** B (F201) (F18) (F22) 3 2 1 (F15), (F202), (F203) GY GY GY 119 120 121 5 3 117 118 (F108) 90 91 92 93 94 95 96 97 82 83 84 85 86 87 88 89 81 80 79 78 77 76 75 74 73 72 71 70 69 68 67 66 65 64 63

TBWT0462E

IGNITION SIGNAL

[TYPE 2]

Specification data are reference values and are measured between each terminal and ground. Pulse signal is measured by CONSULT-II.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
60 PU/W		Ignition signal No. 5	[Engine is running] • Warm-up condition • Idle speed	0 - 0.2V*
61 62	L/R Y/R	Ignition signal No. 3 Ignition signal No. 1	 [Engine is running] Warm-up condition Engine speed is 2,500 rpm. 	0.1 - 0.4V★

^{★:} Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

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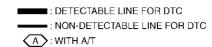
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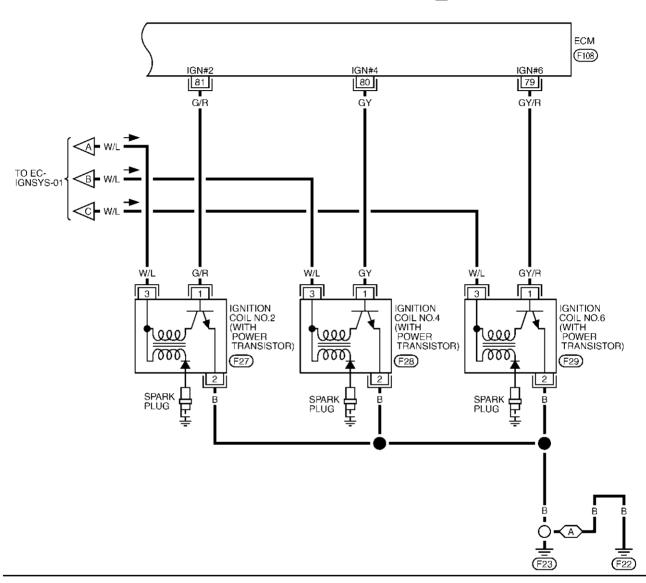
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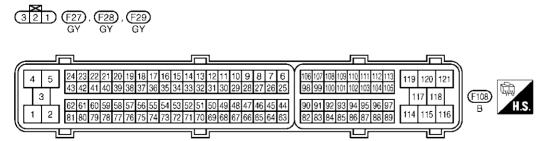
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EC-IGNSYS-03







TBWT0463E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

		<u> </u>	<u> </u>	
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
79 GY/R 80 GY		Ignition signal No. 6	[Engine is running] • Warm-up condition • Idle speed	0 - 0.2V*
81	80 GY Ignition signal No. 4	 [Engine is running] Warm-up condition Engine speed is 2,500 rpm. 	0.1 - 0.4V★	

^{★:} Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

1. CHECK ENGINE START

Turn ignition switch OFF, and restart engine.

Is engine running?

Yes or No

Yes (With CONSULT-II)>>GO TO 2. Yes (Without CONSULT-II)>>GO TO 3.

No >> GO TO 4.

2. CHECK OVERALL FUNCTION

(II) With CONSULT-II

- Perform "POWER BALANCE" in "ACTIVE TEST" mode with CONSULT-II.
- 2. Make sure that each circuit produces a momentary engine speed drop.

OK or NG

OK >> INSPECTION END

NG >> GO TO 10.

ACTIVE TES		
POWER BALANCE		
MONITOR		
ENG SPEED	XXX rpm	
MAS A/F SE-B1	XXX V	
		PBIB0133E

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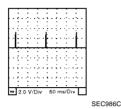
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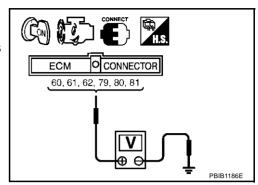
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$\overline{3}$. CHECK OVERALL FUNCTION

W Without CONSULT-II

- 1. Let engine idle.
- 2. Read the voltage signal between ECM terminals 60, 61, 62, 79, 80, 81 and ground with an oscilloscope.
- 3. Verify that the oscilloscope screen shows the signal wave as shown below.





OK or NG

OK >> INSPECTION END

NG >> GO TO 10.

4. CHECK IGNITION COIL POWER SUPPLY CIRCUIT-I

- 1. Turn ignition switch OFF, wait at least 10 seconds and then turn ON.
- 2. Check voltage between ECM terminals 119, 120 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 5.

NG >> Go to EC-781, "POWER SUPPLY CIRCUIT FOR ECM"

ECM O CONNECTOR

119, 120

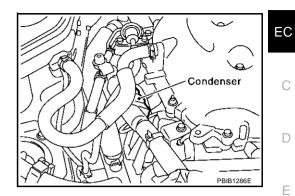
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5. CHECK IGNITION COIL POWER SUPPLY CIRCUIT-II

- 1. Turn ignition switch OFF.
- 2. Disconnect condenser harness connector.

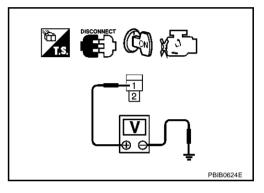


- Turn ignition switch ON.
- Check voltage between condenser terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 8. NG >> GO TO 6.



6. CHECK IGNITION COIL POWER SUPPLY CIRCUIT-III

- 1. Turn ignition switch OFF.
- 2. Disconnect IPDM E/R harness connector E8.
- Check harness continuity between IPDM E/R terminal 35 and condenser terminal 1. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 17. NG >> GO TO 7.

7. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Harness for open or short between IPDM E/R and condenser
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

8. CHECK CONDENSER GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Check harness continuity between condenser terminal 2 and engine ground. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 9.

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

9. CHECK CONDENSER

Refer to EC-1252, "Component Inspection".

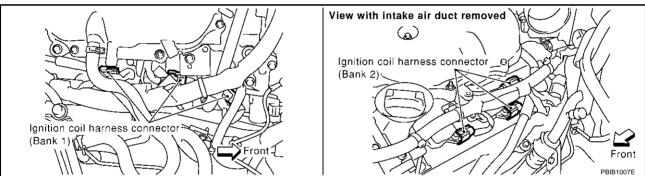
OK or NG

OK >> GO TO 10.

NG >> Replace condenser.

10. CHECK IGNITION COIL POWER SUPPLY CIRCUIT-V

- 1. Turn ignition switch OFF.
- 2. Reconnect all harness connectors disconnected.
- Disconnect ignition coil harness connector.

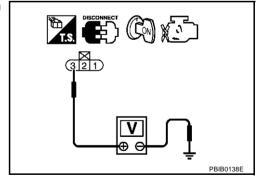


- 4. Turn ignition switch ON.
- Check voltage between ignition coil terminal 3 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 12. NG >> GO TO 11.



11. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F18, F201
- Harness for open or short between ignition coil and harness connector F3
 - >> Repair or replace harness or connectors.

ITYPE 21

$\overline{12}$. CHECK IGNITION COIL GROUND CIRCUIT FOR OPEN AND SHORT Turn ignition switch OFF. Check harness continuity between ignition coil terminal 2 and engine ground. EC Refer to Wiring Diagram. Continuity should exist. 3. Also check harness for short to power. OK or NG >> GO TO 14. OK NG >> GO TO 13. 13. DETECT MALFUNCTIONING PART F Check the following. Harness connectors F18, F201 Harness for open or short between ignition coil and engine ground >> Repair open circuit or short to power in harness or connectors. 14. check ignition coil output signal circuit for open and short Disconnect ECM harness connector. Н Check harness continuity between ECM terminals 60, 61, 62, 79, 80, 81 and ignition coil terminal 1. Refer to Wiring Diagram. Continuity should exist. 3. Also check harness for short to ground and short to power. OK or NG OK >> GO TO 16. NG >> GO TO 15. 15. DETECT MALFUNCTIONING PART Check the following. Harness connectors F18, F201 Harness for open or short between ignition coil and ECM >> Repair open circuit or short to ground or short to power in harness or connectors. M 16. CHECK IGNITION COIL WITH POWER TRANSISTOR Refer to EC-1252, "Component Inspection". OK or NG OK >> GO TO 17. NG >> Replace ignition coil with power transistor.

17. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

OK or NG

>> Replace IPDM E/R. refer to PG-16. OK

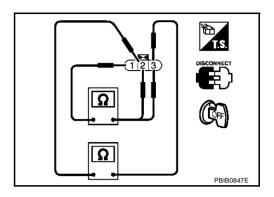
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

Component Inspection IGNITION COIL WITH POWER TRANSISTOR

ABS008DC

- 1. Turn ignition switch OFF.
- 2. Disconnect ignition coil harness connector.
- 3. Check resistance between ignition coil terminals as follows.

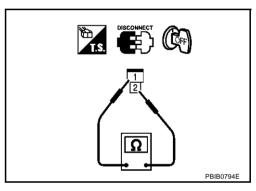
Terminal No. (Polarity)	Resistance Ω [at 25°C (77°F)]
1 and 2	Except 0 or ∞
1 and 3	Event 0
2 and 3	Except 0



CONDENSER

- 1. Turn ignition switch OFF.
- 2. Disconnect condenser harness connector.
- 3. Check resistance between condenser terminals 1 and 2.

Resistance Above 1 MΩ at 25°C (77°F)	Resistance	Above 1 MΩ at 25°C (77°F)
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ABS008DD

Removal and Installation IGNITION COIL WITH POWER TRANSISTOR

Refer to EM-34, "IGNITION COIL".

[TYPE 2]

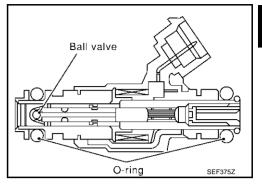
INJECTOR CIRCUIT

Component Description

PFP:16600

ARSOORDE

The fuel injector is a small, precise solenoid valve. When the ECM supplies a ground to the injector circuit, the coil in the injector is energized. The energized coil pulls the needle valve back and allows fuel to flow through the injector into the intake manifold. The amount of fuel injected depends upon the injection pulse duration. Pulse duration is the length of time the injector remains open. The ECM controls the injection pulse duration based on engine fuel needs.



CONSULT-II Reference Value in Data Monitor Mode

ARSONADE

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
	Engine: After warming up	Idle	2.5 - 3.5 msec
B/FUEL SCHDL	• Shift lever: N (A/T), Neutral (M/T)		
B/FUEL SCHDL	Air conditioner switch: OFF	2,000 rpm	2.5 - 3.5 msec
	No-load		
	Engine: After warming up	Idle	2.0 - 3.0 msec
INJ PULSE-B1	• Shift lever: N (A/T), Neutral (M/T)		
INJ PULSE-B2	Air conditioner switch: OFF	2,000 rpm	1.9 - 2.9 msec
	No-load		

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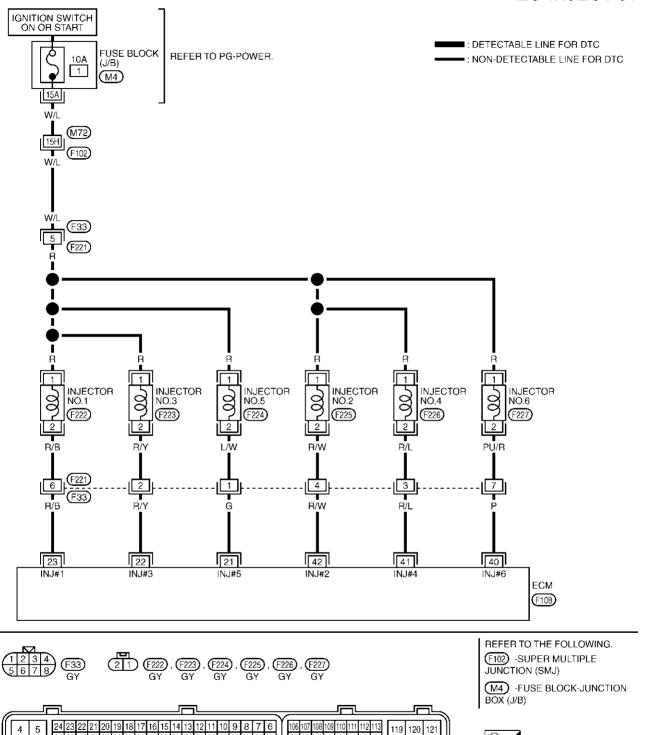
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Wiring Diagram

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RSOORDG

EC-INJECT-01



TBWT0301E

98 99 100 101 102 103 104 105

117 118

114 115

(F108)

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Specification data are reference values and are measured between each terminal and ground. Pulse signal is measured by CONSULT-II.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Volta	ge)
21 G 22 R/Y 23 R/B	Injector No. 5	[Engine is running] • Warm-up condition • Idle speed	BATTERY VOLTAGE (11 - 14V)*	D E	
		njector No. 3 njector No. 1	[Engine is running] • Warm-up condition • Engine speed is 2,000 rpm	BATTERY VOLTAGE (11 - 14V)*	G H
40	P	Injector No. 6	[Engine is running]Warm-up conditionIdle speed	BATTERY VOLTAGE (11 - 14V)*	J SEC984C K
41 42	R/L R/W	Injector No. 4 Injector No. 2	[Engine is running] ■ Warm-up condition ■ Engine speed is 2,000 rpm	BATTERY VOLTAGE (11 - 14V)*	L
					SEC985C

^{★:} Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

ABS008DH

Diagnostic Procedure

1. INSPECTION START

Turn ignition switch to START.

Is any cylinder ignited?

Yes or No

Yes >> GO TO 2. No >> GO TO 3.

2. CHECK OVERALL FUNCTION

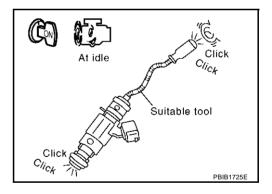
(P) With CONSULT-II

- 1. Start engine.
- 2. Perform "POWER BALANCE" in "ACTIVE TEST" mode with CONSULT-II.
- 3. Make sure that each circuit produces a momentary engine speed drop.

ACTIVE TES	ST .	
POWER BALANCE		
MONITOR		
ENG SPEED	XXX rpm	
MAS A/F SE-B1	XXX V	
	1	
		PBIB01:

(R) Without CONSULT-II

- 1. Start engine.
- 2. Listen to each injector operating sound. Clicking noise should be heard.



OK or NG

OK >> INSPECTION END

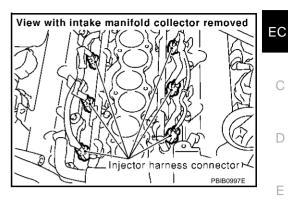
NG >> GO TO 3.

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3. CHECK INJECTOR POWER SUPPLY CIRCUIT

- Turn ignition switch OFF.
- 2. Disconnect injector harness connector.
- Turn ignition switch ON.

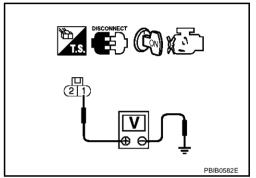


Check voltage between injector terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 5. NG >> GO TO 4.



4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M72, F102
- Harness connectors F33, F221
- Fuse block (J/B) connector M4
- 10A fuse
- Harness for open or short between injector and fuse

>> Repair harness or connectors.

5. CHECK INJECTOR OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF. 1.
- Disconnect ECM harness connector.
- Check harness continuity between injector terminal 2 and ECM terminals 21, 22, 23, 40, 41, 42. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 7. NG >> GO TO 6.

EC-1257 2003 G35 Sedan Revision; 2004 April

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F33, F221
- Harness for open or short between injector and ECM
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK INJECTOR

Refer to EC-1258, "Component Inspection".

OK or NG

OK >> GO TO 8.

NG >> Replace injector.

8. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

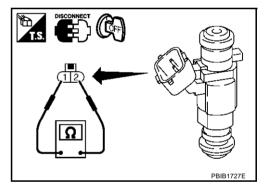
>> INSPECTION END

Component Inspection INJECTOR

ABS008DI

- 1. Disconnect injector harness connector.
- 2. Check resistance between terminals as shown in the figure.

Resistance: $13.5 - 17.5\Omega$ [at $10 - 60^{\circ}$ C ($50 - 140^{\circ}$ F)]



Removal and Installation INJECTOR

Refer to EM-37, "FUEL INJECTOR AND FUEL TUBE".

ABS008DJ

FUEL PUMP CIRCUIT

[TYPE 2]

FUEL PUMP CIRCUIT

PFP:17042

Description SYSTEM DESCRIPTION

ABS008DK

Sensor	Input Signal to ECM	ECM Function	Actuator
Crankshaft position sensor (POS) Camshaft position sensor (PHASE)	Engine speed*	Fuel pump control	Fuel pump relay
Battery	Battery voltage*		

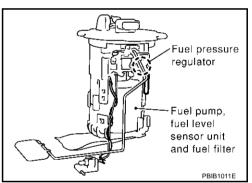
^{*:} ECM determines the start signal status by the signals of engine speed and battery voltage.

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 (PHASE), 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 DESCRIPTION

A turbine type design fuel pump is used in the furl tank.



CONSULT-II Reference Value in Data Monitor Mode

ABS008DL

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
FUEL PUMP RLY	For 1 second after turning ignition switch ONEngine running or cranking	ON
	Except above conditions	OFF

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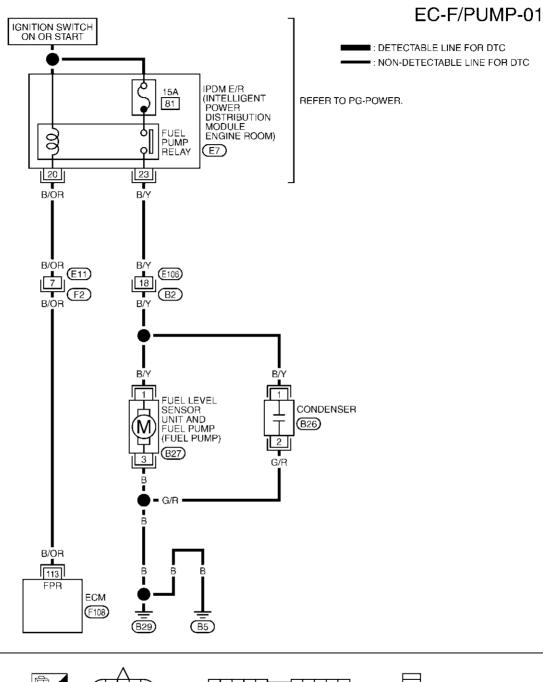
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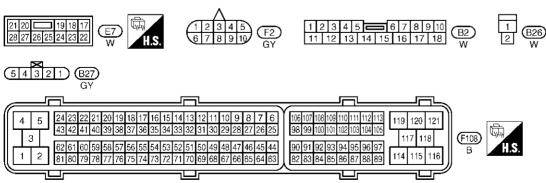
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Wiring Diagram

ABS008DN





TBWT0436E

FUEL PUMP CIRCUIT

[TYPE 2]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
113	B/OR	Fuel pump relay	[Ignition switch: ON]● For 1 second after turning ignition switch ON[Engine is running]	0 - 1.5V
113	2,010	Tuoi pamp rolay	[Ignition switch: ON] ■ More than 1 second after turning ignition switch ON.	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

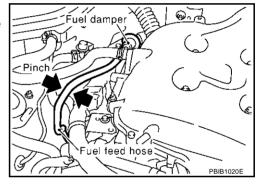
1. CHECK OVERALL FUNCTION

- 1. Turn ignition switch ON.
- Pinch fuel feed hose with two fingers.
 Fuel pressure pulsation should be felt on the fuel feed hose for 1 second after ignition switch is turned "ON".

OK or NG

OK >> INSPECTION END

NG >> GO TO 2.



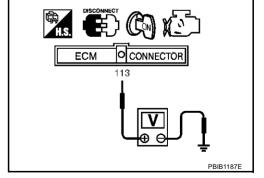
2. CHECK FUEL PUMP POWER SUPPLY CIRCUIT-I

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Turn ignition switch ON.
- 4. Check voltage between ECM terminal 113 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 5. NG >> GO TO 3.



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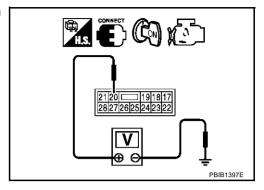
3. CHECK FUEL PUMP POWER SUPPLY CIRCUIT-I

- 1. Turn ignition switch ON.
- 2. Check voltage between IPDM E/R terminal 20 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 4. NG >> GO TO 12.



4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E11. F2
- Harness for open or short between IPDM E/R and ECM
 - >> Repair harness or connectors.

5. CHECK CONDENSER POWER SUPPLY CIRCUIT-I

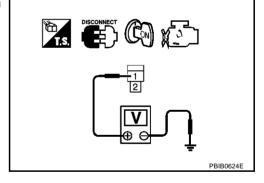
- 1. Turn ignition switch OFF.
- 2. Reconnect all harness connectors disconnected.
- 3. Disconnect condenser harness connector.
- Turn ignition switch ON.
- Check voltage between condenser terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage should exist for 1 second after ignition switch is turned ON.

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

OK or NG

OK >> GO TO 9. NG >> GO TO 6.



6. CHECK 15A FUSE

- 1. Turn ignition switch OFF.
- Disconnect 15A fuse.
- 3. Check 15A fuse.

OK or NG

OK >> GO TO 7. NG >> Replace fuse.

ITYPE 21

7. CHECK CONDENSER POWER SUPPLY CIRCUIT-II

- Disconnect IPDM E/R harness connector E7. 1.
- Check harness continuity between IPDM E/R terminal 23 and condenser terminal 1. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 12. NG >> GO TO 8.

8. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E106, B2
- Harness for open or short between IPDM E/R and condenser
 - >> Repair harness or connectors.

9. CHECK CONDENSER GROUND CIRCUIT

Check harness continuity between condenser terminal 2 and ground. Refer to Wiring Diagram.

Continuity should exist.

2. Also check harness for short to power.

OK or NG

>> GO TO 10. OK

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

10. CHECK CONDENSER

Refer to EC-1264, "Component Inspection".

OK or NG

OK >> GO TO 11.

NG >> Replace condenser.

11. CHECK FUEL PUMP POWER SUPPLU AND GROUND CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- 2. Disconnect "fuel level sensor unit and fuel pump" harness con-
- Check harness continuity between "fuel level sensor unit and fuel pump" terminal 1 and harness connector B2 terminal 18. "fuel level sensor unit and fuel pump" terminal 3 and ground. Refer to Wiring Diagram.

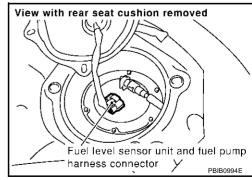
Continuity should exist.

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

OK or NG

OK >> GO TO 12.

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



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12. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

OK or NG

OK >> Replace IPDM E/R.

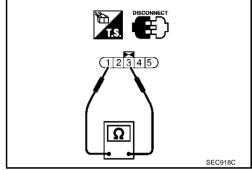
NG >> Repair or replace harness or connectors.

Component Inspection FUEL PUMP

ABS008DO

- 1. Disconnect fuel level sensor unit and fuel pump harness connector.
- 2. Check resistance between fuel level sensor unit and fuel pump terminals 1 and 3.

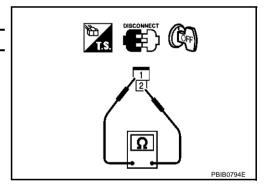
Resistance: Approximately 1.0 Ω [at 25°C (77°F)]



CONDENSER

- Turn ignition switch OFF.
- 2. Disconnect condenser harness connector.
- 3. Check resistance between condenser terminals as 1 and 2.

Resistance	Above 1 MΩ at 25°C (77°F)
Resistance	Above 1 MΩ at 25°C (77°F)



Removal and Installation FUEL PUMP

ABS008DP

Refer to FL-5, "FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY" .

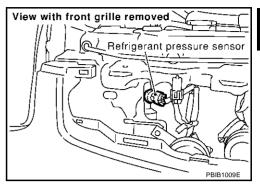
REFRIGERANT PRESSURE SENSOR

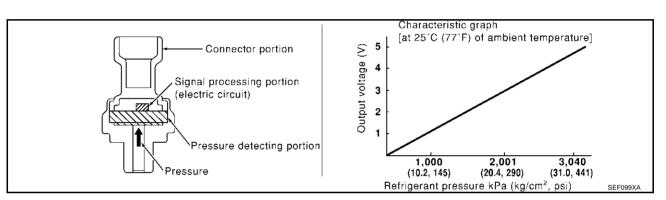
PFP:92136

Component Description

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The refrigerant pressure sensor is installed at the liquid tank 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.





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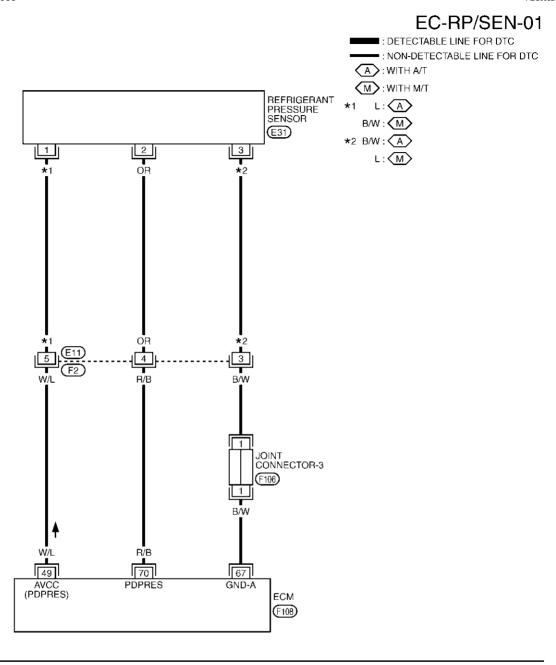
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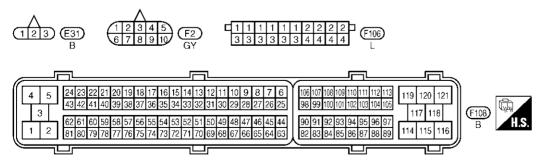
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Wiring Diagram





TBWT0464E

REFRIGERANT PRESSURE SENSOR

[TYPE 2]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
49	W/L	Sensors' power supply (Refrigerant pressure sensor)	[Ignition switch: ON]	Approximately 5V
67	B/W	Sensors' ground (Mass air flow sensor / IAT sensor / Power steering pressure sensor / EVAP control system pressure sensor)	[Engine is running] • Warm-up condition • Idle speed	Approximately 0V
70	R/B	Refrigerant pressure sensor	 [Engine is running] Warm-up condition Both A/C switch and blower switch are ON. (Compressor operates.) 	1.0 - 4.0V

Diagnostic Procedure

1. CHECK REFRIGERANT PRESSURE SENSOR OVERALL FUNCTION

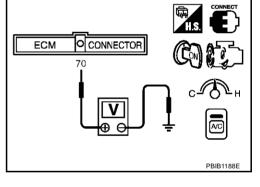
- 1. Start engine and warm it up to normal operating temperature.
- 2. Turn A/C switch and blower switch ON.
- 3. Check voltage between ECM terminal 70 and ground with CON-SULT-II or tester.

Voltage: 1.0 - 4.0V

OK or NG

OK >> INSPECTION END

NG >> GO TO 2.



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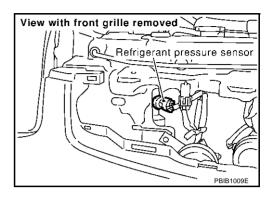
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$\overline{2}$. Check refrigerant pressure sensor power supply circuit

- 1. Turn A/C switch and blower switch OFF.
- 2. Stop engine.
- 3. Disconnect refrigerant pressure sensor harness connector.
- 4. Turn ignition switch ON.

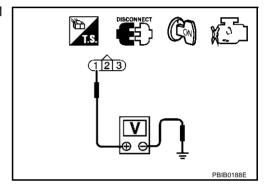


5. Check voltage between refrigerant pressure sensor terminal 1 and ground with CONSULT-II or tester.

Voltage: Approximately 5V

OK or NG

OK >> GO TO 4. NG >> GO TO 3.



3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E11, F2
- Harness for open or short between ECM and refrigerant pressure sensor
 - >> Repair harness or connectors.

4. CHECK REFRIGERANT PRESSURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- Disconnect ECM harness connector.
- 3. Check harness continuity between refrigerant pressure sensor terminal 3 and ECM terminal 67. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 6. NG >> GO TO 5.

REFRIGERANT PRESSURE SENSOR

[TYPE 2]

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5. DETECT MALFUNCTIONING PART	^
Check the following.	_ ^
 Harness connectors E11, F2 	
Joint connector-3	EC
Harness for open or short between ECM and refrigerant pressure sensor	
>> Repair open circuit or short to ground or short to power in harness or connectors.	С
6. CHECK REFRIGERANT PRESSURE SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT	D
Check harness continuity between ECM terminal 70 and refrigerant pressure sensor terminal 2. Refer to Wiring Diagram.	- U
Continuity should exist.	Е
2. Also check harness for short to ground and short to power.	
OK or NG	F
OK >> GO TO 8. NG >> GO TO 7.	
_	
7. DETECT MALFUNCTIONING PART	G
Check the following.	_
Harness connectors E11, F2	Н
Harness for open or short between ECM and refrigerant pressure sensor	
>> Repair open circuit or short to ground or short to power in harness or connectors.	1
8. CHECK INTERMITTENT INCIDENT	
Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".	- J
OK or NG	
OK >> Replace refrigerant pressure sensor. NG >> Repair or replace.	K
Removal and Installation REFRIGERANT PRESSURE SENSOR)T L
Refer to ATC-166, "Removal and Installation of Refrigerant Pressure Sensor".	

Revision; 2004 April **EC-1269** 2003 G35 Sedan

[TYPE 2]

ELECTRICAL LOAD SIGNAL

PFP:25350

Description

ARSONRDI

The electrical load signal (Headlamp switch signal, rear window defogger switch signal, etc.) is transferred through the CAN communication line from BCM to ECM via IPDM E/R.

CONSULT-II Reference Value in Data Monitor Mode

ABS008DV

Specification data are reference values.

MONITOR ITEM	COI	NDITION	SPECIFICATION
LOAD SIGNAL	Ignition switch: ON	Rear window defogger switch is ON and/or lighting switch is in 2nd.	ON
LOAD GIGNAL	• Igridon Switch. ON	Rear window defogger switch is OFF and lighting switch is OFF.	OFF

Diagnostic Procedure

ABS008DW

1. CHECK LOAD SIGNAL CIRCUIT OVERALL FUNCTION-I

- 1. Turn ignition switch ON.
- 2. Connect CONSULT-II and select "DATA MONITOR" mode.
- Select "LOAD SIGNAL" and check indication under the following conditions.

Condition	Indication
Rear window defogger switch ON	ON
Rear window defogger switch OFF	OFF

DATA MONITOR MONITORING NO DTC LOAD SIGNAL ON PBIB0103E

OK or NG

OK >> GO TO 2. NG >> GO TO 3.

2. CHECK LOAD SIGNAL CIRCUIT OVERALL FUNCTION-II

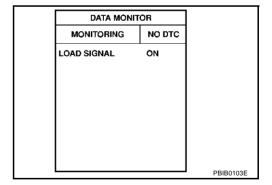
Check "LOAD SIGNAL" indication under the following conditions.

Condition	Indication
Lighting switch ON at 2nd position	ON
Lighting switch OFF	OFF

OK or NG

OK >> INSPECTION END

NG >> GO TO 4.



3. CHECK REAR WINDOW DEFOGGER SYSTEM

Refer to GW-99, "REAR WINDOW DEFOGGER".

>> INSPECTION END

4. CHECK HEADLAMP SYSTEM

Refer to LT-7, "HEADLAMP (FOR USA)" or LT-33, "HEADLAMP (FOR CANADA) - DAYTIME LIGHT SYSTEM -" .

>> INSPECTION END

[TYPE 2]

ASCD BRAKE SWITCH

PFP:25320

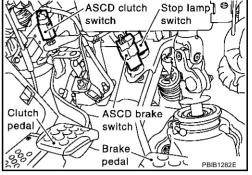
Component Description

ABS008DX

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 this input of two kinds (ON/OFF signal).

Refer to EC-1307 "AUTOMATIC SPEED CONTROL DEVICE

Refer to <u>EC-1307</u>, "<u>AUTOMATIC SPEED CONTROL DEVICE</u> (ASCD)" for the ASCD function.



CONSULT-II Reference Value in Data Monitor Mode

ABS008DY

Specification data are reference values.

MONITOR ITEM	CONE	DITION	SPECIFICATION
DDAKE CWA		Clutch pedal (M/T) and brake pedal: Fully released	ON
BRAKE SW 1 (ASCD brake switch)	Ignition switch: ON	Clutch pedal (M/T) and/or brake pedal: Slightly depressed	OFF
BRAKE SW 2	Ignition switch: ON	Brake pedal fully released	OFF
(stop lamp switch)	• Igrillion switch. ON	Brake pedal depressed	ON

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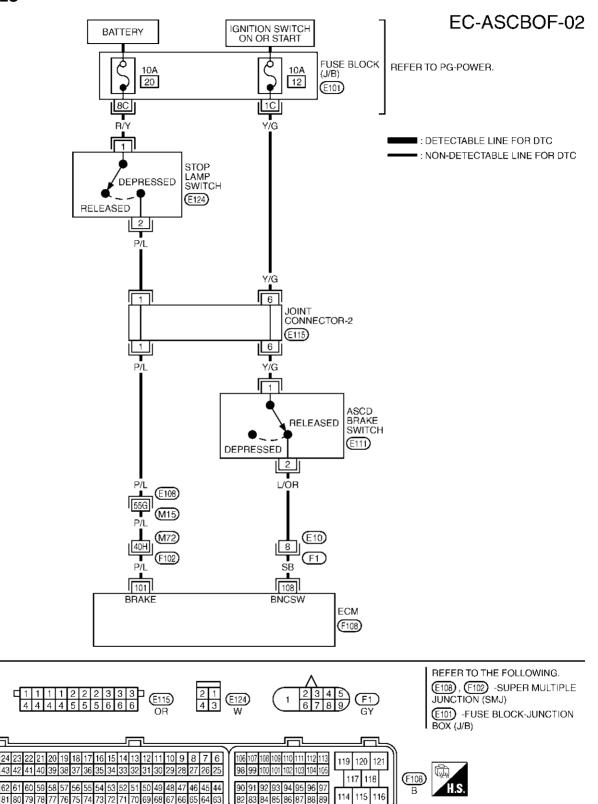
L

Wiring Diagram
A/T MODELS

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ABS0094Y



TBWT0466E

ASCD BRAKE SWITCH

[TYPE 2]

Specification data are reference values and are measured between each terminal and ground.

CAUTION

Do not 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.

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)		
101	P/L	Stop lamp switch	[Ignition switch: ON] ● Brake pedal is fully released	Approximately 0V		
	. , _		[Ignition switch: ON] ● Brake pedal is depressed	BATTERY VOLTAGE (11 - 14V)		
108	SB	ASCD brake switch	[Ignition switch: ON] • Brake pedal is depressed	Approximately 0V		
108	SB ASCD Brake switch	28	ASCE DIAKE SWILLII	ASOD Brake Switch	[Ignition switch: ON] • Brake pedal is fully released	BATTERY VOLTAGE (11 - 14V)

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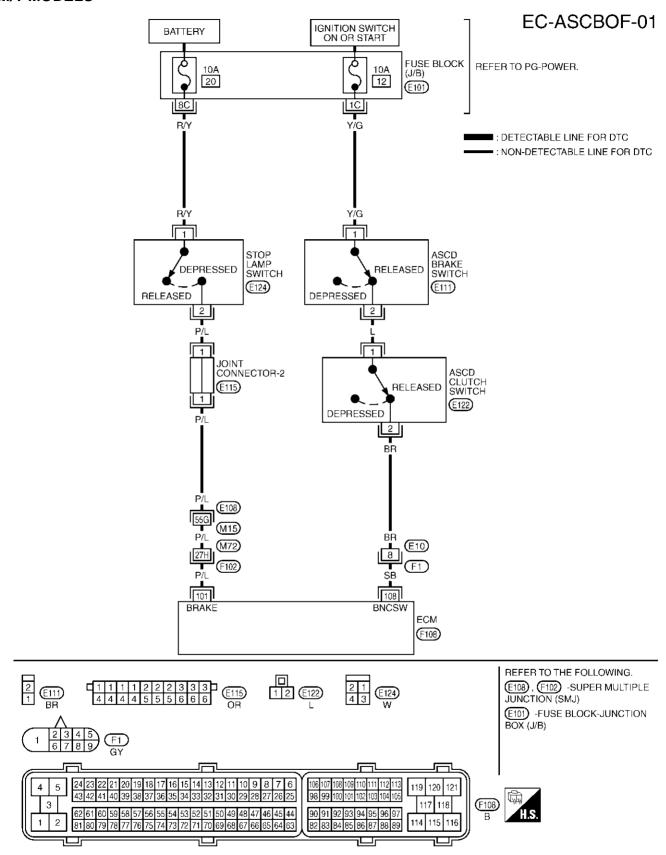
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M/T MODELS



TBWT0465E

ASCD BRAKE SWITCH

[TYPE 2]

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not 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.

			-	
TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
			[Ignition switch: ON] • Brake pedal is fully released	Approximately 0V
101	P/L	Stop lamp switch	[Ignition switch: ON]	BATTERY VOLTAGE
			Brake pedal is depressed Comparison and the comparison of	(11 - 14V)
108	SB	ASCD brake switch	[Ignition switch: ON] Brake pedal and/or clutch pedal are depressed	Approximately 0V
100	SD	ASOD DIAKE SWILCH	[Ignition switch: ON]	BATTERY VOLTAGE
			Brake pedal and clutch pedal are fully released	(11 - 14V)

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Diagnostic Procedure

A/T MODELS

1. CHECK OVERALL FUNCTION-I

(II) With CONSULT-II

- 1. Turn ignition switch ON.
- 2. Select "BRAKE SW1" in "DATA MONITOR" mode with CONSULT-II.
- 3. Check "BRAKE SW1" indication under the following conditions.

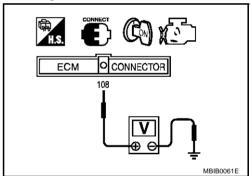
CONDITION	INDICATION
When brake pedal is depressed	OFF
When brake pedal is fully released	ON

DATA MO	NITOR
MONITOR	NO DTC
BRAKE SW1	OFF

(R) Without CONSULT-II

- 1. Turn ignition switch ON.
- 2. Check voltage between ECM terminal 108 and ground under the following conditions.

CONDITION	VOLTAGE
When brake pedal is depressed	Approximately 0V
When brake pedal is fully released	Battery voltage



OK or NG

OK >> GO TO 2. NG >> GO TO 3.

ASCD BRAKE SWITCH

[TYPE 2]

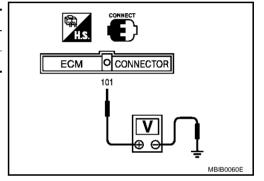
2. CHECK OVERALL FUNCTION-II

With CONSULT-II Check "BRAKE SW2" indication in "DATA MONITOR" mode.

CONDITION	INDICATION
When brake pedal is released	OFF
When brake pedal is depressed	ON

Without CONSULT-II Check voltage between ECM terminal 101 and ground under the following conditions.

CONDITION	VOLTAGE
When brake pedal is released	Approximately 0V
When brake pedal is depressed	Battery voltage



OK or NG

OK >> INSPECTION END

NG >> GO TO 8. EC

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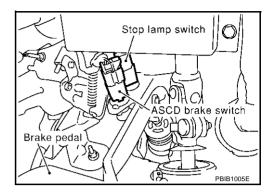
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3. CHECK ASCD BRAKE SWITCH POWER SUPPLY CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect ASCD brake switch harness connector.
- 3. Turn ignition switch ON.

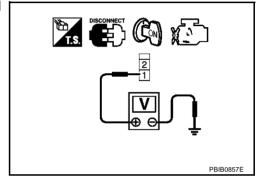


4. Check voltage between ASCD brake switch terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 5. NG >> GO TO 4.



4. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E101
- 10A fuse
- Joint connector-2
- Harness for open or short between ASCD brake switch and fuse
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK ASCD BRAKE SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check harness continuity between ECM terminal 108 and ASCD brake switch terminal 2. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 7. NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E10, F1
- Harness for open or short between ECM and ASCD brake switch
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK ASCD BRAKE SWITCH

Refer to EC-1286, "Component Inspection"

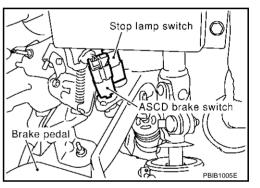
OK or NG

OK >> GO TO 13.

NG >> Replace ASCD brake switch.

8. CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT

- Turn ignition switch OFF.
- Disconnect stop lamp switch harness connector.

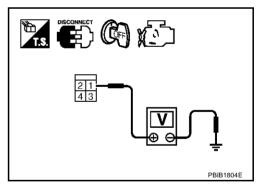


Check voltage between stop lamp switch terminal 1 and ground with CONSULT -II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 10. NG >> GO TO 9.



9. DETECT MALFUNCTIONING PART

Check the following.

Revision; 2004 April

- Fuse block (J/B) connector E101
- 10A fuse
- Harness for open or short between stop lamp switch and fuse
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

EC-1279 2003 G35 Sedan

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10. CHECK STOP LAMP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Disconnect ECM harness connector.
- 2. Check harness continuity between ECM terminal 101 and stop lamp switch terminal 2. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 12. NG >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness connectors M72, F102
- Joint connector-2
- Harness for open or short between ECM and stop lamp switch

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

12. CHECK STOP LAMP SWITCH

Refer to EC-1286, "Component Inspection"

OK or NG

OK >> GO TO 13.

NG >> Replace stop lamp switch.

13. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

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M/T MODELS

1. CHECK OVERALL FUNCTION-I

(II) With CONSULT-II

- 1. Turn ignition switch ON.
- 2. Select "BRAKE SW1" in "DATA MONITOR" mode with CONSULT-II.
- 3. Check "BRAKE SW1" indication under the following conditions.

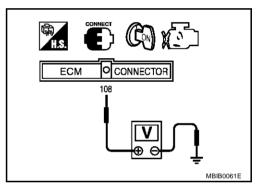
CONDITION	INDICATION
When brake pedal and/or clutch pedal are depressed	OFF
When brake pedal and clutch pedal are fully released	ON

DATA MO	NITOR
MONITOR	NO DTC
BRAKE SW1	OFF

W Without CONSULT-II

- 1. Turn ignition switch ON.
- 2. Check voltage between ECM terminal 108 and ground under the following conditions.

CONDITION	VOLTAGE
When brake pedal and/or clutch pedal are depressed	Approximately 0V
When brake pedal and clutch pedal are fully released	Battery voltage



OK or NG

OK >> GO TO 2.

NG >> GO TO 3.

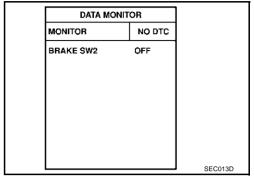
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2. CHECK OVERALL FUNCTION-II

(P) With CONSULT-II

Check "BRAKE SW2" indication in "DATA MONITOR" mode.

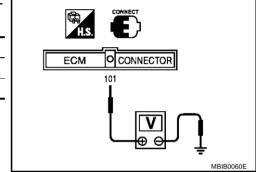
CONDITION	INDICATION
When brake pedal is released	OFF
When brake pedal is depressed	ON



W Without CONSULT-II

Check voltage between ECM terminal 101 and ground under the following conditions.

CONDITION	VOLTAGE
When brake pedal is released	Approximately 0V
When brake pedal is depressed	Battery voltage



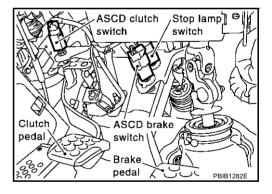
OK or NG

OK >> INSPECTION END

NG >> GO TO 11.

3. CHECK ASCD BRAKE SWITCH CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect ASCD clutch switch harness connector.
- 3. Turn ignition switch ON.

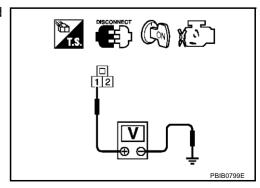


4. Check voltage between ASCD clutch switch terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage

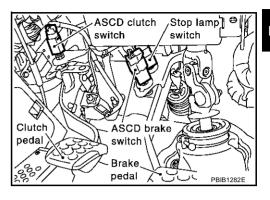
OK or NG

OK >> GO TO 8. NG >> GO TO 4.



4. CHECK ASCD BRAKE SWITCH POWER SUPPLY CIRCUIT

- Turn ignition switch OFF.
- 2. Disconnect ASCD brake switch harness connector.
- Turn ignition switch ON.

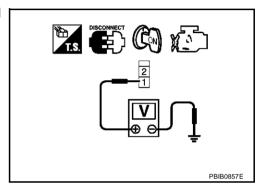


4. Check voltage between ASCD brake switch terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 6. NG >> GO TO 5.



5. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E101
- 10A fuse
- Harness for open or short between ASCD brake switch and fuse
 - >> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK ASCD BRAKE SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF.
- Check harness continuity between ASCD brake switch terminal 2 and ASCD clutch switch terminal 1. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 7.

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

7. CHECK ASCD BRAKE SWITCH

Refer to EC-1286, "Component Inspection"

OK or NG

OK >> GO TO 16.

NG >> Replace ASCD brake switch.

EC-1283 Revision; 2004 April 2003 G35 Sedan

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8. CHECK ASCD CLUTCH SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check harness continuity between ASCD clutch switch terminal 2 and ECM terminal 108. Refer to Wiring Diagram.

Continuity should exist.

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

OK or NG

OK >> GO TO 10. NG >> GO TO 9.

9. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E10, F1
- Harness for open or short between ECM and ASCD clutch switch

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

10. CHECK ASCD CLUTCH SWITCH

Refer to EC-1286, "Component Inspection".

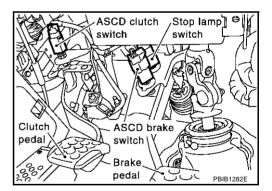
OK or NG

OK >> GO TO 16.

NG >> Replace ASCD clutch switch.

11. CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect stop lamp switch harness connector.

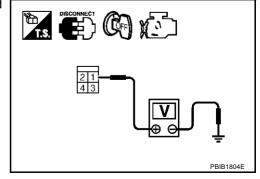


3. Check voltage between stop lamp switch terminal 1 and ground with CONSULT -II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 13. NG >> GO TO 12.



ASCD BRAKE SWITCH

[TYPE 2]

12. DETECT MALFUNCTIONING PART	А
Check the following.	
Fuse block (J/B) connector E101	EC
 10A fuse Harness for open or short between stop lamp switch and fuse 	
Trainess for open or short between stop lamp switch and lase	
>> Repair open circuit or short to ground or short to power in harness or connectors.	С
13. CHECK STOP LAMP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT	_ D
Disconnect ECM harness connector.	– D
Check harness continuity between ECM terminal 101 and stop lamp switch terminal 2. Refer to Wiring Diagram.	Е
Continuity should exist.	
 Also check harness for short to ground and short to power. OK or NG 	F
OK >> GO TO 15. NG >> GO TO 14.	G
14. DETECT MALFUNCTIONING PART	
Check the following.	Н
Harness connectors E108, M15	
Harness connectors M72, F102	ı
 Joint connector-2 Harness for open or short between ECM and stop lamp switch 	
Trainess for open or short between Low and stop famp switch	
>> Repair open circuit or short to ground or short to power in harness or connectors.	J
15. CHECK STOP LAMP SWITCH	K
Refer to EC-1286, "Component Inspection"	_
OK or NG	
OK >> GO TO 16. NG >> Replace stop lamp switch.	L
16. CHECK INTERMITTENT INCIDENT	M

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> INSPECTION END

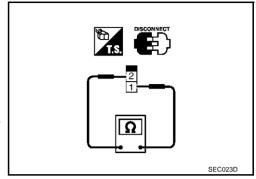
Component Inspection ASCD BRAKE SWITCH

ABS008E1

- 1. Turn ignition switch OFF.
- 2. Disconnect ASCD brake switch harness connector.
- 3. Check harness continuity between ASCD brake switch terminals 1 and 2 under the following conditions.

Condition	Continuity
When brake pedal is fully released.	Should exist.
When brake pedal is depressed.	Should not exist.

If NG, adjust ASCD brake switch installation, refer to <u>BR-6</u>, <u>"BRAKE PEDAL"</u>, and perform step 3 again.

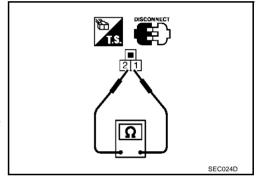


ASCD CLUTCH SWITCH

- 1. Turn ignition switch OFF.
- 2. Disconnect ASCD clutch switch harness connector.
- 3. Check harness continuity between ASCD clutch switch terminals 1 and 2 under the following conditions.

Condition	Continuity
When clutch pedal is fully released.	Should exist.
When clutch pedal is depressed.	Should not exist.

If NG, adjust ASCD clutch switch installation, refer to <u>CL-5</u>, <u>"CLUTCH PEDAL"</u>, and perform step 3 again.

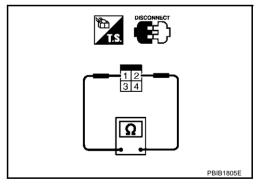


STOP LAMP SWITCH

- 1. Turn ignition switch OFF.
- 2. Disconnect stop lamp switch harness connector.
- 3. Check harness continuity between stop lamp switch terminals 1 and 2 under the following conditions.

Condition	Continuity
When brake pedal is fully released.	Should not exist.
When brake pedal is depressed.	Should exist.

If NG, adjust stop lamp switch installation, refer to <u>BR-6</u>, <u>"BRAKE PEDAL"</u>, and perform step 3 again.



ASCD INDICATOR

[TYPE 2]

ASCD INDICATOR PFP:24814

Component Description

ABS008F2

ASCD indicator lamp illuminates to indicate ASCD operation status. Lamp has two indicators, CRUISE and SET, and is integrated in combination meter.

CRUISE indicator illuminates when CRUISE switch on ASCD steering switch is turned ON to indicated that ASCD system is ready for operation.

SET indicator illuminates when following conditions are met.

- CRUISE indicator is illuminated.
- SET switch on ASCD steering switch is turned ON while vehicle speed is within the range of ASCD setting.

SET indicator remains lit during ASCD control.

Refer to EC-1307, "AUTOMATIC SPEED CONTROL DEVICE (ASCD)" for the ASCD function.

CONSULT-II Reference Value in Data Monitor Mode

ABS008E3

Specification data are reference value.

MONITOR ITEM	CONDITION		SPECIFICATION
CRUISE LAMP	Ignition switch: ON	CRUISE switch pressed	ON
		CRUISE switch released	OFF
SET LAMP	CRUISE switch: ON	COAST/SET switch pressed	ON
	When vehicle speed is between 40 km/h (25 MPH) and 144 km/h (89 MPH)	COAST/SET switch released	OFF

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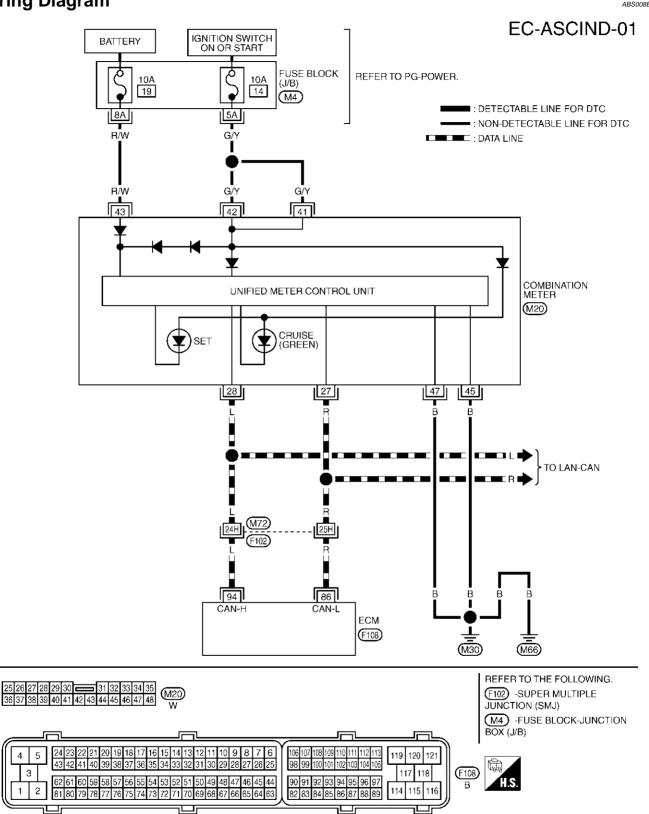
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Wiring Diagram



TBWT0305E

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ASCD INDICATOR

[TYPE 2]

Diagnostic Procedure

1. CHECK OVERALL FUNCTION

Check ASCD indicator under the following conditions.

ASCD INDICATOR	CONDITION		SPECIFICATION
CRUISE LAMP	Ignition switch: ON	CRUISE switch pressed	ON
		CRUISE switch released	OFF
	CRUISE switch: ON	COAST/SET switch pressed	ON
	 When vehicle speed is between 40 km/h (25 MPH) and 144 km/h (89 MPH) 	COAST/SET switch released	OFF

OK or NG

OK >> INSPECTION END

NG >> GO TO 2.

2. CHECK DTC

Check that DTC U1000 or U1001 is not displayed.

OK or NG

OK >> GO TO 3.

NG >> Perform trouble diagnoses for DTC U1000, U1001. Refer to <u>EC-788, "DTC U1000, U1001 CAN COMMUNICATION LINE"</u>.

3. CHECK COMBINATION METER OPERATION

Does combination meter operate normally?

Yes or No

Yes >> GO TO 4.

No >> Check combination meter circuit. Refer to <u>DI-4, "COMBINATION METERS"</u>.

4. CHECK INTERMITTENT INCIDENT

Refer to EC-780, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT".

>> INSPECTION END

EC

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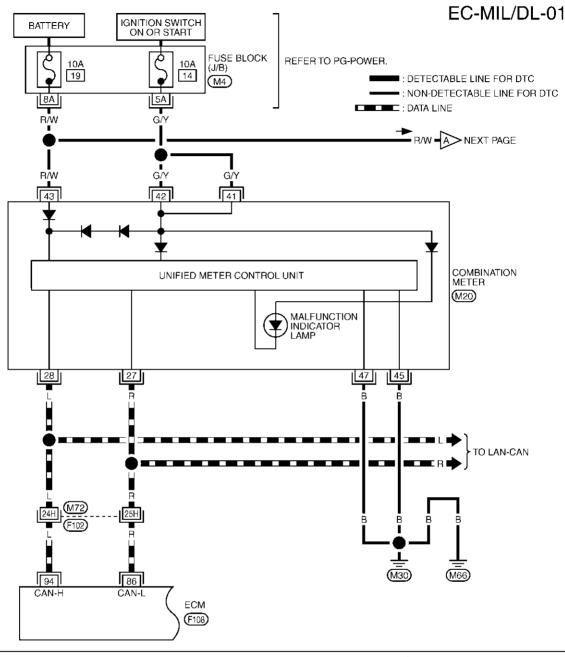
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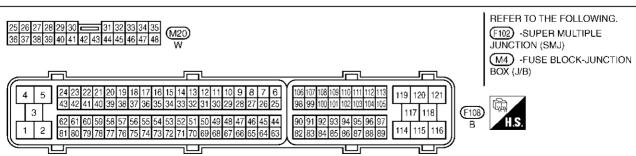
MIL AND DATA LINK CONNECTOR

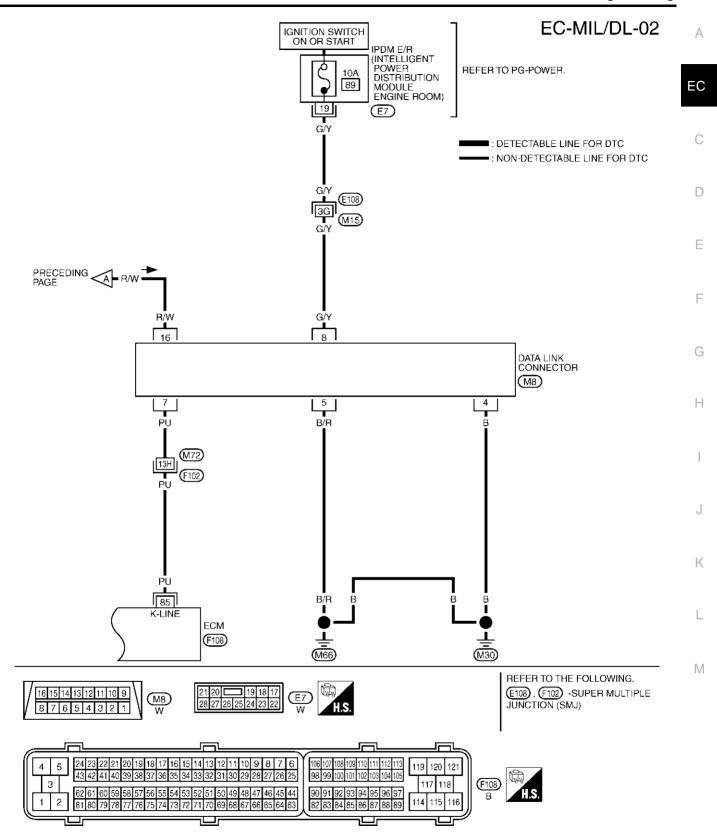
PFP:24814

Wiring Diagram

ABS008E6







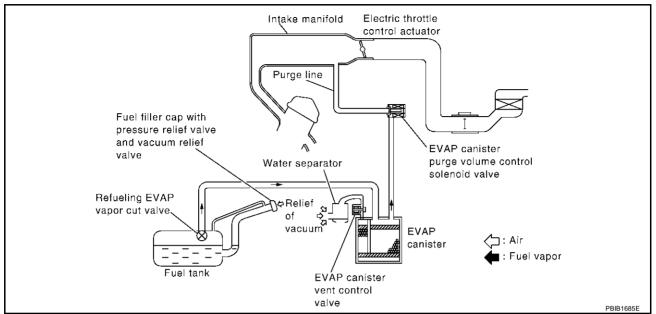
TBWT0440E

EVAPORATIVE EMISSION SYSTEM

PFP:14950

Description SYSTEM DESCRIPTION

ABS008E7



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.

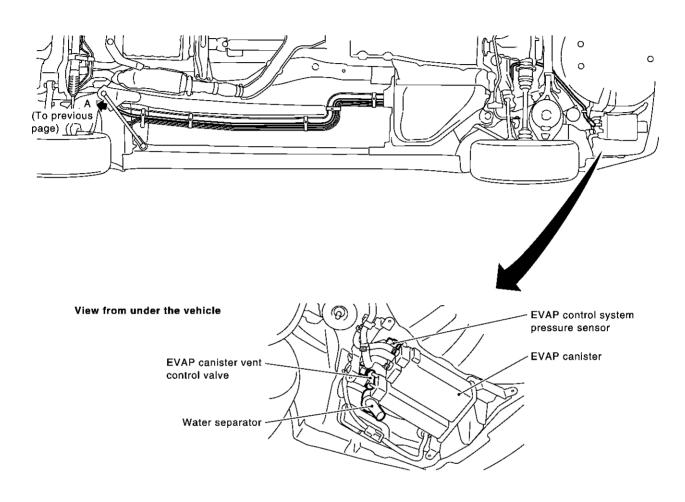
EVAP canister purge volume control solenoid valve also shuts off the vapor purge line during decelerating and idling.

[TYPE 2] **EVAPORATIVE EMISSION LINE DRAWING** Α EC Intake manifold collector С D Е F **EVAP** service port G Н EVAP canister purge volume control solenoid valve

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

A (From next page) PBIB1022E

EC-1293 2003 G35 Sedan Revision; 2004 April



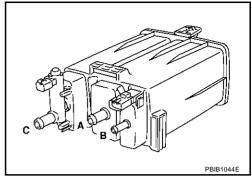
[TYPE 2]

ABS008E8

Component Inspection EVAP CANISTER

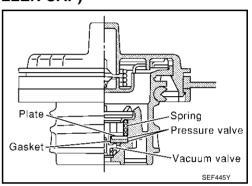
Check EVAP canister as follows:

- 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 ${\bf B}$ and check that vacuum pressure exists at the ports ${\bf A}$ and ${\bf C}$.
- 5. Block port A and B.
- 6. Apply pressure to port **C** and check that there is no leakage.



FUEL TANK VACUUM RELIEF VALVE (BUILT INTO FUEL FULLER CAP)

1. Wipe clean valve housing.



2. Check valve opening pressure and vacuum.

Pressure: 15.3 - 20.0 kPa (0.156 - 0.204 kg/cm², 2.22

- 2.90 psi)

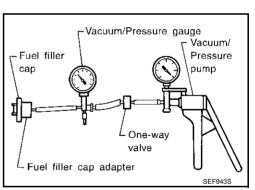
Vacuum: $-6.0 \text{ to } -3.3 \text{ kPa} (-0.061 \text{ to } -0.034 \text{ kg/cm}^2$,

-0.87 to -0.48 psi)

3. If out of specification, replace fuel filler cap as an assembly.

CAUTION:

Use only a genuine fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the MIL may come on.



EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-989.

FUEL TANK TEMPERATURE SENSOR

Refer to EC-930.

EVAP CANISTER VENT CONTROL VALVE

Refer to EC-996.

EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-1006.

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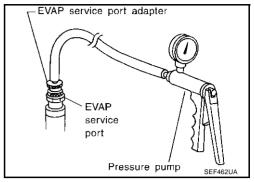
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EVAP SERVICE PORT

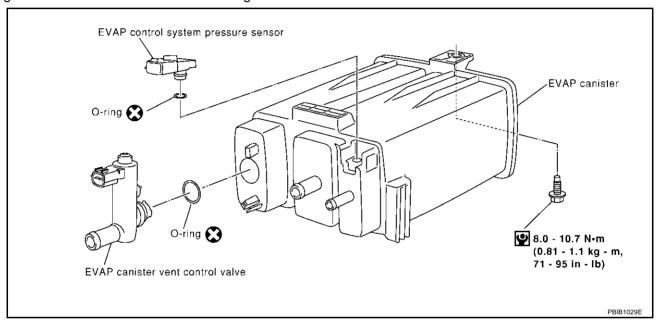
Positive pressure is delivered to the EVAP system through the EVAP service port. If fuel vapor leakage in the EVAP system occurs, use a leak detector to locate the leak.



ABS008E9

Removal and Installation EVAP CANISTER

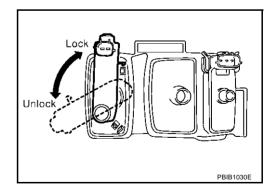
Tighten EVAP canister as shown in the figure.



EVAP CANISTER VENT CONTROL VALVE

- 1. Turn EVAP canister vent control valve counterclockwise.
- 2. Remove the EVAP canister vent control valve.

Do not reuse the O-ring, replace it with a new one.



How to Detect Fuel Vapor Leakage

ABS008EA

CAUTION:

- Never 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.

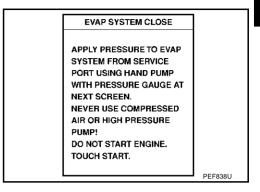
NOTE:

- Do not start engine.
- Improper installation of EVAP service port adapter to the EVAP service port may cause a leak.

[TYPE 2]

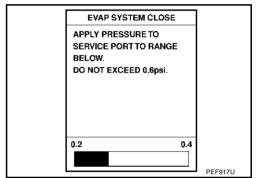
(A) WITH CONSULT-II

- 1. Attach the EVAP service port adapter securely to the EVAP service port.
- 2. Also attach the pressure pump and hose to the EVAP service port adapter.
- 3. Turn ignition switch ON.
- 4. Select the "EVAP SYSTEM CLOSE" of "WORK SUPPORT MODE" with CONSULT-II.
- 5. Touch "START". A bar graph (Pressure indicating display) will appear on the screen.

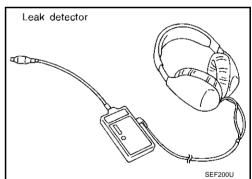


6. Apply positive pressure to the EVAP system until the pressure indicator reaches the middle of the bar graph.

7. Remove EVAP service port adapter and hose with pressure pump.

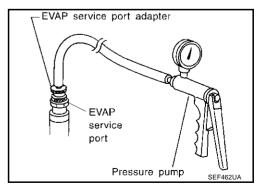


8. Locate the leak using a leak detector. Refer to EC-1293, "EVAP-ORATIVE EMISSION LINE DRAWING".



® WITHOUT CONSULT-II

- Attach the EVAP service port adapter securely to the EVAP service port.
- 2. Also attach the pressure pump with pressure gauge to the EVAP service port adapter.



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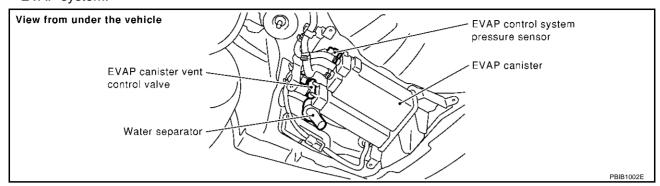
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EVAPORATIVE EMISSION SYSTEM

[TYPE 2]

3. Apply battery voltage to between the terminals of EVAP canister vent control valve to make a closed EVAP system.



- 4. 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).
- 5. Remove EVAP service port adapter and hose with pressure pump.
- 6. Locate the leak using a leak detector. Refer to EC-1293, "EVAPORATIVE EMISSION LINE DRAWING" .

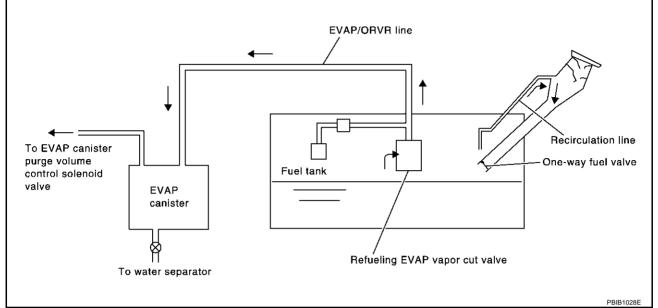
[TYPE 2]

ON BOARD REFUELING VAPOR RECOVERY (ORVR)

PFP:00032

System Description

ABSOORER



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: INFLAMMABLE" sign in workshop.
- Do not smoke while servicing fuel system. Keep open flames and sparks away from work area.
- Be sure to 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-694, "FUEL PRESSURE RELEASE"</u>.
- Disconnect battery ground cable.
- Always replace O-ring when the fuel gauge retainer is removed.
- Do not kink or twist hose and tube when they are installed.
- Do not tighten hose and clamps excessively to avoid damaging hoses.
- After installation, run engine and check for fuel leaks at connection.
- Do not 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.

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[TYPE 2]

Diagnostic Procedure SYMPTOM: FUEL ODOR FROM EVAP CANISTER IS STRONG.

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1. 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).

OK or NG

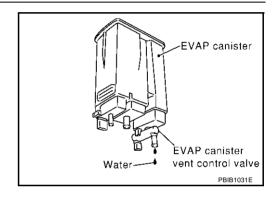
OK >> GO TO 2. NG >> GO TO 3.

2. CHECK IF EVAP CANISTER SATURATED WITH WATER

Does water drain from the EVAP canister?

Yes or No

Yes >> GO TO 3. No >> GO TO 6.



3. REPLACE EVAP CANISTER

Replace EVAP canister with a new one.

>> GO TO 4.

4. CHECK WATER SEPARATOR

Refer to EC-1302, "Component Inspection".

OK or NG

OK >> GO TO 5.

NG >> Replace water separator.

5. DETECT MALFUNCTIONING PART

Check the EVAP hose between EVAP canister and water separator for clogging or poor connection.

>> Repair or replace EVAP hose.

6. CHECK REFUELING EVAP VAPOR CUT VALVE

Refer to EC-1302, "Component Inspection".

OK or NG

OK >> INSPECTION END

NG >> Replace refueling EVAP vapor cut valve with fuel tank.

[TYPE 2]

SYMPTOM: CANNOT REFUEL/FUEL ODOR FROM THE FUEL FILLER OPENING IS STRONG WHILE REFUELING.

1. CHECK EVAP CANISTER

- 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).

OK or NG

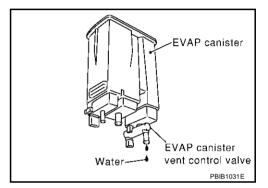
OK >> GO TO 2. NG >> GO TO 3.

$2.\,$ check if evap canister saturated with water

Does water drain from the EVAP canister?

Yes or No

Yes >> GO TO 3. No >> GO TO 6.



3. REPLACE EVAP CANISTER

Replace EVAP canister with a new one.

>> GO TO 4.

4. CHECK WATER SEPARATOR

Refer to EC-1302, "Component Inspection".

OK or NG

OK >> GO TO 5.

NG >> Replace water separator.

5. DETECT MALFUNCTIONING PART

Check the EVAP hose between EVAP canister and water separator for clogging or poor connection.

>> Repair or replace EVAP hose.

6. CHECK VENT HOSES AND VENT TUBES

Check hoses and tubes between EVAP canister and refueling EVAP vapor cut valve for clogging, kink, looseness and improper connection.

EC-1301

OK or NG

OK >> GO TO 7.

NG >> Repair or replace hoses and tubes.

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7. CHECK FILLER NECK TUBE

Check recirculation line for clogging, dents and cracks.

OK or NG

OK >> GO TO 8.

NG >> Replace filler neck tube.

8. CHECK REFUELING EVAP VAPOR CUT VALVE

Refer to EC-1302, "Component Inspection".

OK or NG

OK >> GO TO 9.

NG >> Replace refueling EVAP vapor cut valve with fuel tank.

9. CHECK FUEL FILLER TUBE

Check filler neck tube and hose connected to the fuel tank for clogging, dents and cracks.

OK or NG

OK >> GO TO 10.

NG >> Replace fuel filler tube.

10. CHECK ONE-WAY FUEL VALVE-I

Check one-way valve for clogging.

OK or NG

OK >> GO TO 11.

NG >> Repair or replace one-way fuel valve with fuel tank.

11. CHECK ONE-WAY FUEL VALVE-II

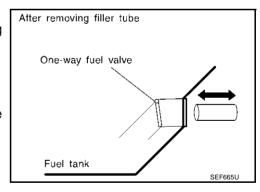
- 1. Make sure that fuel is drained from the tank.
- 2. Remove fuel filler tube and hose.
- Check one-way fuel valve for operation as follows. When a stick is inserted, the valve should open, when removing stick it should close.

Do not drop any material into the tank.

OK or NG

OK >> INSPECTION END

NG >> Replace fuel filler tube or replace one-way fuel valve with fuel tank.



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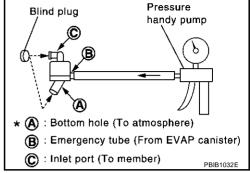
Component Inspection WATER SEPARATOR

- 1. Check visually for insect nests in the water separator air inlet.
- Check visually for cracks or flaws in the appearance.
- Check visually for cracks or flaws in the hose.

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- Check that A and C are not clogged by blowing air into B with A, and then C plugged.
- In case of NG in items 2 4, replace the parts.

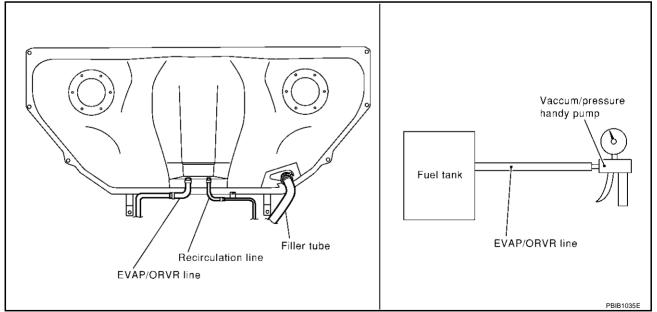
Do not disassemble water separator.



REFUELING EVAP VAPOR CUT VALVE

(With CONSULT-II

- Remove fuel tank. Refer to FL-12, "FUEL TANK".
- 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-II.
- 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.
- Check refueling EVAP vapor cut valve for being stuck to open as follows.
- а Connect vacuum pump to hose end.
- Remove fuel gauge retainer with fuel gauge unit.
 - Always replace O-ring with new one.
- Put fuel tank upside down. C.
- Apply vacuum pressure to hose end [-13.3 kPa (-100 mmHg, -3.94 inHg)] with fuel gauge retainer remaining open and check that the pressure is applicable.



(R) Without CONSULT-II

- Remove fuel tank. Refer to FL-12, "FUEL TANK".
- 2. Drain fuel from the tank as follows:
- Remove fuel gauge retainer.
- Drain fuel from the tank using a handy pump into a fuel container. b.
- Check refueling EVAP vapor cut valve for being stuck to close as follows.

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Revision; 2004 April

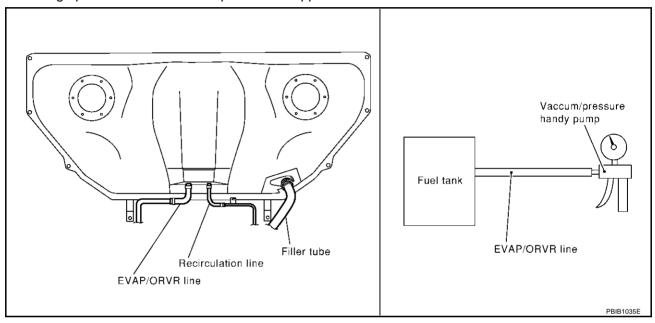
[TYPE 2]

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.

- 4. Check refueling EVAP vapor cut valve for being stuck to open as follows.
- a. Connect vacuum pump to hose end.
- b. Remove fuel gauge retainer with fuel gauge unit.

Always replace O-ring with new one.

- c. Put fuel tank upside down.
- d. Apply vacuum pressure to hose end [-13.3 kPa (-100 mmHg, -3.94 inHg)] with fuel gauge retainer remaining open and check that the pressure is applicable.



[TYPE 2]

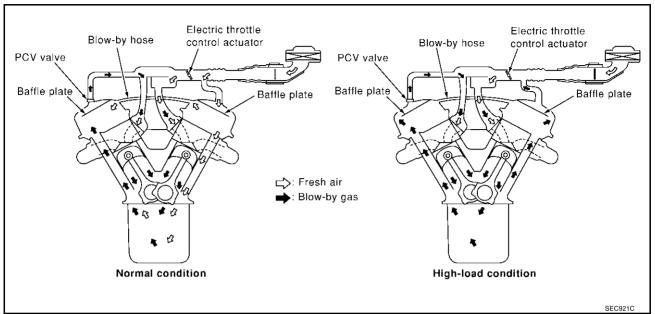
POSITIVE CRANKCASE VENTILATION

PFP:11810

Description SYSTEM DESCRIPTION

ABS008EE

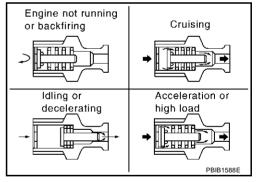
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This system returns blow-by gas to the intake manifold.

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 then 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.

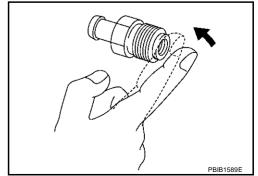
On vehicles with an excessively high blow-by, the valve does not meet the requirement. This is because some of the flow will go through the hose connection to the air inlet tubes under all conditions.



ABS008EF

Component Inspection PCV (POSITIVE CRANKCASE VENTILATION) VALVE

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.

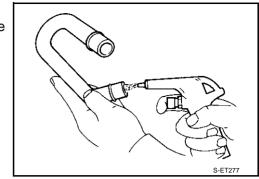


POSITIVE CRANKCASE VENTILATION

[TYPE 2]

PCV VALVE VENTILATION HOSE

- 1. Check hoses and hose connections for leaks.
- 2. Disconnect all hoses and clean with compressed air. If any hose cannot be freed of obstructions, replace.



AUTOMATIC SPEED CONTROL DEVICE (ASCD)

[TYPE 2]

AUTOMATIC SPEED CONTROL DEVICE (ASCD)

PFP:18930

System Description INPUT/OUTPUT SIGNAL CHART

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Input signal to ECM	ECM function	Actuator	E
Brake pedal operation			
Brake pedal operation			
Clutch pedal operation			
Brake pedal operation Brake pedal operation Clutch pedal operation ASCD steering switch operation	ASCD vehicle speed control	Electric throttle control	
	ACCE veriloic speed control	actuator	
Vehicle speed			
Powertrain revolution			
	Brake pedal operation Brake pedal operation Clutch pedal operation ASCD steering switch operation Gear position Vehicle speed	Brake pedal operation Brake pedal operation Clutch pedal operation ASCD steering switch operation Gear position Vehicle speed	Brake pedal operation Brake pedal operation Clutch pedal operation ASCD steering switch operation Gear position Vehicle speed Electric throttle control actuator

^{*:} This signal is sent to the ECM through 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 ASCD system, it automatically deactivates control.

NOTE:

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

SET OPERATION

Press ASCD CRUISE switch (Main switch). (The CRUISE indicator in combination meter illuminates.) When vehicle speed reaches a desired speed between approximately 40 km/h (25 MPH) and 144 km/h (89 MPH), press SET switch. (Then SET indicator in combination meter illuminates.)

ACCEL OPERATION

If the RESUME/ACCEL 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 keep the new set speed.

CANCEL OPERATION

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

- CANCEL switch is depressed
- More than 2 switches at ASCD steering switch are pressed at the same time (Set speed will be cleared)
- Brake pedal is depressed
- Clutch pedal is depressed or gear position is changed to the neutral position (M/T models)
- Selector lever is changed to N, R, P position (A/T models)
- Vehicle speed decreased to 13 km/h (8 MPH) lower than the set speed
- VDC/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 indicator 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 switch or RESUME switch.
- Malfunction for some self-diagnoses regarding ASCD control: SET lamp will blink quickly.

If MAIN switch is turned to OFF during ASCD is activated, all of ASCD operations will be canceled and vehicle speed memory will be erased.

AUTOMATIC SPEED CONTROL DEVICE (ASCD)

[TYPE 2]

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 keep the new set speed.

RESUME OPERATION

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

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

AUTOMATIC SPEED CONTROL DEVICE (ASCD)

[TYPE 2]

Component Description ASCD STEERING SWITCH

ABS008EH

Refer to EC-1171.

ASCD BRAKE SWITCH

Refer to <u>EC-1178</u>, and <u>EC-1271</u>.

ASCD CLUTCH SWITCH

Refer to EC-1178.

STOP LAMP SWITCH

Refer to EC-1178, EC-1206 and EC-1271.

ELECTRIC THROTTLE CONTROL ACTUATOR

Refer to $\underline{\text{EC-}1064}$, $\underline{\text{EC-}1066}$, $\underline{\text{EC-}1072}$ and $\underline{\text{EC-}1077}$.

ASCD INDICATOR

Refer to EC-1287.

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SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Fuel Pressure

Fuel pressure at idling kPa (kg/cm², psi)

Approximately 350 (3.57, 51)

Idle Speed and Ignition Timing

ABS0094Z

ABS008EI

Target idle speed	A/T	No-load* (in P or N position)	650±50 rpm
	M/T	No-load* (in Neutral position)	650±50 rpm
Air conditioner: ON	A/T	In P or N position	775 rpm or more
	M/T	In Neutral position	
Ignition timing	A/T	In P or N position	15° ± 5° BTDC
	M/T	In Neutral position	

^{*:} Under the following conditions:

- Air conditioner switch: OFF
- Electric load: OFF (Lights, heater fan & rear window defogger)
- Steering wheel: Kept in straight-ahead position

Calculated Load Value

ABS008EK

Conditions Calculated load value % (Using CONSULT-II or	
At idle	5 - 35
At 2,500 rpm	5 - 35

Mass Air Flow Sensor

ABS008EL

Supply voltage	Battery voltage (11 - 14V)	
Output voltage at idle	1.1 - 1.5*V	
Mass air flow (Using CONSULT-II 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.

Intake Air Temperature Sensor

ABS008EM

Temperature °C (°F)	Resistance kΩ	
25 (77)	1.94 - 2.06	
80 (176)	0.295 - 0.349	

Engine Coolant Temperature Sensor

ABS008EN

Temperature °C (°F)	Resistance k Ω	
20 (68)	2.1 - 2.9	
50 (122)	0.68 - 1.00	
90 (194)	0.236 - 0.260	

Heated Oxygen Sensor 1 Heater

ABS008EO

Resistance [at 25°C (77°F)]	$3.3 - 4.0\Omega$

Heated Oxygen sensor 2 Heater

ABS008EP

Resistance [at 25°C (77°F)] Crankshaft Position Sensor (POS)

ABS008EQ

 $5.0 - 7.0\Omega$

Refer to EC-954, "Component Inspection".

Camshaft Position Sensor (PHASE)

ABS008ER

Refer to EC-963, "Component Inspection".

SERVICE DATA AND SPECIFICATIONS (SDS)

[TYPE 2]

Throttle Control Motor		ABS008ES	۸
Resistance [at 25°C (77°F)]	Approximately 1 - 15Ω		A
Injector		ABS008ET	
Resistance [at 10 – 60°C (50 – 140°F)]	13.5 - 17.5Ω		EC
Fuel Pump		ABS008EU	0
Resistance [at 25°C (77°F)]	Approximately 1.0Ω		C

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