SECTION ECEC ENGINE CONTROL SYSTEM o

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PRECAUTION PRECAUTIONS

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT **PRF-TENSIONER**" INFOID:000000012406239

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the "SRS AIR BAG" and "SEAT BELT" of this Service Manual.

WARNING:

Always observe the following items for preventing accidental activation.

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that 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 "SRS AIR BAG".
- Never use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

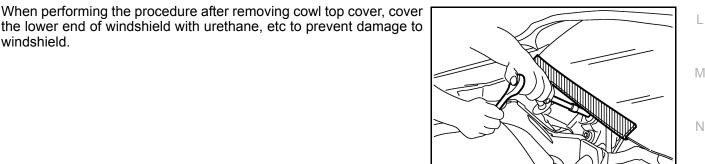
WARNING:

windshield.

Always observe the following items for preventing accidental activation.

- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, never use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.

Precaution for Procedure without Cowl Top Cover



(2)

Precautions For Xenon Headlamp Service

PIIB3706J INFOID:000000012406240

INFOID:000000012406241

WARNING:

Comply with the following warnings to prevent any serious accident.

- Disconnect the battery cable (negative terminal) or the power supply fuse before installing, removing, or touching the xenon headlamp (bulb included). The xenon headlamp contains high-voltage generated parts.
- · Never work with wet hands.
- Check the xenon headlamp ON-OFF status after assembling it to the vehicle. Never turn the xenon headlamp ON in other conditions. Connect the power supply to the vehicle-side connector.

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< PRECAUTION >

- (Turning it ON outside the lamp case may cause fire or visual impairments.)
- Never touch the bulb glass immediately after turning it OFF. It is extremely hot.

CAUTION:

- Comply with the following cautions to prevent any error and malfunction.
- Install the xenon bulb securely. (Insufficient bulb socket installation may melt the bulb, the connector, the housing, etc. by high-voltage leakage or corona discharge.)
- Never perform HID circuit inspection with a tester.
- Never touch the xenon bulb glass with hands. Never put oil and grease on it.
- Dispose of the used xenon bulb after packing it in thick vinyl without breaking it.
- Never wipe out dirt and contamination with organic solvent (thinner, gasoline, etc.).

Precautions for Removing Battery Terminal

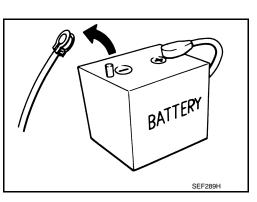
When disconnecting the battery terminal, pay attention to the following.

• Always use a 12V battery as power source.

: 2 minutes

- Never disconnect battery terminal while engine is running.
- When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.
- For vehicles with the engine listed below, remove the battery terminal after a lapse of the specified time:

D4D engine	: 20 minutes	YS23DDT	: 4 minutes
HRA2DDT	: 12 minutes	YS23DDTT	: 4 minutes
K9K engine	: 4 minutes	ZD30DDTi	: 60 seconds
M9R engine	: 4 minutes	ZD30DDTT	: 60 seconds
R9M engine	: 4 minutes		
V9X engine	: 4 minutes		



NOTE:

YD25DDTi

ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.

 After high-load driving, if the vehicle is equipped with the V9X engine, turn the ignition switch OFF and wait for at least 15 minutes to remove the battery terminal.

NOTE:

- Turbocharger cooling pump may operate in a few minutes after the ignition switch is turned OFF.
- Example of high-load driving
- Driving for 30 minutes or more at 140 km/h (86 MPH) or more.
- Driving for 30 minutes or more on a steep slope.
- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.

NOTE:

If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.

• After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC. **NOTE:**

The removal of 12V battery may cause a DTC detection error.

On Board Diagnostic (OBD) System of Engine and CVT

INFOID:000000012406243

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

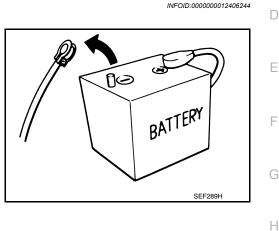
- Always to turn the ignition switch OFF and disconnect the negative battery cable before any repair or inspection work. The open/short circuit of related switches, sensors, solenoid valves, etc. will cause the MIL to illuminate.
- Always to connect and lock the connectors securely after work. A loose (unlocked) connector will cause the MIL to illuminate due to the open circuit. (Be sure the connector is free from water, grease, dirt, bent terminals, etc.)

< PRECAUTION >

- Certain systems and components, especially those related to OBD, may use a new style slide-locking type harness connector. For description and how to disconnect, refer to <u>PG-6</u>, "<u>Harness Connec-</u> <u>tor</u>".
- Always route and secure the harnesses properly after work. The interference of the harness with a bracket, etc. may cause the MIL to illuminate due to the short circuit.
- Always to connect rubber tubes properly after work. A misconnected or disconnected rubber tube may cause the MIL to illuminate due to the malfunction of the EVAP system or fuel injection system, etc.
- Always to erase the unnecessary malfunction information (repairs completed) from the ECM and TCM (Transmission control module) before returning the vehicle to the customer.

General Precautions

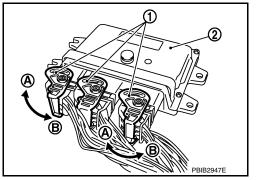
- Always use a 12 volt battery as power source.
- Never attempt to disconnect battery cables while engine is running.
- Before connecting or disconnecting the ECM harness connector, turn ignition switch OFF and disconnect negative battery cable. Failure to do so may damage the ECM because battery voltage is applied to ECM even if ignition switch is turned OFF.
- Before removing parts, turn ignition switch OFF and then disconnect battery ground cable.



• Never disassemble ECM.

 If a battery cable is disconnected, the memory will return to the ECM value. The ECM will now start to self-control at its initial value. Thus, engine operation can vary slightly in this case. However, this is not an indication of a malfunction. Never replace parts because of a slight variation.

- If the battery is disconnected, the following emission-related diagnostic information will be lost within 24 hours.
- Diagnostic trouble codes
- 1st trip diagnostic trouble codes
- Freeze frame data
- 1st trip freeze frame data
- System readiness test (SRT) codes
- Test values
- When connecting ECM harness connector, fasten (B) it securely with a lever (1) as far as it will go as shown in the figure.
- ECM (2)
- Loosen (A)



2016 Quest

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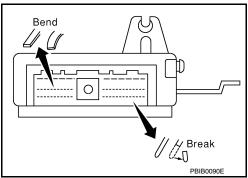
[VQ35DE]

EC

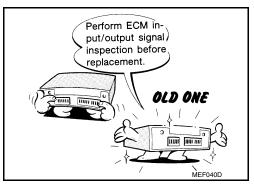
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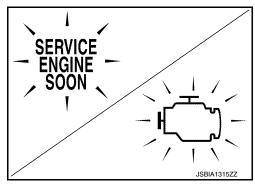
< PRECAUTION >

- When connecting or disconnecting pin connectors into or from ECM, never damage pin terminals (bends or break). Check that there are not any bends or breaks on ECM pin terminal, when connecting pin connectors.
- Securely connect ECM harness connectors.
 A poor connection can cause an extremely high (surge) voltage to develop in coil and condenser, thus resulting in damage to ICs.
- Keep engine control system harness at least 10 cm (4 in) away from adjacent harness, to prevent engine control system malfunctions due to receiving external noise, degraded operation of ICs, etc.
- Keep engine control system parts and harness dry.
- Before replacing ECM, perform ECM Terminals and Reference Value inspection and check ECM functions properly. Refer to <u>EC-83, "Reference Value"</u>.
- Handle mass air flow sensor carefully to avoid damage.
- Never clean mass air flow sensor with any type of detergent.
- Never disassemble electric throttle control actuator.
- Even a slight leakage in the air intake system can cause serious incidents.
- Never shock or jar the camshaft position sensor (PHASE), crankshaft position sensor (POS).
- After performing each TROUBLE DIAGNOSIS, perform DTC Confirmation Procedure or Component Function Check. The DTC should not be displayed in the DTC Confirmation Procedure if the repair is completed. The Component Function Check should be a good result if the repair is completed.



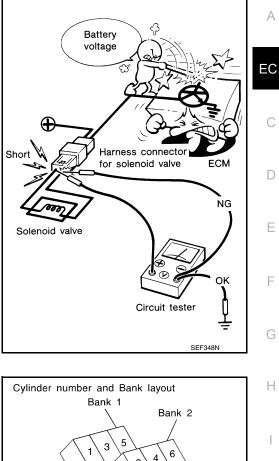
[VQ35DE]





< PRECAUTION >

 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.

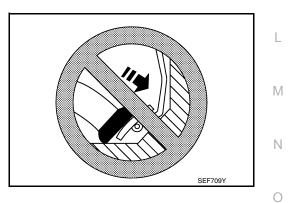


[VQ35DE]

- B1 indicates bank 1, B2 indicates bank 2 as shown in the figure.
- Never operate fuel pump when there is no fuel in lines.
- Tighten fuel hose clamps to the specified torque.



- · Immediately after starting, never rev up engine unnecessarily.
- Never rev up engine just prior to shutdown.



Crankshaft pulley

SEC893C

Front

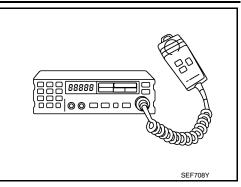
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< PRECAUTION >

When installing C.B. ham radio or a mobile phone, be sure to observe the following as it may adversely affect electronic control systems depending on installation location.

- Keep the antenna as far as possible from the electronic control units.
- Keep the antenna feeder line more than 20 cm (8 in) away from the harness of electronic controls.
- Never let them run parallel for a long distance.
- Adjust the antenna and feeder line so that the standing-wave ratio can be kept smaller.
- Be sure to ground the radio to vehicle body.



PREPARATION

LEC642

LBIA0376E

Description

type fuel lines

Checks fuel pressure

< PREPARATION >		
PREPARATI	ION	
PREPARATION	l	
Special Service To	ools	
The actual shapes of TechMa	ate tools may differ from those of special service tools illus	strated
Tool number (TechMate No.) Tool name		
(TechMate No.)		Des Che

(J-44321-6)

Fuel pressure adapter

Commercial Service Tools INFOID:000000012406246 Tool name Description (TechMate No.) (J-45488) Removes fuel tube quick connectors in engine Quick connector reroom lease PBIC0198E Leak detector Locates the EVAP leakage i.e.: (J-41416) S-NT703 EVAP service port Applys positive pressure through EVAP service adapter port i.e.: (J-41413-OBD) S-NT704

EC-15

[VQ35DE]

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2016 Quest

Connects fuel pressure gauge to quick connector

PREPARATION

< PREPARATION >

Tool name (TechMate No.)		Description
Fuel filler cap adapter i.e.: (J-42909)		Checks fuel tank vacuum relief valve opening pressure
	ALEIA1353ZZ	
Socket wrench	19 mm (0.75 in) 19 mm (0.75 in) 19 mm Nore than 19 mm (1.26 in) 19 mm 19 mm 10	Removes and installs engine coolant temperature sensor. Refer to <u>CO-27, "Exploded View"</u> .
Oxygen sensor thread cleaner i.e.: (J-43897-18) (J-43897-12)	Mating surface shave cylinder	Reconditions 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 Zirco- nia Oxygen Sensor b: 12 mm diameter with pitch 1.25 mm for Tita- nia Oxygen Sensor
Anti-seize lubricant i.e.: (Permatex TM 133AR or equivalent meeting MIL specifica- tion MIL-A-907)	S-NT779	Lubricates oxygen sensor thread cleaning tool when reconditioning exhaust system threads.

< SYSTEM DESCRIPTION >

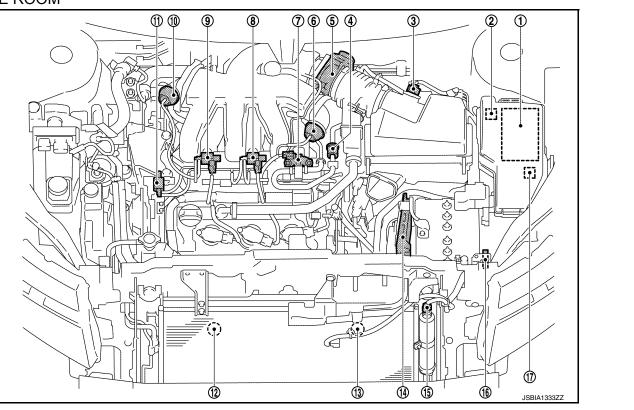
SYSTEM DESCRIPTION

COMPONENT PARTS

ENGINE CONTROL SYSTEM

ENGINE CONTROL SYSTEM : Component Parts Location

ENGINE ROOM



No.	Component	Function
1.	IPDM E/R	IPDM E/R activates the internal control circuit to perform the relay- ON-OFF control according to the input signals from various sen- sors and the request signals received from control units via CAN communication. Refer to <u>PCS-34, "Exploded View"</u> for detailed installationlocation.
2.	Cooling fan motor relay-3	EC-28, "Cooling Fan"
3.	Mass air flow sensor (with intake air temperature sensor)	EC-23, "Mass Air Flow Sensor (With Intake Air Temperature Sen- sor)"
4.	EVAP service port	_
5.	Electric throttle control actuator	EC-21. "Electric Throttle Control Actuator"
6.	Power valve actuator 2	EC-27, "Power Valve Actuator 1 and 2"
7.	EVAP canister purge volume control solenoid valve	EC-29, "EVAP Canister Purge Volume Control Solenoid Valve"
8.	VIAS control solenoid valve 2	EC-27, "VIAS Control Solenoid Valve 1 and 2"
9.	VIAS control solenoid valve 1	EC-27, "VIAS Control Solenoid Valve 1 and 2"
10.	Power valve actuator 1	EC-27, "Power Valve Actuator 1 and 2"
11.	Electronic controlled engine mount control solenoid valve	EC-27, "Electronic Controlled Engine Mount"
12.	Cooling fan motor-2	EC-28, "Cooling Fan"
13.	Cooling fan motor-1	EC-28, "Cooling Fan"
14.	ECM	EC-20, "ECM"

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[VQ35DE]

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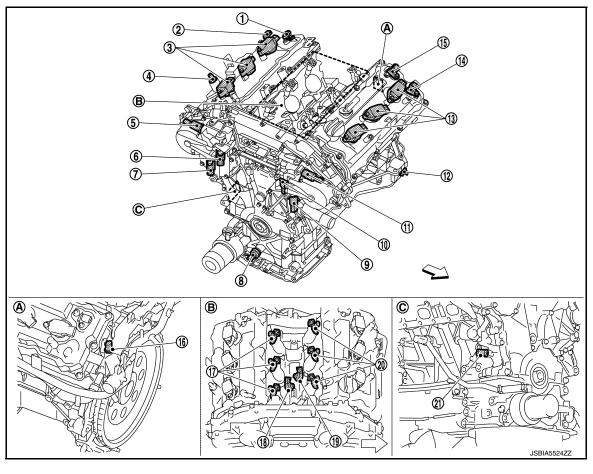
Revision: October 2015

< SYSTEM DESCRIPTION >

No.	Component	Function
15.	Refrigerant pressure sensor	EC-28, "Refrigerant Pressure Sensor" Refer to <u>HA-43, "Exploded View"</u> for detailed installationlocation.
16.	Battery current sensor (With Battery Temperrature Sensor)*	EC-28, "Battery Current Sensor (With Battery Temperature Sen- sor)"
17.	Cooling fan motor relay-2	EC-28, "Cooling Fan"

*: Not used for engine control system.

ENGINE



- A Engine rear upper-left
- B Engine top center
- © Engine front lower-right

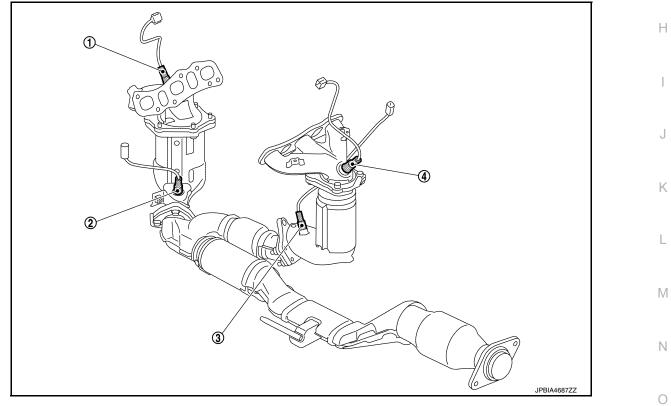
No.	Component	Function
1	Camshaft position sensor (PHASE) (bank 1)	EC-24, "Camshaft Position Sensor (PHASE)"
2	Exhaust valve timing control position sensor (bank 1)	EC-25. "Exhaust Valve Timing Control Position Sensor"
3	Ignition coil (with power transistor) (bank 1)	EC-22, "Ignition Coil (With Power Transistor)"
4	PCV valve	EC-32, "Positive Crankcase Ventilation (PCV)"
5	Intake valve timing intermediate lock control solenoid valve (bank 1)	EC-25. "Intake Valve Timing Intermediate Lock Control Solenoid Valve"
6	Intake valve timing control solenoid valve (bank 1)	EC-25, "Exhaust Valve Timing Control Solenoid Valve"
$\overline{\mathcal{O}}$	Exhaust valve timing control solenoid valve (bank 1)	EC-25, "Exhaust Valve Timing Control Solenoid Valve"
8	Engine oil pressure sensor	EC-26. "Engine Oil Pressure Sensor"

< SYSTEM DESCRIPTION >

[VQ35DE]

No.	Component	Function	٨
9	Exhaust valve timing control solenoid valve (bank 2)	EC-25, "Exhaust Valve Timing Control Solenoid Valve"	A
10	Intake valve timing control solenoid valve (bank 2)	EC-25, "Intake Valve Timing Control Solenoid Valve"	
11	Intake valve timing intermediate lock control solenoid valve (bank 2)	EC-25. "Intake Valve Timing Intermediate Lock Control Solenoid Valve"	EC
12	Crankshaft position sensor (POS)	EC-24, "Crankshaft Position Sensor (POS)"	
13	Ignition coil (with power transistor) (bank 2)	EC-22, "Ignition Coil (With Power Transistor)"	С
14)	Exhaust valve timing control position sensor (bank 2)	EC-25. "Exhaust Valve Timing Control Position Sensor"	
(15)	Camshaft position sensor (PHASE) (bank 2)	EC-24, "Camshaft Position Sensor (PHASE)"	D
16	Engine coolant temperature sensor	EC-26, "Engine Coolant Temperature Sensor"	
17	Fuel injector (bank 1)	EC-23, "Fuel Injector"	Е
(18)	Knock sensor (bank 1)	EC-27, "Knock Sensor"	
(19)	Knock sensor (bank 2)	EC-27, "Knock Sensor"	F
20	Fuel injector (bank 2)	EC-23. "Fuel Injector"	
21	Engine oil temperature sensor	EC-26. "Engine Oil Temperature Sensor"	G

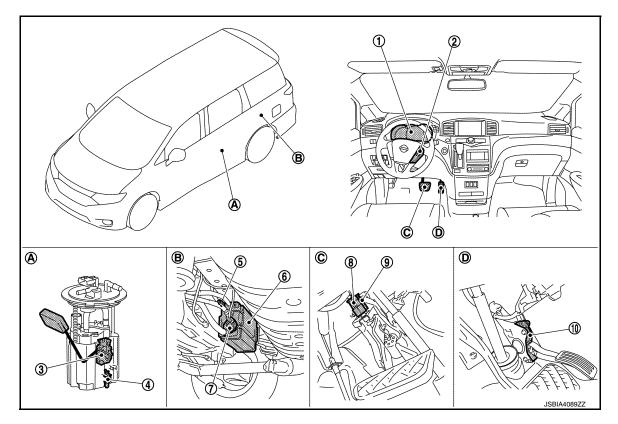
EXHAUST



No.	Component	Function	
1.	Air fuel ratio (A/F) sensor 1 (bank 2)	EC-29, "Air Fuel Ratio (A/F) Sensor 1"	
2.	Heated oxygen sensor 2 (bank 2)	EC-30, "Heated Oxygen Sensor 2"	Ρ
3.	Heated oxygen sensor 2 (bank 1)	EC-30, "Heated Oxygen Sensor 2"	
4.	Air fuel ratio (A/F) sensor 1 (bank 1)	EC-29, "Air Fuel Ratio (A/F) Sensor 1"	

BODY

< SYSTEM DESCRIPTION >



- A. Fuel tank top center
- B. Rear suspension member periphery C. Pedal periphery
- D. Pedal periphery

No.		Component	Function	
		Malfunction indicator lamp (MIL)	EC-21, "Malfunction Indicator lamp (MIL)"	
1.	Combination meter	Information display	The operation mode of the ASCD is indicated on the information display in the combination meter. ECM transmits the status signal to the combination meter via CAN communication according to ASCD operation.	
2.	ASCD steering switch	I	EC-31, "ASCD Steering Switch"	
3.	Fuel level sensor unit and fuel pump		EC-30, "Fuel Level Sensor Unit and Fuel Pump" Refer to FL-6, "Exploded View" for detailed installationlocation.	
4.	Fuel tank temperature	e sensor	EC-31, "Fuel Tank Temperature Sensor"	
5.	EVAP canister vent control valve		EC-29. "EVAP Canister Vent Control Valve"	
6.	EVAP canister		EC-29. "EVAP Canister Vent Control Valve"	
7.	EVAP control system pressure sensor		EC-29, "EVAP Control System Pressure Sensor"	
8.	Brake pedal position switch		EC 21 "Stan Lamp Switch & Broke Dadel Desition Switch"	
9.	Stop lamp switch		 <u>EC-31, "Stop Lamp Switch & Brake Pedal Position Switch"</u> 	
10.	Accelerator pedal pos	ition sensor	EC-21, "Accelerator Pedal Position Sensor"	

ECM

INFOID:000000012406248

• ECM (Engine Control Module) controls the engine.

• ECM consists of a microcomputer and connectors for signal input and output and for power supply.

• 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.

Malfunction Indicator lamp (MIL)

< SYSTEM DESCRIPTION >

Malfunction Indicator lamp (MIL) is located on the combination meter.

MIL will illuminate when the ignition switch is turned ON without the engine running. This is a bulb check.

When the engine is started, MIL should turn OFF. If the MIL remains illuminated, the on board diagnostic system has detected an engine system malfunction.

For details, refer to EC-62, "Diagnosis Description".

Accelerator Pedal Position Sensor

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.

Electric Throttle Control Actuator

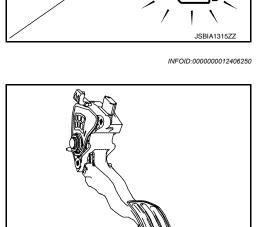
OUTLINE

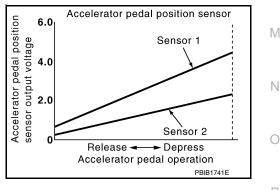


SERVICE

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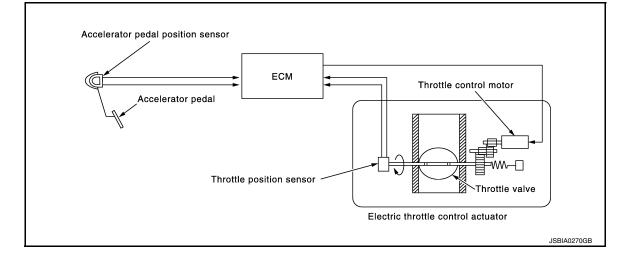
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< SYSTEM DESCRIPTION >

Electric throttle control actuator consists of throttle body, throttle valve, throttle control motor and throttle position sensor.



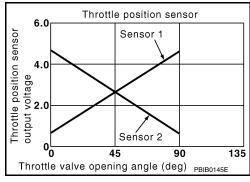
THROTTLE CONTROL MOTOR

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.

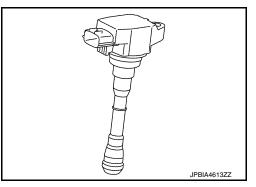
THROTTLE POSITION SENSOR

The throttle position sensor responds to the throttle valve movement. The throttle position sensor has two sensors. These sensors are a kind of potentiometers which transform the throttle valve position into output voltage, and emit the voltage signal to the ECM. In addition, these sensors detect the opening and closing speed of the throttle valve and feed the voltage signals to the ECM. The ECM judges the current opening angle of the throttle valve from these signals and the ECM controls the throttle control motor to make the throttle valve opening angle properly in response to driving condition.



Ignition Coil (With Power Transistor)

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.



< SYSTEM DESCRIPTION >

Fuel Injector

The fuel injector is a small, precise solenoid valve. When the ECM supplies a ground to the fuel injector circuit, the coil in the fuel injector is energized. The energized coil pulls the ball valve back and allows fuel to flow through the fuel injector into the intake manifold. The amount of fuel injected depends upon the injection pulse duration. Pulse duration is the length of time the fuel injector remains open. The ECM controls the injection pulse duration based on engine fuel needs.

Mass Air Flow Sensor (With Intake Air Temperature Sensor)

MASS AIR FLOW SENSOR

The mass air flow sensor (1) is placed in the stream of intake air. It measures the intake flow rate by measuring a part of the entire intake flow. The mass air flow sensor controls the temperature of the hot wire to a certain amount. The heat generated by the hot wire is reduced as the intake air flows around it. The more air, the greater the heat loss.

Therefore, the electric current supplied to hot wire is changed to maintain the temperature of the hot wire as air flow increases. The ECM detects the air flow by means of this current change.

INTAKE AIR TEMPERATURE SENSOR

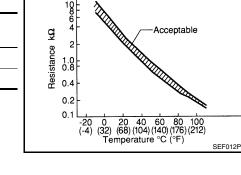
The intake air temperature sensor is built-into mass air flow sensor. The sensor detects intake air temperature and transmits a signal to the ECM.

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.

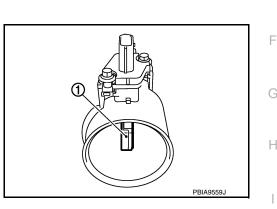
<Reference data>

Intake air temperature [°C (°F)]	Voltage [*] (V)	Resistance (k Ω)
25 (77)	3.3	1.800 - 2.200
80 (176)	1.2	0.283 - 0.359

*: These data are reference values and are measured between ECM terminals.



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< SYSTEM DESCRIPTION >

Camshaft Position Sensor (PHASE)

The camshaft position sensor (PHASE) senses the retraction of intake 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.

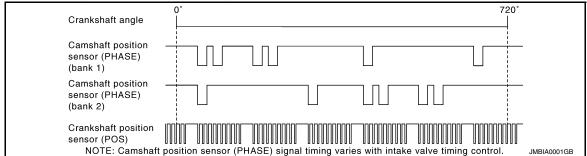
The sensor consists of a permanent magnet and Hall IC.

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.

ECM receives the signals as shown in the figure.



Crankshaft Position Sensor (POS)

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.

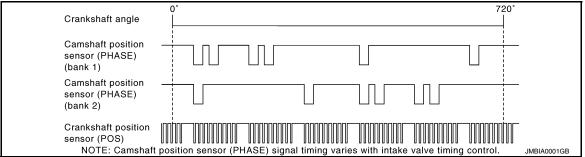
When the engine is running, the high and low parts of the teeth cause the gap with the sensor to change.

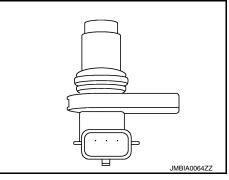
The changing gap causes the magnetic field near the sensor to change.

Due to the changing magnetic field, the voltage from the sensor changes.

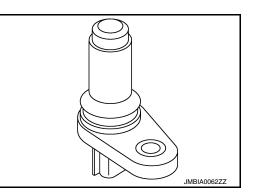
The ECM receives the voltage signal and detects the fluctuation of the engine revolution.

ECM receives the signals as shown in the figure.





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< SYSTEM DESCRIPTION >

Intake Valve Timing Control Solenoid Valve

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.

Intake Valve Timing Intermediate Lock Control Solenoid Valve

Intake valve timing intermediate lock control solenoid valve is activated by ON/OFF signals from the ECM.

The intake valve timing intermediate lock control solenoid valve opens/closes the path of oil pressure acting on the lock pin in the camshaft sprocket (INT).

- When the solenoid valve becomes ON, oil pressure to the lock pin is drained to perform intermediate lock.
- When the solenoid valve becomes OFF, oil pressure is acted on the lock pin to release the intermediate lock.

Exhaust Valve Timing Control Position Sensor

Exhaust valve timing control position sensor detects the protrusion of the signal plate installed to the exhaust camshaft front end.

This sensor signal is used for sensing a position of the exhaust camshaft.

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.

Exhaust Valve Timing Control Solenoid Valve

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

The exhaust valve timing control solenoid valve changes the oil amount and direction of flow through exhaust valve timing control unit or stops oil flow.

The longer pulse width retards valve angle.

The shorter pulse width advances valve angle.

When ON and OFF pulse widths become equal, the solenoid valve stops oil pressure flow to fix the exhaust valve angle at the control position.

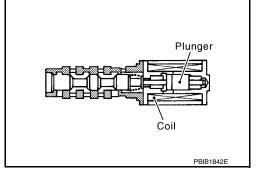
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Plunger

PBIB1842E



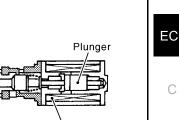
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Coil

< SYSTEM DESCRIPTION >

Engine Coolant Temperature Sensor

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 terminals.

Engine Oil Pressure Sensor

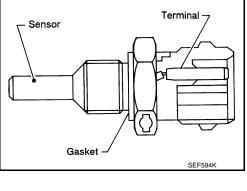
The engine oil pressure (EOP) sensor is detects engine oil pressure and transmits a voltage signal to the ECM.

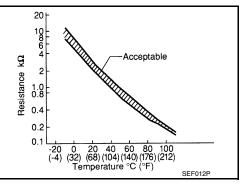
Engine Oil Temperature Sensor

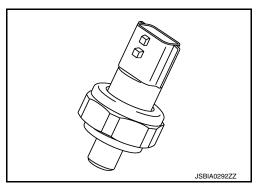
The engine oil temperature sensor is used to detect the engine oil temperature. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the engine oil temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance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



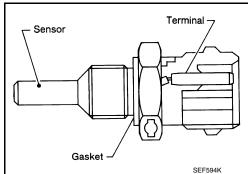
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1.0 0.8 0.4 0.2 0.1

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Resistance

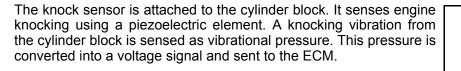
< SYSTEM DESCRIPTION >

<Reference data>

Engine oil temperature [°C (°F)]	Voltage [*] (V)	Resistance (k Ω)
-10 (14)	4.4	7.0 - 11.4
20 (68)	3.5	2.37 - 2.63
50 (122)	2.2	0.68 - 1.00
90 (194)	0.9	0.236 - 0.260
110 (230)	0.6	0.143 - 0.153

*: These data are reference values and are measured between ECM terminals.

Knock Sensor



VIAS Control Solenoid Valve 1 and 2

The VIAS control solenoid valve cuts the intake manifold vacuum signal for power valve control. It responds to ON/OFF signals from the ECM. When the solenoid is OFF, the vacuum signal from the intake manifold is cut. When the ECM sends an ON signal the coil pulls the plunger downward and sends the vacuum signal to the power valve actuator.

Power Valve Actuator 1 and 2

The power valves are used to control the suction passage of the variable induction air control system. They are set in the fully closed or fully opened position by the power valve actuators operated by the vacuum stored in the vacuum tank. The vacuum to power valve actuators is controlled by the VIAS control solenoid valves.

Electronic Controlled Engine Mount

In the idle range, ECM turns OFF the electronically-controlled engine mount control solenoid valve and applies manifold pressure to the electronically-controlled engine mount. This decreases damping force of the electronically-controlled engine mount and absorbs vibrations traveling from the engine to the body for improving the quietness.

In the driving range, ECM turns ON the electronically-controlled engine mount control solenoid valve and cuts manifold pressure applied on the electronically-controlled engine mount. This increases damping force of the electronically-controlled engine mount and reduces vibrations generated during driving.

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Acceptable

0 20 40 60 80 100 (32) (68) (104) (140) (176) (212) Temperature °C (°F)

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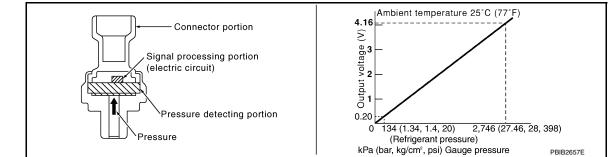
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< SYSTEM DESCRIPTION >

Refrigerant Pressure Sensor

INFOID:000000012406268

The refrigerant pressure sensor is installed at the condenser of the air conditioner system. The sensor uses an electrostatic volume pressure transducer to convert refrigerant pressure to voltage. The voltage signal is sent to ECM, and ECM controls cooling fan system.

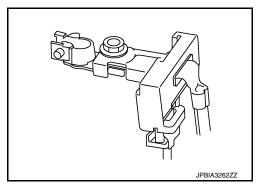


Battery Current Sensor (With Battery Temperature Sensor)



BATTERY CURRENT SENSOR

The battery current sensor is installed to the battery cable at the negative terminal. The sensor measures the charging/discharging current of the battery.



BATTERY TEMPERATURE SENSOR

Battery temperature sensor is integrated in battery current sensor. The sensor measures temperature around the battery.

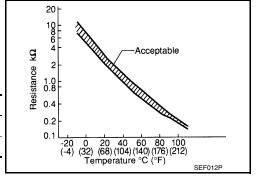
The electrical resistance of the thermistor decreases as temperature increases.

<Reference data>

Temperature [°C (°F)]	Voltage* (V)	Resistance (k Ω)
25 (77)	3.333	1.9 - 2.1
90 (194)	0.969	0.222 - 0.258

*: These data are reference values and are measured between battery temperature sensor signal terminal and sensor ground.

Cooling Fan



INFOID:000000012406270

DESCRIPTION

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 4-step control [HIGH/MIDDLE/LOW/OFF]. Refer to <u>EC-47. "COOLING FAN CONTROL : System Description"</u> for cooling fan operation.

COOLING FAN MOTOR RELAY

Power supply for the cooling fan motor is provided via cooling fan motor relay.

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. For details, refer to EC-51, "EVAPORATIVE EMISSION SYSTEM : System Description".

Revision: October 2015



< SYSTEM DESCRIPTION >

EVAP Canister Purge Volume Control Solenoid Valve

The EVAP canister purge volume control solenoid valve is used to control the flow rate of fuel vapor from the EVAP canister. The EVAP canister purge volume control solenoid valve is moved by ON/OFF pulses from the ECM. The longer the ON pulse, the greater the amount of fuel vapor that will flow through the valve.

EVAP Canister Vent Control Valve

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.

EVAP Control System Pressure Sensor

The EVAP control system pressure sensor detects pressure in the purge line. The sensor output voltage to the ECM increases as pressure increases.

Air Fuel Ratio (A/F) Sensor 1

DESCRIPTION

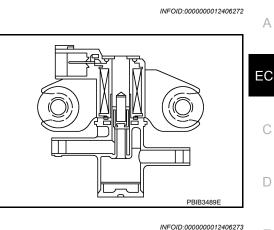
The air fuel ratio (A/F) sensor 1 is a planar one-cell limit current sensor. The sensor element of the A/F sensor 1 is composed an electrode layer, which transports ions. It has a heater in the element.

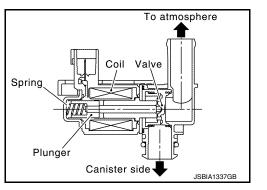
The sensor is capable of precise measurement λ = 1, but also in the lean and rich range. Together with its control electronics, the sensor outputs a clear, continuous signal throughout a wide λ range.

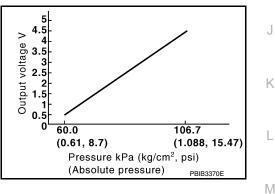
The exhaust gas components diffuse through the diffusion layer at the sensor cell. An electrode layer is applied voltage, and this current relative oxygen density in lean. Also this current relative hydrocarbon density in rich.

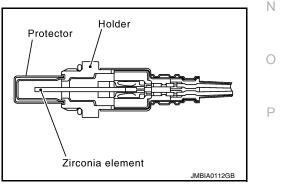














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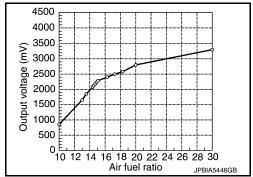




INFOID:000000012406274

< SYSTEM DESCRIPTION >

Therefore, the A/F sensor 1 is able to indicate air fuel ratio by this electrode layer of current. In addition, a heater is integrated in the sensor to ensure the required operating temperature of approximately $800^{\circ}C$ (1,472°F).



A/F SENSOR 1 HEATER

A/F sensor 1 heater is integrated in the sensor.

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

Heated Oxygen Sensor 2

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[VQ35DE]

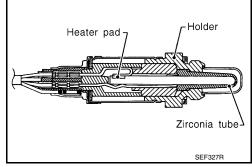
DESCRIPTION

The heated oxygen sensor 2, after three way catalyst (manifold), monitors the oxygen level in the exhaust gas.

Even if switching characteristics of the air fuel ratio (A/F) sensor 1 are shifted, the air fuel ratio is controlled to stoichiometric, by the signal from the heated oxygen sensor 2.

This sensor is made of ceramic zirconia. The zirconia generates voltage from approximately 1 V in richer conditions to 0 V in leaner conditions.

Under normal conditions the heated oxygen sensor 2 is not used for engine control operation.



HEATED OXYGEN SENSOR 2 HEATER

Heated oxygen sensor 2 heater is integrated in the sensor.

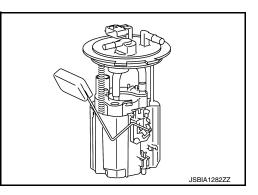
The ECM performs ON/OFF control of the heated oxygen sensor 2 heater corresponding to the engine speed, amount of intake air and engine coolant temperature.

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

Fuel Level Sensor Unit and Fuel Pump

FUEL PUMP

The ECM activates the fuel pump for 1 second after the ignition switch is turned ON to improve engine start ability. 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.



< SYSTEM DESCRIPTION >

Condition	Fuel pump operation	A
Ignition switch is turned to ON.	Operates for 1 second.	
Engine running and cranking	Operates.	
When engine is stopped	Stops in 1.5 seconds.	EC
Except as shown above	Stops.	

FUEL LEVEL SENSOR

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 via the CAN communication line. It consists of two parts, one is mechanical float and the other is variable resistor. Fuel level sensor output volt-

age changes depending on the movement of the fuel mechanical float.

Fuel Tank Temperature Sensor

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

<Reference data>

	Fluid temperature [°C (°F)]	Voltage* (V)	Resistance (kΩ)
-	20 (68)	3.5	2.3 - 2.7
	50 (122)	2.2	0.79 - 0.90

*: These data are reference values and are measured between ECM terminals 95 (Fuel tank temperature sensor) and ground.

ASCD Steering Switch

ASCD steering switch has variant values of electrical resistance for each button. ECM reads voltage variation of switch, and determines which button is operated. Refer to EC-46. "AUTOMATIC SPEED CONTROL DEVICE (ASCD) : System Description" for the ASCD func-

tion.

Stop Lamp Switch & Brake Pedal Position Switch

Stop lamp switch and brake pedal position switch are installed to brake pedal bracket. ECM detects the state of the brake pedal by those two types of input (ON/OFF signal).

Brake pedal	Brake pedal position switch	Stop lamp switch	
Released	ON	OFF	N
Depressed	OFF	ON	N



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20 10 8 6 Acceptable ĝ Resistance 1.0 0.4 0.2 Н 0. 0 20 40 60 80 100 (32) (68) (104) (140) (176) (212) -20 (-4) Temperature °C (°F) SEF012P



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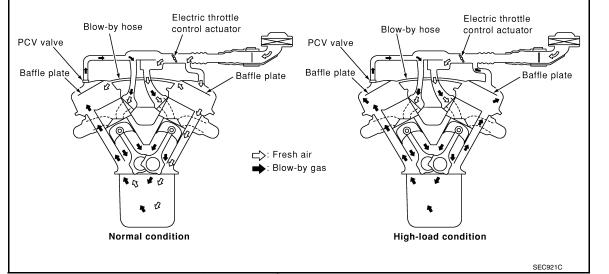
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< SYSTEM DESCRIPTION >

STRUCTURE AND OPERATION

Positive Crankcase Ventilation (PCV)



This system returns blow-by gas to the intake manifold.

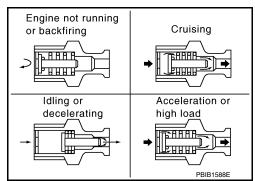
The positive crankcase ventilation (PCV) valve is provided to conduct crankcase blow-by gas to the intake manifold.

During partial throttle operation of the engine, the intake manifold sucks the blow-by gas through the PCV valve.

Normally, the capacity of the valve is sufficient to handle any blow-by and a small amount of ventilating air. The ventilating air is drawn from the air inlet tubes into the crankcase. In this process the air passes through the hose connecting air inlet tubes to rocker cover.

Under full-throttle condition, the manifold vacuum is insufficient to draw the blow-by flow through the valve. The flow goes through the hose connection in the reverse direction.

On vehicles with an excessively high blow-by, the valve does not meet the requirement. This is because some of the flow will go through the hose connection to the air inlet tubes under all conditions.



STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >

On



< STSTEM DESCRIPTION >	
On Board Refueling Vapor Recovery (ORVR)	INFOID:000000012406282
EVAP/ORVR line To EVAP canister purge volume control solenoid valve EVAP canister Fuel tank Fuel tank Arrian State Fuel tank Refueling EVAP vapor cut valve	Recirculation line One-way fuel valve
From the beginning of refueling, the air and vapor inside the fuel tank go throuvalve and EVAP/ORVR line to the EVAP canister. The vapor is absorbed by the released to the atmosphere.	igh refueling EVAP vapor cut EVAP canister and the air is
When the refueling has reached the full level of the fuel tank, the refueling EVAP refueling is stopped because of auto shut-off. The vapor which was absorbed by during driving.	
WARNING:	
 When conducting inspections below, be sure to observe the following: Put a "CAUTION: FLAMMABLE" sign in workshop. 	
 Never smoke while servicing fuel system. Keep open flames and sparks a Always to furnish the workshop with a CO₂ fire extinguisher. CAUTION: 	away from work area.

- Before removing fuel line parts, carry out the following procedures:
- Put drained fuel in an explosion-proof container and put lid on securely.
- Release fuel pressure from fuel line. Refer to EC-153, "Work Procedure".
- Disconnect battery ground cable.
- Always replace O-ring when the fuel gauge retainer is removed.
- Never kink or twist hose and tube when they are installed.
- Never tighten hose and clamps excessively to avoid damaging hoses.
- After installation, run engine and check for fuel leakage at connections.
- Never attempt to top off the fuel tank after the fuel pump nozzle shuts off automatically. Continued refueling may cause fuel overflow, resulting in fuel spray and possibly a fire.

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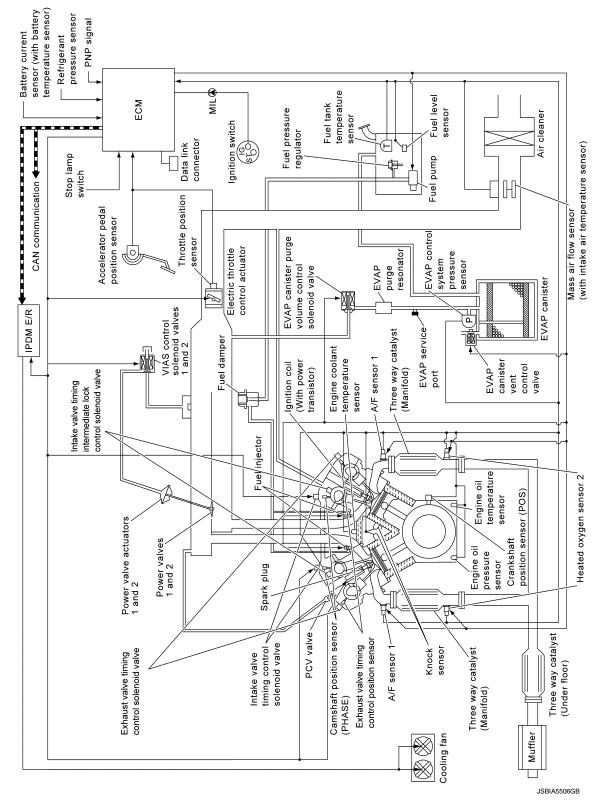
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SYSTEM ENGINE CONTROL SYSTEM

ENGINE CONTROL SYSTEM : System Description

INFOID:000000012406283

SYSTEM DIAGRAM



SYSTEM DESCRIPTION

SYSTEM

< SYSTEM DESCRIPTION >

ECM controls the engine by various functions.

Function	Reference	
MULTIPORT FUEL INJECTION SYSTEM	EC-42, "MULTIPORT FUEL INJECTION SYSTEM : System De- scription"	EC
ELECTRIC IGNITION SYSTEM	EC-44, "ELECTRIC IGNITION SYSTEM : System Description"	
AIR CONDITIONING CUT CONTROL	EC-45, "AIR CONDITIONING CUT CONTROL : System Descrip- tion"	С
AUTOMATIC SPEED CONTROL DEVICE (ASCD)	EC-46, "AUTOMATIC SPEED CONTROL DEVICE (ASCD) : Sys- tem Description"	-
COOLING FAN CONTROL	EC-47, "COOLING FAN CONTROL : System Description"	D
ELECTRONIC CONTROLLED ENGINE MOUNT	EC-48. "ELECTRONIC CONTROLLED ENGINE MOUNT : Sys- tem Description"	-
EVAPORATIVE EMISSION SYSTEM	EC-51. "EVAPORATIVE EMISSION SYSTEM : System Descrip- tion"	E
INTAKE VALVE TIMING CONTROL	EC-51, "INTAKE VALVE TIMING CONTROL : System Description"	
EXHAUST VALVE TIMING CONTROL	EC-54, "EXHAUST VALVE TIMING CONTROL : System Descrip- tion"	F
FUEL FILLER CAP WARNING SYSTEM	EC-55, "FUEL FILLER CAP WARNING SYSTEM : System De- scription"	G
CAN COMMUNICATION	EC-57. "CAN COMMUNICATION : System Description"	-

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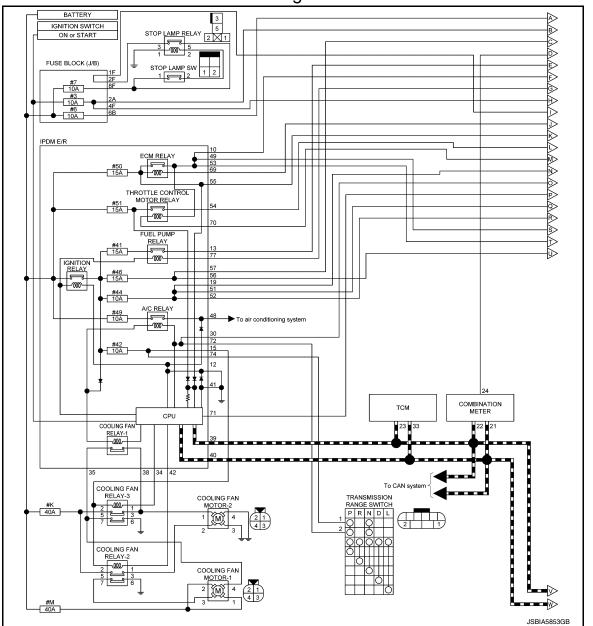
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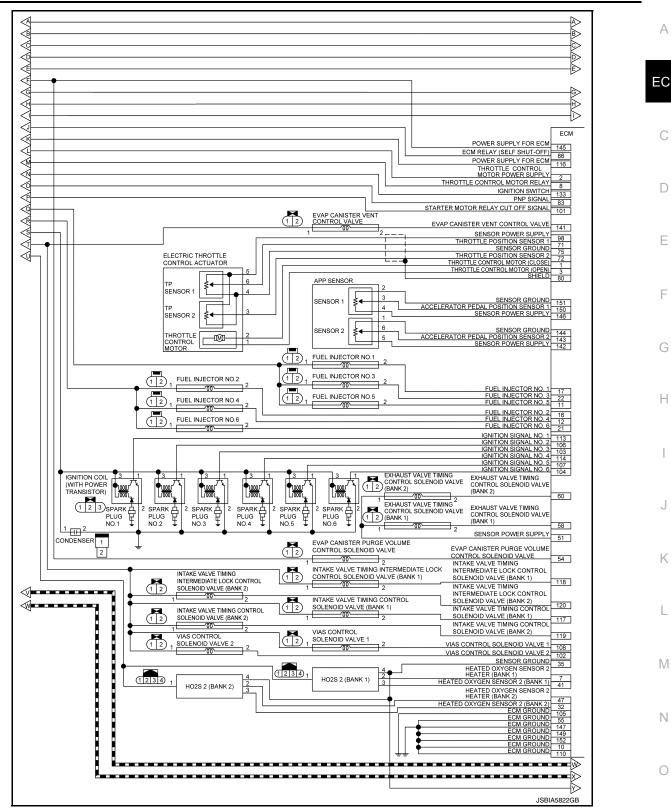




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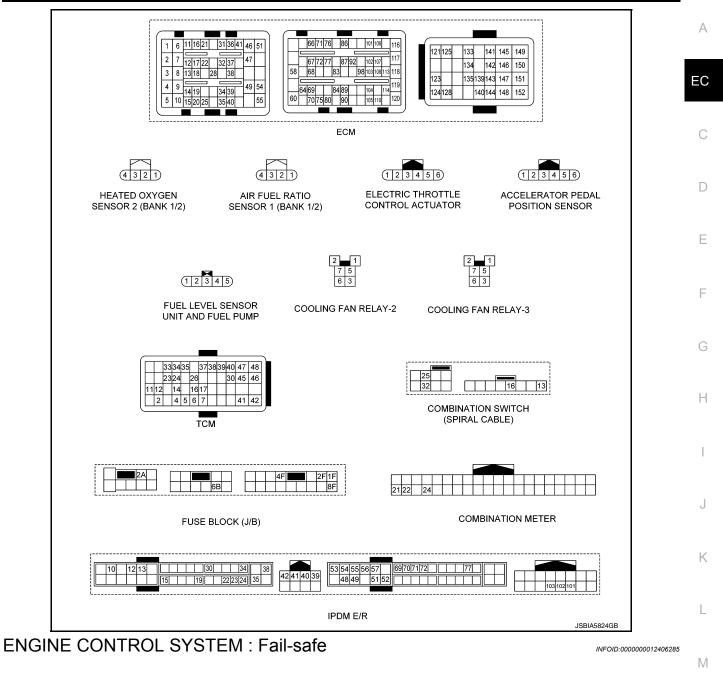
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[VQ35DE]

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		7
	ASCD STEERING SWITCH MAIN (ONOFF)	
M 139	STOP LAMP SWITCH	
124	ASCD STEERING SWITCH 25 COMBINATION 13 SET/COAST SENSOR GROUND 32 SWITCH 5 SET/COAST	
140		T
00	2 TMINIC CONTROL EXHAUST VALVE TIMING CONTROL POSITION SENSOR (BANK 2) 3 SENSOR POWER SUPPLY (BANK 2)	
40		
	CRANKSHAFT POSITION SENSOR (POS)	
	MAF SENSOR	
34	SENSOR GROUND	
	MASS AIR FLOW SENSOR	
92	SENSOR POWER SUPPLY 1 SENSOR GROUND 2 CMMSHAFT POSITION SENSOR (PHASE) (BANK 1) 3 (BANK 1) 3	
84	CAMSHAFT POSITION SENSOR (PHASE) (BANK 1)	
89	CAMSHAFT POSITION SENSOR (PHASE) (BANK 2) 3 (BANK 2) 1 2 3	
07	SENSOR POWER SUPPLY BATTERY CURRENT SENSOR	
68 64	BATTERY TEMPERATURE SENSOR EASTERY TEMPERATURE SENSOR BATTERY CURRENT SENSOR 2 SENSOR 3 4	
148		
121	EVAP CONTROL SYSTEM PRESSURE SENSOR 2 SENSOR POWER SUPPLY 3 SENSOR	
5		
	(BANK 2)	
	ENGINE COOLANT TEMPERATURE SENSOR	
13	engine oil temperature sensor	
14	ENGINE OIL PRESSURE SENSOR 2 ENGINE OIL 3 PRESSURE SENSOR 1 2 3	
20	SENSOR POWER SUPPLY 103 1 REFRIGERANT PRESSURE SENSOR 23 IPDM E/R 102 2 REFRIGERANT A DESCRIPTION OF A DE	
25	SENSOR GROUND 22 101 3 PRESSURE SENSOR (3 2 1) FUEL LEVEL SENSOR	
	4 UNIT AND FUEL PUMP	
128	FUEL TANK TEMPERATURE SENSOR	_
49	MOUNT CONTROL SOLENOID VALVE MOUNT CONTROL SHIFLD	
67	A/F SENSOR 1 (BANK 1)	
6		
76 46	A/F SENSOR 1 (BANK 2) A/F SENSOR 1 HEATER (BANK 2)	
124		
123		
	DATA LINK 5 14 16	
	CONNECTOR 4 4 5 6 8	

< SYSTEM DESCRIPTION >

[VQ35DE]



DTC No.	Detected items	Engine operating condition in fail-safe mode
P0011 P0021	Intake valve timing control	The signal is not energized to the intake valve timing control solenoid valve and the valve control does not function.
P0014 P0024	Exhaust valve timing con- trol	The signal is not energized to the exhaust valve timing control solenoid valve and the valve control does not function.
P0101 P0102 P0103	Mass air flow sensor circuit	Engine speed will not rise more than 2,400 rpm due to the fuel cut.

< SYSTEM DESCRIPTION >

DTC No.	Detected items	Engine operating condition in fail-safe mode			
P0117 P0118	Engine coolant tempera- ture sensor circuit	Engine coolant temperature will be CONSULT displays the engine cool	determined by ECM based on the following condition. lant temperature decided by ECM.		
		Condition	Engine coolant temperature decided (CONSULT display)		
		Just as ignition switch is turned ON or START	40°C (104°F)		
		Approx 4 minutes or more after en- gine starting	80°C (176°F)		
		Except as shown above	40 - 80°C (104 - 176°F) (Depends on the time)		
		When the fail-safe system for engine coolant temperature sensor is activated, the cooling fan operates while engine is running.			
P0122 P0123 P0222 P0223 P2135	Throttle position sensor	The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. Therefore, the acceleration will be poor.			
P0196 P0197 P0198	Engine oil temperature sensor	Intake valve timing control does not function.			
P0500	Vehicle speed sensor	The cooling fan operates (Highest) while engine is running.			
P052A P052B P052C P052D	Intake valve timing inter- mediate lock control	_			
P0603 P0607	ECM	Engine torque may be limited.			
P0604	ECM	 ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring. The position of the following components is fixed. Intake valve timing control solenoid valve Intake valve timing intermediate lock control solenoid valve Exhaust valve timing control solenoid valve ASCD operation may be deactivated. 			
P0605 P0606 P060B	ECM	 NOTE: Fail-safe may not occur depending on malfunction type. ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring. The position of the following components is fixed. Intake valve timing control solenoid valve Intake valve timing intermediate lock control solenoid valve Exhaust valve timing control solenoid valve ASCD operation may be deactivated. 			
P060A	ECM	 NOTE: Fail-safe may not occur depending on malfunction type. ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring. The position of the following components is fixed. Intake valve timing control solenoid valve Intake valve timing intermediate lock control solenoid valve Exhaust valve timing control solenoid valve Engine torque may be limited. ASCD operation may be deactivated. 			

< SYSTEM DESCRIPTION >

DTC No.	Detected items	Engine operating condition in fail-safe mode		
P0643	Sensor power supply	 ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring. The position of the following components is fixed. Intake valve timing control solenoid valve Intake valve timing intermediate lock control solenoid valve Exhaust valve timing control solenoid valve 		
P1805 Brake switch ECM controls the electric throttle control actuator by regulating the small range. Therefore, acceleration will be poor.				
		Vehicle condition	Driving condition	
		When engine is idling	Normal	
		When accelerating	Poor acceleration	
P2100 P2103	Throttle control motor relay	ECM stops the electric throttle cont fixed opening (approx. 5 degrees)	trol actuator control, throttle valve is maintained at a by the return spring.	
P2101	Electric throttle control function	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.		
P2118	Throttle control motor	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.		
tuator malfunction:)		ator does not function properly due to the return spring ctuator by regulating the throttle opening around the I not rise more than 2,000 rpm.		
			e in fail-safe mode is not in specified range:) ontrol actuator by regulating the throttle opening to 20	
		vehicle stops, the engine stalls.	lve is stuck open:) s slows down gradually because of fuel cut. After the P position, and engine speed will not exceed 1,000 rpm	
P2122 P2123 P2127 P2128 P2138	Accelerator pedal position sensor	The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. Therefore, the acceleration will be poor.		

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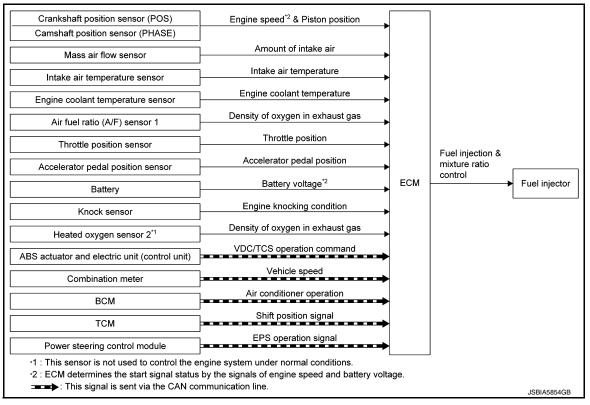
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< SYSTEM DESCRIPTION > MULTIPORT FUEL INJECTION SYSTEM : System Description

[VQ35DE]

INFOID:000000012406286

SYSTEM DIAGRAM



SYSTEM DESCRIPTION

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

VARIOUS FUEL INJECTION INCREASE/DECREASE COMPENSATION

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

<Fuel increase>

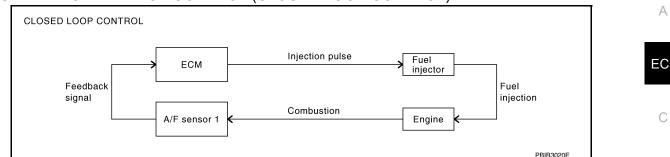
- During warm-up
- When starting the engine
- During acceleration
- Hot-engine operation
- When selector lever position is changed from N to D
- · High-load, high-speed operation

<Fuel decrease>

- During deceleration
- · During high engine speed operation

< SYSTEM DESCRIPTION >

MIXTURE RATIO FEEDBACK CONTROL (CLOSED LOOP CONTROL)



The mixture ratio feedback system provides the best air-fuel mixture ratio for drive ability and emission control. The three way catalyst (manifold) can better reduce CO, HC and NOx emissions. This system uses A/F sensor 1 in the exhaust manifold to monitor whether the engine operation is rich or lean. The ECM adjusts the injection pulse width according to the sensor voltage signal. For more information about A/F sensor 1, refer to EC-29. "Air Fuel Ratio (A/F) Sensor 1". This maintains the mixture ratio within the range of stoichiometric (ideal air-fuel mixture).

This stage is referred to as the closed loop control condition.

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

Open Loop Control

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

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

MIXTURE RATIO SELF-LEARNING CONTROL

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

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

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

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

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

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FUEL INJECTION TIMING

 Sequential multiport fuel injection system 	 Simultaneous multiport fuel injection system
o. 1 cylinder	
o. 2 cylinder — I	No. 2 cylinder
o. 3 cylinder —————————————————————	No. 3 cylinder
o. 4 cylinder L	No. 4 cylinder
p. 5 cylinder ————————————————————————————————————	No. 5 cylinder – L
o. 6 cylinder	No. 6 cylinder – I Legender – I Legender

Two types of systems are used.

Sequential Multiport Fuel Injection System

Fuel is injected into each cylinder during each engine cycle according to the ignition order. This system is used when the engine is running.

Simultaneous Multiport Fuel Injection System Fuel is injected simultaneously into all six cylinders twice each engine cycle. In other words, pulse signals of the same width are simultaneously transmitted from the ECM. The six injectors will then receive the signals 2 times for each engine cycle.

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

FUEL SHUT-OFF

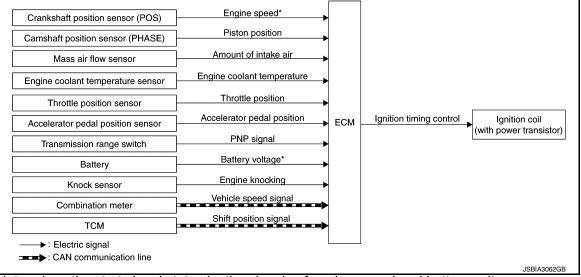
Fuel to each cylinder is cut off during deceleration, operation of the engine at excessively high speeds or operation of the vehicle at excessively high speeds.

ELECTRIC IGNITION SYSTEM

ELECTRIC IGNITION SYSTEM : System Description

INFOID:000000012406287

SYSTEM DIAGRAM



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

SYSTEM DESCRIPTION

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

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

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

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

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

Revision: October 2015

< SYSTEM DESCRIPTION >

[VQ35DE]

INFOID-000000012406288

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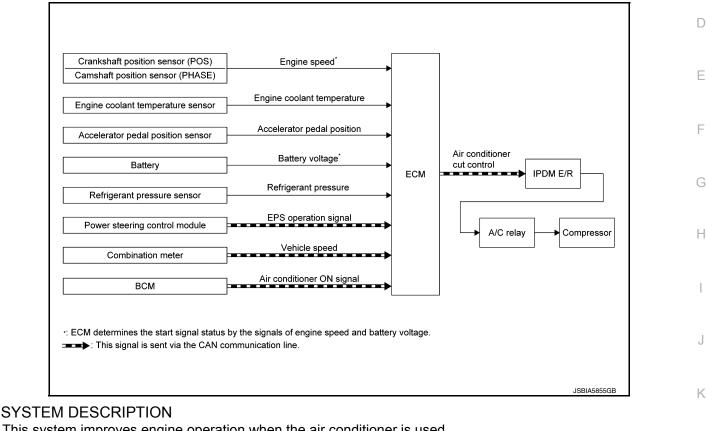
EC

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

AIR CONDITIONING CUT CONTROL : System Description

SYSTEM DIAGRAM



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.

AUTOMATIC SPEED CONTROL DEVICE (ASCD)

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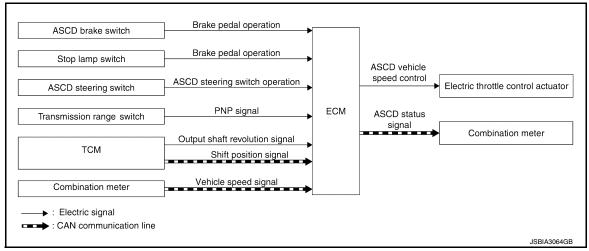
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< SYSTEM DESCRIPTION >

AUTOMATIC SPEED CONTROL DEVICE (ASCD) : System Description

INFOID:000000012406289

SYSTEM DIAGRAM



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 on combination meter. If any malfunction occurs in the ASCD system, it automatically deactivates control.

NOTE:

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

SET OPERATION

Press MAIN switch. (The CRUISE on 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/COAST switch.

ACCELERATE OPERATION

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

CANCEL OPERATION

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

- CANCEL switch is pressed
- More than 2 switches on ASCD steering switch are pressed at the same time (Set speed will be cleared)
- Brake pedal is depressed
- Selector lever position changed to N, P or R
- · Vehicle speed decreased to 13 km/h (8 MPH) lower than the set speed
- TCS system is operated
- CVT control system has a malfunction. Refer to EC-429. "Description".

· Engine coolant temperature is slightly higher than the normal operating temperature

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

· Malfunction for some self-diagnoses regarding ASCD control: CRUISE will blink quickly.

If MAIN switch is turned to OFF while ASCD is activated, all of ASCD operations will be canceled and vehicle speed memory will be erased.

COAST OPERATION

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

RESUME OPERATION

Revision: October 2015

When the RESUME/ACCELERATE switch is pressed after canceling operation other than pressing the 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

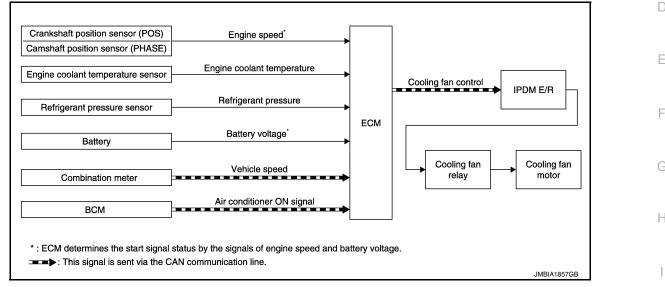
Selector lever position is other than P and N

Vehicle speed is greater than 40 km/h (25 MPH) and less than 144 km/h (89 MPH)

COOLING FAN CONTROL

COOLING FAN CONTROL : System Description

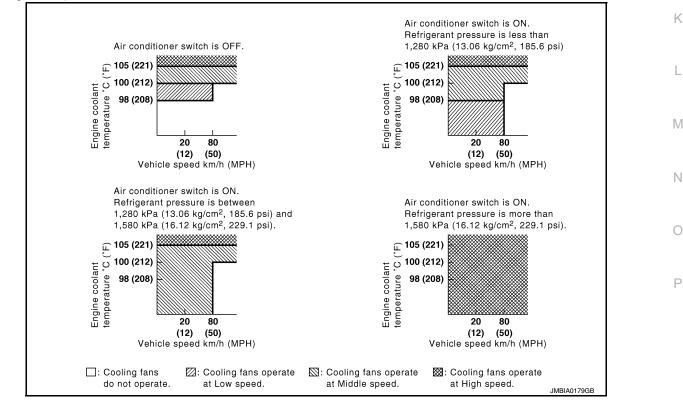
SYSTEM DIAGRAM



SYSTEM DESCRIPTION

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 4-step control [HIGH/MIDDLE/LOW/OFF].

Cooling Fan Operation



EC-47

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Revision: October 2015

SYSTEM

[VQ35DE]

Cooling Fan Relay Operation

The ECM controls cooling fan relays in the IPDM E/R through CAN communication line.

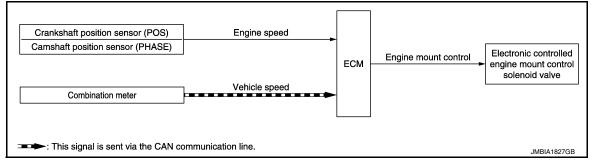
Cooling for spood	Cooling fan relay			
Cooling fan speed	1	2	3	
Stop (OFF)	OFF	OFF	OFF	
Low (LOW)	ON	OFF	OFF	
Middle (MID)	OFF	ON	OFF	
High (HI)	OFF	ON	ON	

ELECTRONIC CONTROLLED ENGINE MOUNT

ELECTRONIC CONTROLLED ENGINE MOUNT : System Description

INFOID:000000012406291

SYSTEM DIAGRAM

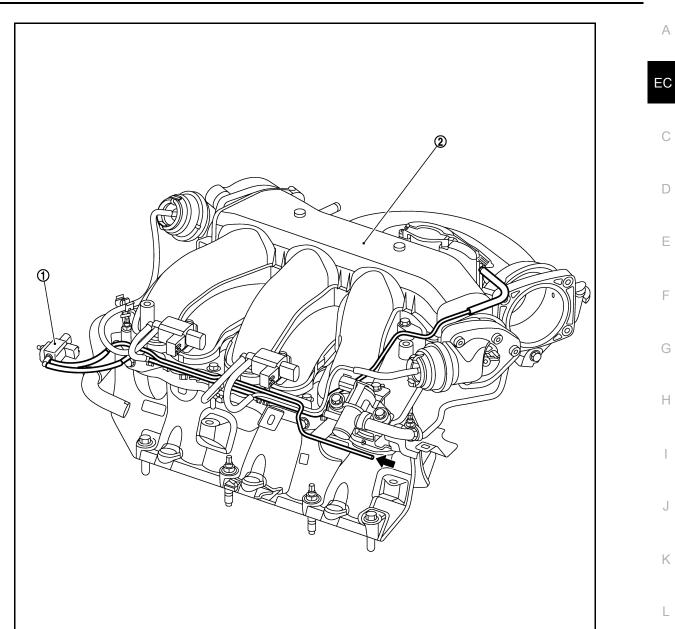


SYSTEM DESCRIPTION

The ECM controls the engine mount operation corresponding to the engine speed. The control system has a 2-step control [Soft/Hard]

Vehicle condition	Engine mount control
Idle (With vehicle stopped)	Soft
Except above conditions	Hard

ELECTRONIC CONTROLLED ENGINE MOUNT LINE DRAWING



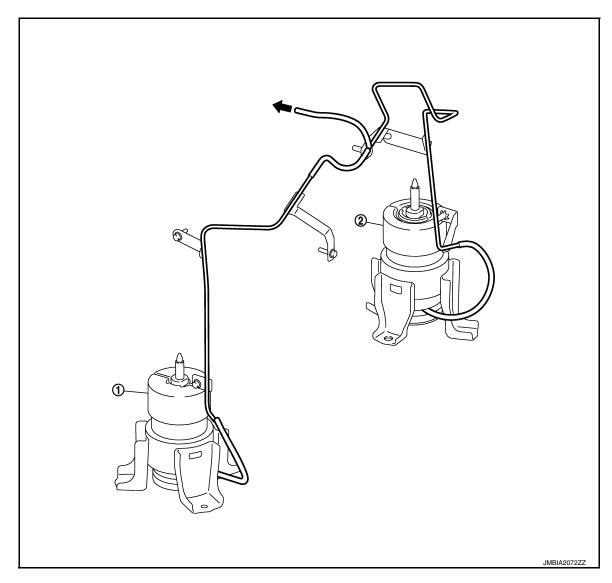
- 1. Electronic controlled engine mount 2. Intake manifold collector control solenoid valve
- = : From next figure

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- 1. Front electronic controlled engine mount 2. Rear electronic controlled engine mount
- To previous figure

NOTE:

Do not use soapy water or any type of solvent while installing vacuum hose. EVAPORATIVE EMISSION SYSTEM

< SYSTEM DESCRIPTION >

EVAPORATIVE EMISSION SYSTEM : System Description

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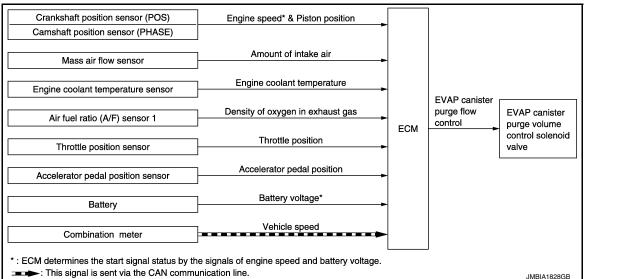
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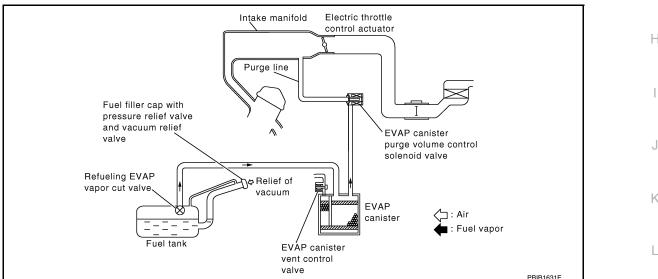
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SYSTEM DIAGRAM



SYSTEM DESCRIPTION



The evaporative emission system is used to reduce hydrocarbons emitted into the atmosphere from the fuel system. This reduction of hydrocarbons is accomplished by activated charcoals in the EVAP canister. The fuel vapor in the sealed fuel tank is led into the EVAP canister which contains activated carbon and the vapor is stored there when the engine is not operating or when refueling to the fuel tank.

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

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

INTAKE VALVE TIMING CONTROL

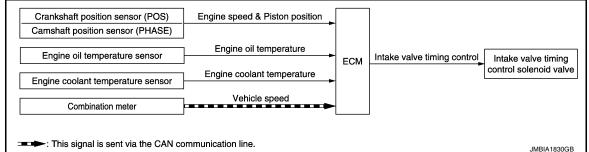
INTAKE VALVE TIMING CONTROL : System Description

INTAKE VALVE TIMING CONTROL

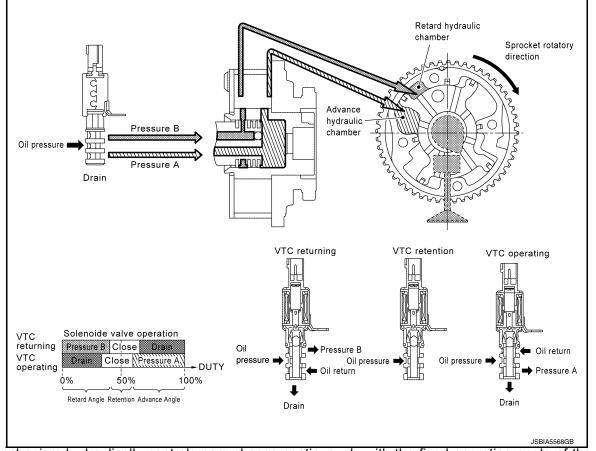
[VQ35DE]

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System Diagram







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

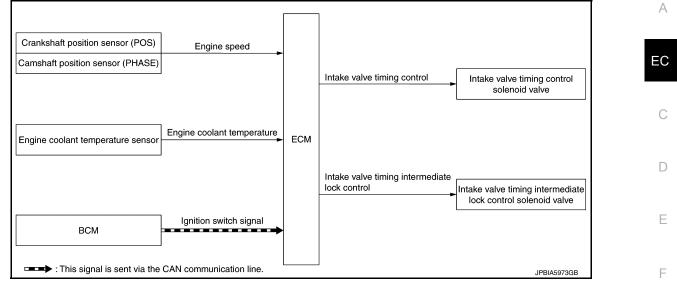
The ECM receives signals such as crankshaft position, camshaft position, engine speed, and engine coolant temperature. Then, the ECM sends ON/OFF pulse duty signals to the intake valve timing (IVT) control sole-noid valve depending on driving status. This makes it possible to control the shut/open timing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

INTAKE VALVE TIMING INTERMEDIATE LOCK CONTROL

< SYSTEM DESCRIPTION >

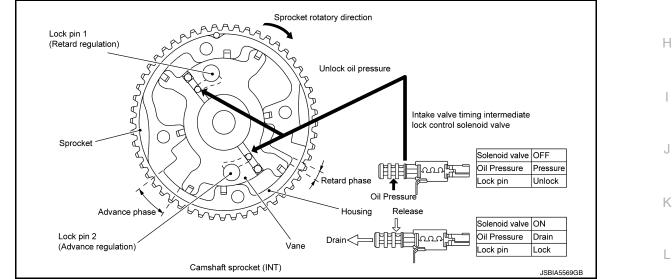
[VQ35DE]

System Diagram



System Description

The intake valve timing intermediate lock control improves the cleaning ability of exhaust gas at cold starting by fixing the camshaft sprocket (INT) with two lock pins and bringing the cam phase into intermediate phase.



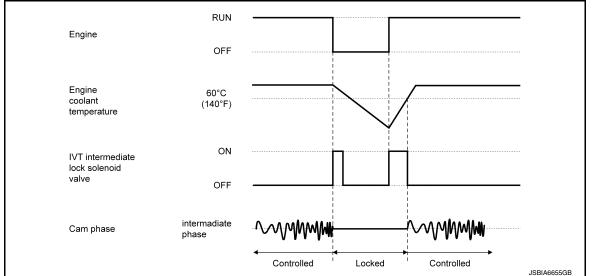
Cam phase is fixed at the intermediate phase by two lock pins in the camshaft sprocket (INT). ECM controls the intermediate phase lock by opening/closing the intake valve timing intermediate lock control solenoid valve to control oil pressure acting on the lock pins and locking/unlocking the lock pins.

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Lock/Unlock Activation



When the ignition switch is turned OFF from the idle state, ECM activates the intake valve timing intermediate lock control solenoid valve to drain oil pressure. Accordingly, the lock pins is activated by the spring, and the cam phase is fixed at the intermediate position.

When starting the engine by cold start, ECM activates the solenoid valve to maintain the condition that the cam phase is fixed at the intermediate position.

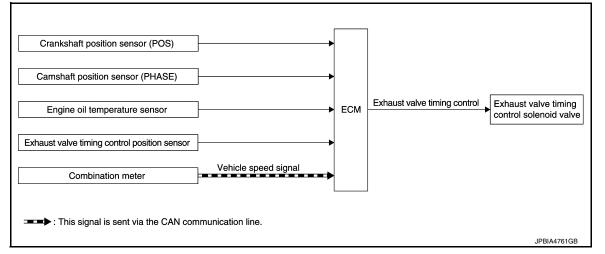
When the engine coolant temperature exceeds 60°C (140°F), ECM turns OFF the solenoid valve and starts normal intake valve timing control.

EXHAUST VALVE TIMING CONTROL

EXHAUST VALVE TIMING CONTROL : System Description

INFOID:000000012406294

SYSTEM DIAGRAM



INPUT/OUTPUT SIGNAL CHART

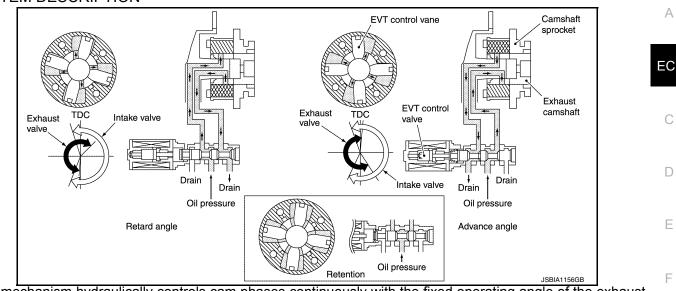
Sensor	Input signal to ECM		ECM function	Actuator	
Crankshaft position sensor (POS)	 Engine speed and piston position 		Exhaust valve timing control		
Camshaft position sensor (PHASE)				Exhaust valve timing control solenoid valve	
Engine oil temperature sensor	Engine oil temperature				
Exhaust valve timing control position sensor	Exhaust valve timing signal				
Combination meter	CAN commu- nication	Vehicle speed signal			



[VQ35DE]

INFOID:000000012406295

< SYSTEM DESCRIPTION > SYSTEM DESCRIPTION



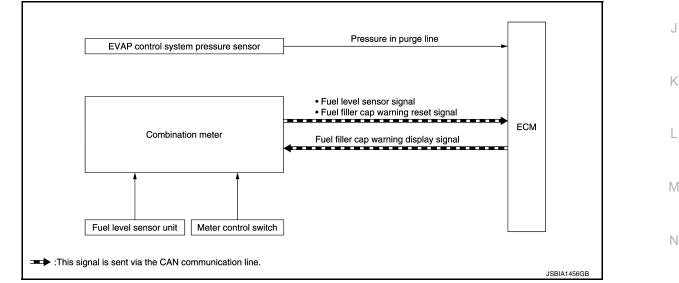
This mechanism hydraulically controls cam phases continuously with the fixed operating angle of the exhaust valve.

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

FUEL FILLER CAP WARNING SYSTEM

FUEL FILLER CAP WARNING SYSTEM : System Description

SYSTEM DIAGRAM



SYSTEM DESCRIPTION

The fuel filler cap warning system alerts the driver to the prevention of the fuel filler being left uncapped and malfunction occurrences after refueling, by turning ON the fuel filler cap warning display on the combination meter.

ECM judges a refueled state, based on a fuel level signal transmitted from the combination meter.

When a very small leak is detected through the EVAP leak diagnosis performed after judging the refueled state, ECM transmits a fuel filler cap warning display signal (request for display ON) to the combination meter via CAN communication.

When receiving the signal, the combination meter turns ON the fuel filler cap warning display. CAUTION:

Check fuel filler cap installation condition when the fuel filler cap warning display turns ON.



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Reset Operation

The fuel filler cap warning lamp tunes OFF, according to any condition listed below:

- Reset operation is performed by operating the meter control switch on the combination meter.
- When the reset operation is performed, the combination meter transmits a fuel filler cap warning reset signal to ECM via CAN communication. ECM transmits a fuel filler cap warning display signal (request for display OFF) to the combination meter via CAN communication. When receiving the signal, the combination meter turns OFF the fuel filler cap warning display.
- EVAP leak diagnosis result is normal.
- Fuel refilled.
- DTC erased by using CONSULT.

NOTE:

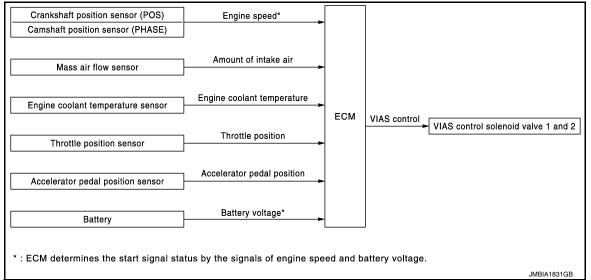
MIL turns ON if a malfunction is detected in leak diagnosis results again at the trip after the fuel filler cap warning display turns ON/OFF.

VARIABLE INDUCTION AIR SYSTEM

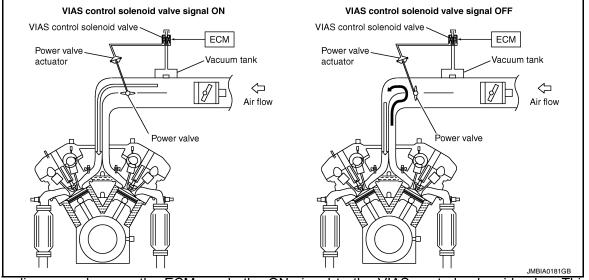
VARIABLE INDUCTION AIR SYSTEM : System Description

INFOID:000000012406296

SYSTEM DIAGRAM



SYSTEM DESCRIPTION



In the medium speed range, the ECM sends the ON signal to the VIAS control solenoid valve. This signal introduces the intake manifold vacuum into the power valve actuator and therefore closes the power valve. Under this condition, the pressure waves of the exhaust stroke do not disturb the pressure waves of the intake stroke of each opposite bank. Therefore, charging efficiency is increased together with the effect of the long intake passage.

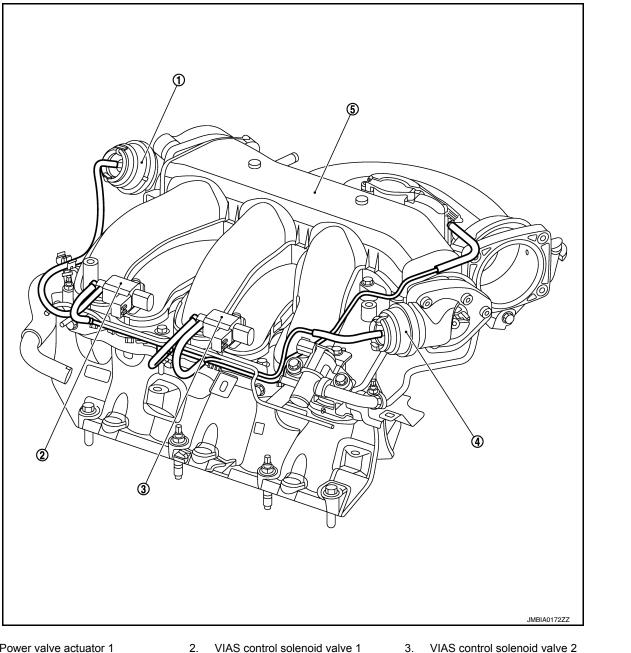
Revision: October 2015

< SYSTEM DESCRIPTION >

However, in the high speed range, the ECM sends the OFF signal to the VIAS control solenoid valve and the power valve is opened. Under this condition, the pressure waves of intake stroke are resonant with those of each opposite bank exhaust stroke. Therefore, charging efficiency is also increased.

In addition, both valves 1 and 2 are opened or closed in other ranges mentioned above. Thus maximum charging efficiency is obtained for the various driving conditions.

VACUUM HOSE DRAWING



- Power valve actuator 1 1.
- 4 Power valve actuator 2
- 2. VIAS control solenoid valve 1 5 Intake manifold collector
- CAN COMMUNICATION

CAN COMMUNICATION : System Description

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. 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

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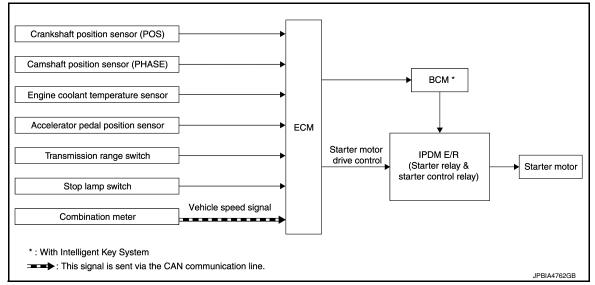
communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only. Refer to LAN-32, "CAN COMMUNICATION SYSTEM : CAN Communication Signal Chart", about CAN communication for detail.

STARTER MOTOR DRIVE CONTROL

STARTER MOTOR DRIVE CONTROL : System Description

INFOID:000000012406298

SYSTEM DIAGRAM



SYSTEM DESCRIPTION

When rapid deceleration occurs during engine runs or idle speed decreases due to heavy load conditions, ECM detects a decrease in idle speed and restarts the engine to secure reliability in handleability by transmitting a cranking request signal to IPDM E/R for activating the starter motor under the following conditions:

- Selector lever: P or any position other than N
- Idle switch: ON (Accelerator pedal not depressed)
- Stop lamp switch: ON (Brake pedal depressed)

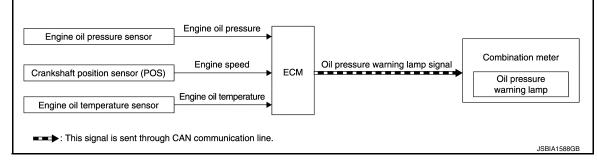
Models with no Intelligent Key System transmit a control signal directly to IPDM E/R. On the other hand, models with the Intelligent Key System transmit a control signal to IPDM E/R by way of BCM via CAN communication.

IPDM E/R detects an operating state of the starter motor relay and the starter motor control relay and transmits a feed back signal to ECM via CAN Communication.

ENGINE PROTECTION CONTROL AT LOW ENGINE OIL PRESSURE

ENGINE PROTECTION CONTROL AT LOW ENGINE OIL PRESSURE : System Description INFOID:000000012406299

SYSTEM DIAGRAM



SYSTEM DESCRIPTION

· The engine protection control at low engine oil pressure warns the driver of a decrease in engine oil pressure by the oil pressure warning lamp before the engine becomes damaged.

< SYSTEM DESCRIPTION >

- When detecting a decrease in engine oil pressure at an engine speed less than 1,000 rpm, ECM transmits an oil pressure warning lamp signal to the combination meter. The combination meter turns ON the oil pressure warning lamp, according to the signal.
- When detecting a decrease in engine oil pressure at an engine speed 1,000 rpm or more, ECM transmits an oil pressure warning lamp signal to the combination meter.

The combination meter turns ON the oil pressure warning lamp, according to the signals. When detecting a decrease in engine oil pressure, ECM cuts fuel if the engine speed exceeds the specified value.

Decrease in engine oil pressure	Engine speed	Combination meter	Fuel cut	С
Decrease in engine on pressu		Oil pressure warning lamp		
Detection	Less than 1,000 rpm	ON*	NO	D
Detection	1,000 rpm or more	ON	YES	D

*: When detecting a normal engine oil pressure, ECM turns OFF the oil pressure warning lamp.

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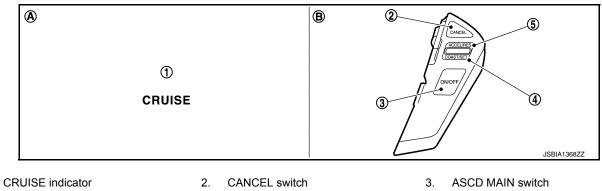
OPERATION

AUTOMATIC SPEED CONTROL DEVICE (ASCD)

AUTOMATIC SPEED CONTROL DEVICE (ASCD) : Switch Name and Function

INFOID:000000012406300

SWITCHES AND INDICATORS



4. SET / - switch (SET/COAST)

1.

- A. On the combination meter
- B. On the steering wheel

SET SPEED RANGE

ASCD system can be set the following vehicle speed.

Minimum speed (Approx.)	Maximum speed (Approx.)
40 km/h (25 MPH)	144 km/h (89 MPH)

SWITCH OPERATION

Item	Function
CANCEL switch	Cancels the cruise control driving.
RES / + switch (RESUME/ACCELERATE)	Resumes the set speed.Increases speed incrementally during cruise control driving.
SET / – switch (SET/COAST)	Sets desired cruise speed.Decreases speed incrementally during cruise control driving.
ASCD MAIN switch	Master switch to activate the ASCD system.

CANCEL CONDITION

• When any of following conditions exist, the cruise operation is canceled.

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RES / + switch

(RESUME/ACCELERATE)

- CANCEL switch is pressed
- ASCD MAIN switch pressed (Set speed is cleared)
- More than two switches at ASCD steering switch are pressed at the same time (Set speed is cleared)
- Brake pedal is depressed
- Selector lever position is changed to N, P or R
- Vehicle speed decreased to 13 km/h (8 MPH) lower than the set speed
- TCS system is operated
- When the ECM detects any of the following conditions, the ECM cancels the cruise operation and informs the driver by blinking CRUISE indicator lamp.
- Engine coolant temperature is slightly higher than the normal operating temperature. Then CRUISE indicator lamp is blinked slowly.

NOTE:

Engine coolant temperature decreases to the normal operating temperature, CRUISE indicator lamp stop blinking and the cruise operation is able to work.

· Malfunction for some self-diagnoses regarding ASCD system. SET indicator lamp is blinked quickly.

OPERATION

< SYSTEM DESCRIPTION >

[VQ35DE]

• When ASCD MAIN switch is turned to OFF during the cruise control driving, all of ASCD operations is canceled and vehicle speed memory is erased.

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ON BOARD DIAGNOSTIC (OBD) SYSTEM

< SYSTEM DESCRIPTION >

ON BOARD DIAGNOSTIC (OBD) SYSTEM

Diagnosis Description

This system is an on board diagnostic system that records exhaust emission-related diagnostic information and detects a sensors/actuator-related malfunction. A malfunction is indicated by the malfunction indicator lamp (MIL) and stored in ECU memory as a DTC. The diagnostic information can be obtained with the diagnostic tool (GST: Generic Scan Tool).

GST (Generic Scan Tool)

INFOID:000000012406302

When GST is connected with a data link connector equipped on the vehicle side, it will communicate with the control unit equipped in the vehicle and then enable various kinds of diagnostic tests. Refer to <u>EC-62</u>, "<u>Diagnosis Description</u>".

NOTE:

Service \$0A is not applied for regions where it is not mandated.

INFOID:000000012406301

[VQ35DE]

DIAGNOSIS SYSTEM (ECM) DIAGNOSIS DESCRIPTION

DIAGNOSIS DESCRIPTION : 1st Trip Detection Logic and Two Trip Detection Logic

EC INFOID:000000012406303

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

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

×: Applicable —: Not applicable

		Μ	IL		D	тс	1st trip DTC		E
Items	1s	t trip	2nd trip		1st trip	2nd trip	1st trip	2nd trip	
Konie	Blinking	Illuminat- ed	Blinking	Illuminat- ed	displaying	displaying	displaying	display- ing	F
Misfire (Possible three way catalyst damage) — DTC: P0300 – P0306 is being detected	×	_	_	_	_	_	×	_	G
Misfire (Possible three way catalyst damage) — DTC: P0300 – P0306 is being detected	_	_	×	_	_	×	_	_	Н
One trip detection diagnoses (Re- fer to <u>EC-103, "DTC Index"</u> .)	_	×	_	_	×	_	_		
Except above	_	—	—	×	—	×	×	_	

DIAGNOSIS DESCRIPTION : DTC and Freeze Frame Data

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

If a malfunction is detected during the 1st trip, the 1st trip DTC is saved in the ECM memory. The MIL will not 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 saved 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 M 1st trip, the DTC and 1st trip DTC are stored in the ECM memory.

For malfunctions in which 1st trip DTCs are displayed, refer to EC-103, "DTC Index". These items are required by legal regulations to continuously monitor the system/component. In addition, the items monitored Ν non-continuously are also displayed on CONSULT.

1st trip DTC is specified in Service \$07 of SAE J1979/ISO 15031-5. 1st trip DTC detection occurs without illuminating the MIL and therefore does not warn the driver of a malfunction.

When a 1st trip DTC is detected, check, print out or write down and erase (1st trip) DTC and Freeze Frame Ο data as specified in Work Flow procedure Step 2, refer to EC-136, "Work Flow". Then perform DTC Confirmation Procedure or Component Function Check to try to duplicate the malfunction. If the malfunction is duplicated, the item requires repair. Ρ

FREEZE FRAME DATA AND 1ST TRIP FREEZE FRAME DATA

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

Data which are stored in the ECM memory, along with the 1st trip DTC, are called 1st trip freeze frame data. The data, stored together with the DTC data, are called freeze frame data and displayed on CONSULT or GST. The 1st trip freeze frame data can only be displayed on the CONSULT screen.

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< SYSTEM DESCRIPTION >

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							
3	1st trip freeze frame d	1st trip freeze frame data							

For example, the EGR malfunction (Priority: 2) was detected and the freeze frame data was saved in the 2nd trip. After that when the misfire (Priority: 1) is detected in another trip, the freeze frame data will be updated from the EGR malfunction to the misfire. The 1st trip freeze frame data is updated each time a different malfunction is detected. There is no priority for 1st trip freeze frame data. However, once freeze frame data 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.

DIAGNOSIS DESCRIPTION : Counter System

INFOID:000000012406305

RELATIONSHIP BETWEEN MIL, 1ST TRIP DTC, DTC, AND DETECTABLE ITEMS

- When a malfunction is detected for the first time, the 1st trip DTC and the 1st trip freeze frame data are stored in the ECM memory.
- When the same malfunction is detected in two consecutive trips, the DTC and the freeze frame data are stored in the ECM memory, and the MIL will come on.
- The MIL will turn OFF after the vehicle is driven 3 times (driving pattern B) with no malfunction. 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 CON-SULT 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.

COUNTER SYSTEM CHART

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

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

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

• *1: Clear timing is at the moment OK is detected.

• *2: Clear timing is when the same malfunction is detected in the 2nd trip.

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

< SYSTEM DESCRIPTION >

А This driving pattern satisfies with B and C patterns. This driving pattern EC satisfies with C but not B. NG This driving pattern NG OK NG Detection satisfies with B but not C. Detection Detection Detection <Driving Pattern> Vehicle 1st speed Trip Trip Trip Trip D NG OK NG NG IGN ON Ε MIL MIL illuminates illuminates MIL turns off MIL turns off ۲Ż в Нc 0 Ω 0 Counter DTC & DISPLAY NO DISPLAY Freeze NO DISPL Data> Н Frame Data *4 °3 DISPLAY DISPLAY Frame 1st trip CLEAR CLEAR Freeze Frame Freeze 6 Data DISPLAY DISPLAY 1st trip CLEAR CLEAF trip) DTC (1st 1 6 *8 ∞ DTC 80 С 79 5 Counter Κ trip) <(1st L JMBIA1417GB Μ *1: When the same malfunction is de-*2: MIL will turn OFF after vehicle is driv- *3: When the same malfunction is deen 3 times (pattern B) without any tected in two consecutive trips, MIL tected in two consecutive trips, the will light up. malfunctions. DTC and the freeze frame data will be stored in ECM. Ν *4: The DTC and the freeze frame data *5: When a malfunction is detected for *6: The 1st trip DTC and the 1st trip freeze frame data will be cleared at will not be displayed any longer after the first time, the 1st trip DTC and the 1st trip freeze frame data will be the moment OK is detected. vehicle is driven 80 times (pattern C) stored in ECM. without the same malfunction. (The Ο DTC and the freeze frame data still remain in ECM.) *7: When the same malfunction is de-*8: 1st trip DTC will be cleared when ve-Ρ tected in the 2nd trip, the 1st trip hicle is driven once (pattern C) withfreeze frame data will be cleared. out the same malfunction after DTC is stored in ECM.

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

Driving Pattern B Refer to <u>EC-67, "DIAGNOSIS DESCRIPTION : Driving Pattern"</u>. [VQ35DE]

< SYSTEM DESCRIPTION >

Driving Pattern C Refer to <u>EC-67. "DIAGNOSIS DESCRIPTION : Driving Pattern"</u>. Example:

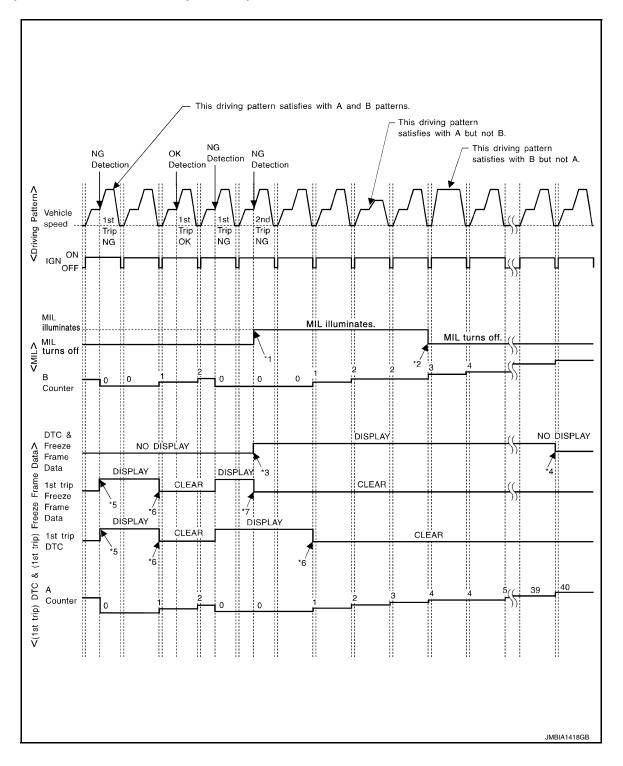
If the stored freeze frame data is as per the following:

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

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

Engine speed: 475 - 1,225 rpm, Calculated load value: 27 - 33%, Engine coolant temperature: more than $70^{\circ}C (158^{\circ}F)$

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



[VQ35DE]

*1: When the same malfunction is de- tected in two consecutive trips, MIL will light up. *2: MIL will turn OFF after vehicle is driv- en 3 times (pattern B) without any malfunctions. *3: When the same malfunction is de- tected in two consecutive trips, the DTC and the freeze frame data will be stored in ECM.	А
*4: The DTC and the freeze frame data *5: When a malfunction is detected for *6: 1st trip DTC will be cleared after vehi-	EC
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.)the first time, the 1st trip DTC and the 1st trip freeze frame data will be stored in ECM.cle is driven once (pattern B) without the same malfunction. the same malfunction.	С
*7: When the same malfunction is de- tected in the 2nd trip, the 1st trip freeze frame data will be cleared.	D
Explanation for Driving Patterns Except for "Misfire <exhaust deterioration="" quality="">", "Fuel Injection System"</exhaust>	Е
Driving Pattern A Refer to <u>EC-67, "DIAGNOSIS DESCRIPTION : Driving Pattern"</u> .	F
Driving Pattern B Refer to EC-67, "DIAGNOSIS DESCRIPTION : Driving Pattern".	
DIAGNOSIS DESCRIPTION : Driving Pattern	G
Always drive at a safe speed.	Н
DRIVING PATTERN A	
 Driving pattern A means a trip satisfying the following conditions. Engine speed reaches 400 rpm or more. Engine coolant temperature rises by 20°C (36°F) or more after starting the engine. 	
 Engine coolant temperature reaches 70°C (158°F) or more. The ignition switch is turned from ON to OFF. 	J
 NOTE: When the same malfunction is detected regardless of driving conditions, reset the counter of driving pattern 	0
A.When the above conditions are satisfied without detecting the same malfunction, reset the counter of driving	K
pattern A.	
DRIVING PATTERN B Driving pattern B means a trip satisfying the following conditions.	L
Engine speed reaches 400 rpm or more.	
 Engine coolant temperature reaches 70°C (158°F) or more. Vehicle speed of 70 – 120 km/h (44 – 75 MPH) is maintained for 60 seconds or more under the control of 	M
 closed loop. Vehicle speed of 30 – 60 km/h (19 – 37 MPH) is maintained for 10 seconds or more under the control of 	
closed loop.Under the closed loop control condition, the following state reaches 12 seconds or more in total: Vehicle	Ν
 speed of 4 km/h (2 MPH) or less with idling condition. The state of driving at 10 km/h (7 MPH) or more reaches 10 minutes or more in total. 	
 A lapse of 22 minutes or more after engine start. NOTE: 	0
Drive the vehicle at a constant velocity.	
 When the same malfunction is detected regardless of driving conditions, reset the counter of driving pattern B. 	Ρ
 When the above conditions are satisfied without detecting the same malfunction, reset the counter of driving pattern B. 	
DRIVING PATTERN C	

Driving pattern C means operating vehicle as per the following: The following conditions should be satisfied at the same time: Engine speed: (Engine speed in the freeze frame data) ± 375 rpm

EC-67

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

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

NOTE:

- When the same malfunction is detected regardless of the above vehicle conditions, reset the counter of driving pattern C.
- When the above conditions are satisfied without detecting the same malfunction, reset the counter of driving pattern C.
- The 1st trip DTC will be cleared when C counter is counted once without the same malfunction after DTC is stored in ECM.

DRIVING PATTERN D

Driving pattern D means a trip satisfying the following conditions.

- The state of driving at 40 km/h (25 MPH) reaches 300 seconds or more in total.
- Idle speed lasts 30 seconds or more.
- A lapse of 600 seconds or more after engine start.

NOTE:

- When the same malfunction is detected regardless of driving conditions, reset the counter of driving pattern D.
- When the above conditions are satisfied without detecting the same malfunction, reset the counter of driving pattern D.

DIAGNOSIS DESCRIPTION : System Readiness Test (SRT) Code

INFOID:000000012406307

System Readiness Test (SRT) code is specified in Service \$01 of SAE J1979/ISO 15031-5.

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 permanent DTC is stored or MIL illuminates 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"), DTC (No DTCs) and permanent DTC (NO permanent DTCs) before the inspection.

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.

< SYSTEM DESCRIPTION >

[VQ35DE]

			Example									
Self-diagno	osis result	Diagnosis	$\begin{array}{rcl} \mbox{Ignition cycle} \\ \leftarrow \mbox{ON} \rightarrow & \mbox{OFF} & \leftarrow \mbox{ON} \rightarrow & \mbox{OFF} & \leftarrow \mbox{ON} \rightarrow \end{array}$									
All OK	Case 1	P0400	OK (1)	— (1)	OK (2)	— (2)						
		P0402	OK (1)	— (1)	— (1)	OK (2)	_					
		P1402	OK (1)	OK (2)	— (2)	— (2)	_					
		SRT of EGR	"CMPLT"	"CMPLT"	"CMPLT"	"CMPLT"	-					
	Case 2	P0400	OK (1)	— (1)	— (1)	— (1)						
		P0402	— (0)	— (0)	OK (1)	— (1)	_					
		P1402	OK (1)	OK (2)	— (2)	— (2)						
		SRT of EGR	"INCMP"	"INCMP"	"CMPLT"	"CMPLT"	_					
NG exists	Case 3	P0400	OK	ОК	_	—	_					
		P0402	_	—	_		_					
		P1402	NG	_	NG	NG (Consecutive NG)	_					
		(1st trip) DTC	1st trip DTC	-	1st trip DTC	DTC (= MIL ON)	_					
		SRT of EGR	"INCMP"	"INCMP"	"INCMP"	"CMPLT"						

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

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

-: Self-diagnosis is not carried out.

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

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

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

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

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

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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".

DIAGNOSIS DESCRIPTION : Permanent Diagnostic Trouble Code (Permanent DTC)

INFOID:000000012406308

Permanent DTC is defined in SAE J1979/ISO 15031-5 Service \$0A.

ECM stores a DTC issuing a command of turning on MIL as a permanent DTC and keeps storing the DTC as a permanent DTC until ECM judges that there is no presence of malfunction.

Permanent DTCs cannot be erased by using the Erase function of CONSULT-III or Generic Scan Tool (GST) and by disconnecting the battery to shut off power to ECM. This prevents a vehicle from passing the state emission inspection without repairing a malfunctioning part.

When not passing the state emission inspection due to more than one permanent DTC, permanent DTCs should be erased, referring to this manual.

NOTE:

- The important items in state emission inspection are that MIL is not ON, SRT test items are set, and permanent DTCs are not included.
- Permanent DTCs do not apply for regions that permanent DTCs are not regulated by law.

< SYSTEM DESCRIPTION >

PERMANENT DTC SET TIMING

The setting timing of permanent DTC is stored in ECM with the lighting of MIL when a DTC is confirmed.

DIAGNOSIS DESCRIPTION : Malfunction Indicator Lamp (MIL)

When emission-related ECU detects a malfunction in the emission control systems components and/or the powertrain control components (which affect vehicle emissions), it turns on/blinks MIL to inform the driver that a malfunction has been detected.

 The MIL illuminates when ignition switch is turned ON (engine is not running).
 NOTE:

Check the MIL circuit if MIL does not illuminate. Refer to <u>EC-490, "Component Function Check"</u>.

2. When the engine is started, the MIL should go off. **NOTE:**

If MIL continues to illuminate/blink, perform self-diagnoses and inspect/repair accordingly because an emission-related ECU has detected a malfunction in the emission control systems components and/or the powertrain control components (which affect vehicle emissions).

On Board Diagnosis Function

ON BOARD DIAGNOSIS ITEM

The on board diagnostic system has the following functions.

Diagnostic test mode	Function
Bulb check	MIL can be checked.
SRT status	ECM can read if SRT codes are set.
Malfunction warning	If ECM detects a malfunction, it illuminates or blinks MIL to inform the driver that a malfunction has been detected.
Self-diagnostic results	DTCs or 1st trip DTCs stored in ECM can be read.
Accelerator pedal released po- sition learning	ECM can learn the accelerator pedal released position. Refer to EC-147. "Description".
Throttle valve closed position learning	ECM can learn the throttle valve closed position. Refer to EC-148. "Description".
Idle air volume learning	ECM can learn the idle air volume. Refer to EC-149. "Description".
Mixture ratio self-learning value clear	Mixture ratio self-learning value can be erased. Refer to <u>EC-151, "Description"</u> .

BULB CHECK MODE

Description

This function allows damage inspection in the MIL bulb (blown, open circuit, etc.).

Operation Procedure

- 1. Turn ignition switch ON.
- The MIL on the instrument panel should stay ON. If it remains OFF, check MIL circuit. Refer to <u>EC-490, "Diagnosis Procedure"</u>.

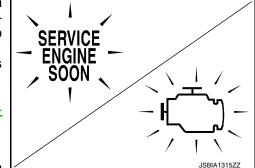
SRT STATUS MODE

Description

This function allows to read if ECM has completed the self-diagnoses of major emission control systems and components. For SRT, refer to <u>EC-68, "DIAGNOSIS DESCRIPTION : System Readiness Test (SRT) Code"</u>.

Operation Procedure

- 1. Turn ignition switch ON and wait 20 seconds.
- 2. SRT status is indicated as shown blow.
 - ECM continues to illuminate MIL if all SRT codes are set.



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< SYSTEM DESCRIPTION >

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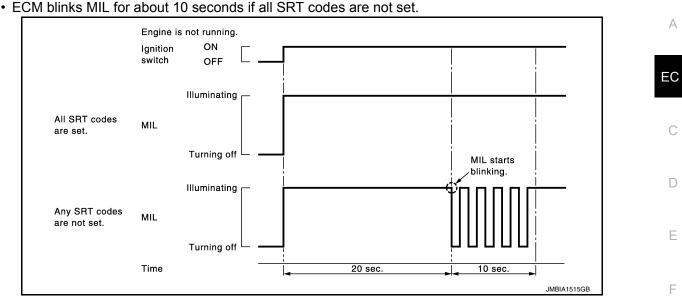
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MALFUNCTION WARNING MODE

Description

In this function ECM turns on or blinks MIL when it detects a malfunction in the emission control system components and/or the powertrain control components (which affect vehicle emissions) to inform the driver that a malfunction has been detected.

Operation Procedure

- 1. Turn ignition switch ON.
- 2. Check that MIL illuminates. If it remains OFF, check MIL circuit. Refer to <u>EC-490, "Diagnosis Procedure"</u>.
- 3. Start engine and let it idle.
 - For two trip detection logic diagnoses, ECM turns on MIL when it detects the same malfunction twice in the two consecutive driving cycles.
 - For 1st trip detection logic diagnoses, ECM turns on MIL when it detects a malfunction in one driving cycle.
 - ECM blinks MIL when it detects a malfunction that may damage the three way catalyst (misfire).

SELF-DIAGNOSTIC RESULTS MODE

Description

This function allows to indicate DTCs or 1st trip DTCs stored in ECM according to the number of times MIL is blinking.

How to Set Self-diagnostic Results 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 mal-function.
- After ignition switch is turned off, ECM is always released from the "self-diagnostic results" mode.
- 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.
 - Fully depress the accelerator pedal.
 - Fully release the accelerator pedal.
- 3. Wait 7 seconds, fully depress the accelerator pedal and keep it depressed for approx. 10 seconds until the MIL starts blinking.

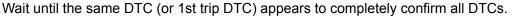
NOTE:

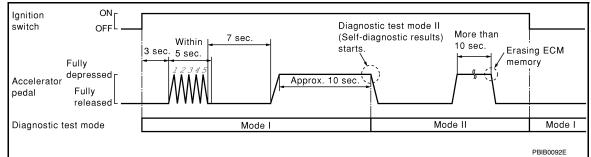
Do not release the accelerator pedal for 10 seconds if MIL starts blinking during this period. This blinking is displaying SRT status and is continued for another 10 seconds.

4. Fully release the accelerator pedal. ECM has entered to "Self-diagnostic results" mode.

< SYSTEM DESCRIPTION >

NOTE:

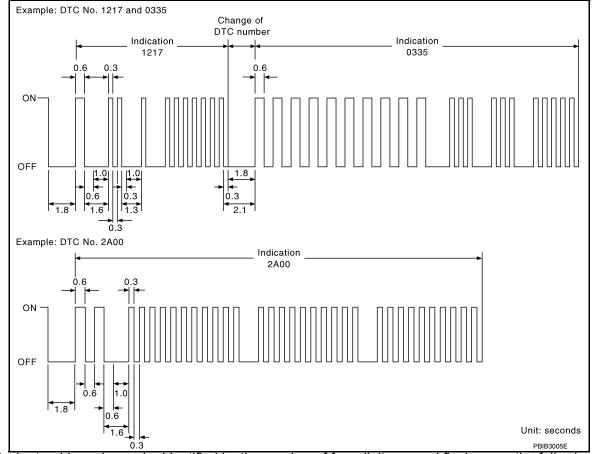




How to Read Self-diagnostic Results

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 "malfunction warning" mode, 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 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 per the following.

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

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

The 100th-digit numeral and lower digit numerals consist of a 0.3-seconds ON and 0.3-seconds OFF cycle. A change from one digit numeral to another occurs at an interval of 1.0-second OFF. In other words, the later numeral appears on the display 1.3 seconds after the former numeral has disappeared. A change from one trouble code to another occurs at an interval of 1.8-seconds OFF.

< SYSTEM DESCRIPTION >

In this way, all the detected malfunctions are classified by their DTC numbers. The DTC 0000 refers to no malfunction. Refer to <u>EC-103</u>, "<u>DTC Index</u>".

How to Erase Self-diagnostic Results

By performing this procedure, ECM memory is erased and the following diagnostic information is erased as	
well.	E
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- Diagnostic trouble codes
- 1st trip diagnostic trouble codes
- Freeze frame data
- 1st trip freeze frame data
- System readiness test (SRT) codes

Test values

NOTE:

Also, if a battery terminal is disconnected, ECM memory is erased and the diagnostic information as listed above is erased. (The amount of time required for erasing may vary from a few seconds to several hours.)

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.
- 4. Turn ignition switch ON.
- 5. Set ECM in "self-diagnostic results" mode.
- 6. The diagnostic information has been erased from the backup memory in the ECM. Fully depress the accelerator pedal and keep it depressed for more than 10 seconds.
- 7. Fully release the accelerator pedal, and confirm the DTC 0000 is displayed.

CONSULT Function

FUNCTION

Diagnostic test mode	Function
Self Diagnostic Result	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.
Work support	This mode enables a technician to adjust some devices faster and more accurately by following the in- dications on the CONSULT unit.
Active Test	Diagnostic Test Mode in which CONSULT drives some actuators apart from the ECMs and also shifts some parameters in a specified range.
ECU Identification	ECM part number can be read.
DTC Work Support	The status of system monitoring tests and the self-diagnosis status/results can be confirmed.

*: The following emission-related diagnostic information is cleared when the ECM memory is erased.

- · Diagnostic trouble codes
- 1st trip diagnostic trouble codes
- Freeze frame data
- 1st trip freeze frame data
- System readiness test (SRT) codes
- Test values

SELF DIAGNOSTIC RESULT MODE

Self Diagnostic Item Regarding items of DTC and 1st trip DTC, refer to <u>EC-103, "DTC_Index"</u>.

How to Read DTC and 1st Trip DTC

DTCs and 1st trip DTCs related to the malfunction are displayed in "self-diag results".

- When ECM detects a 1st trip DTC, 1t" is displayed for "TIME".
- When ECM has detected a current DTC, "0" is displayed for "TIME".
- If "TIME" is neither "0" nor "1t", the DTC occurred in the past and ECM shows the number of times the vehicle has been driven since the last detection of the DTC.

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< SYSTEM DESCRIPTION >

NOTE:

- If the ignition switch stays ON after repair work, be sure to turn ignition switch OFF once. Wait at least 10 seconds and then turn it ON (engine stopped) again.
- If the DTC is not for A/T related items (see <u>EC-103. "DTC Index"</u>), skip step 1.
- 1. Select "ENGINE" with CONSULT.
- 2. Select "SELF-DIAG RESULTS".
- 3. Touch "ERASE". (DTC in ECM will be erased.)

Freeze Frame Data and 1st Trip Freeze Frame Data

Freeze frame data item*	Description
DIAG TROUBLE CODE [PXXXX]	 The engine control component part/control system has a trouble code that is displayed as PXXXX. (Refer to <u>EC-103</u>, "<u>DTC Index</u>".)
FUEL SYS-B1	"Fuel injection system status" at the moment a malfunction is detected is displayed.
FUEL SYS-B2	 One of the following mode is displayed. Mode2: Open loop due to detected system malfunction Mode3: Open loop due to driving conditions (power enrichment, deceleration enleanment) Mode4: Closed loop - using oxygen sensor(s) as feedback for fuel control Mode5: Open loop - has not yet satisfied condition to go to closed loop
CAL/LD VALUE [%]	The calculated load value at the moment a malfunction is detected is displayed.
COOLANT TEMP [°C] or [°F]	The engine coolant temperature at the moment a malfunction is detected is displayed.
L-FUEL TRM-B1 [%]	"Long-term fuel trim" at the moment a malfunction is detected is displayed.
L-FUEL TRM-B2 [%]	The long-term fuel trim indicates much more gradual feedback compensation to the base fuel schedule than short-term fuel trim.
S-FUEL TRM-B1 [%]	"Short-term fuel trim" at the moment a malfunction is detected is displayed.
S-FUEL TRM-B2 [%]	 The short-term fuel trim indicates dynamic or instantaneous feedback compensation to the base fuel 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.
ABSOL TH·P/S [%]	The throttle valve opening angle at the moment a malfunction is detected is displayed.
B/FUEL SCHDL [msec]	The base fuel schedule at the moment a malfunction is detected is displayed.
INT/A TEMP SE [°C] or [°F]	The intake air temperature at the moment a malfunction is detected is displayed.
INT MANI PRES [kPa]	These items are displayed but are not applicable to this model.
COMBUST CONDITION	

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

DATA MONITOR MODE

NOTE:

The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

Monitored Item

For reference values of the following items, refer to EC-83. "Reference Value".

Monitored item	Unit	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.
MASS AIR FLOW SENSOR (Hz)	Hz	• The signal frequency of the mass air flow sensor is displayed.	

< SYSTEM DESCRIPTION >

Monitored item	Unit	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. 	When engine is running, specification range is indicated in "SPEC".
A/F ALPHA-B1 A/F ALPHA-B2	%	 The mean value of the air-fuel ratio feedback cor- rection factor per cycle is indicated. 	 When the engine is stopped, a certain value is indicated. This data also includes the data for the air-fuel ratio learning control. When engine is running, specification range is indicated in "SPEC".
COOLAN TEMP/S	°C or °F	 The engine coolant temperature (determined by the signal voltage of the engine coolant tempera- ture sensor) is displayed. 	• When the engine coolant temperature sensor is open or short-circuited, ECM enters fail-safe mode. The en- gine coolant temperature determined by the ECM is displayed.
A/F SEN1 (B1)	V	The A/F signal computed from the input signal of	
A/F SEN1 (B2)	v	the air fuel ratio (A/F) sensor 1 is displayed.	
HO2S2 (B1)	V	• The signal voltage of the heated oxygen sensor 2	
HO2S2 (B2)	v	is displayed.	
HO2S2 MNTR(B1) HO2S2 MNTR(B2)	RICH/LEAN	 Display of heated oxygen sensor 2 signal: RICH: means the amount of oxygen after three way catalyst is relatively small. LEAN: means the amount of oxygen after three way catalyst is relatively large. 	When the engine is stopped, a certain value is indicated.
VHCL SPEED SE	km/h or mph	 The vehicle speed computed from the vehicle speed signal sent from combination meter is dis- played. 	
BATTERY VOLT	V	The power supply voltage of ECM is displayed.	
ACCEL SEN 1		The accelerator pedal position sensor signal volt-	ACCEL SEN 2 signal is converted by
ACCEL SEN 2	V	age is displayed.	ECM internally. Thus, it differs from ECM terminal voltage signal.
TP SEN 1-B1		The throttle position sensor signal voltage is dis-	TP SEN 2-B1 signal is converted by
TP SEN 2-B1	V	played.	ECM internally. Thus, it differs from ECM terminal voltage signal.
FUEL T/TMP SE	°C or °F	 The fuel temperature (determined by the signal voltage of the fuel tank temperature sensor) is displayed. 	
INT/A TEMP SE	°C or °F	 The intake air temperature (determined by the signal voltage of the intake air temperature sen- sor) is indicated. 	
EVAP SYS PRES	V	The signal voltage of EVAP control system pres- sure sensor is displayed.	
FUEL LEVEL SE	V	• The signal voltage of the fuel level sensor is displayed.	
START SIGNAL	ON/OFF	 Indicates start signal status [ON/OFF] computed by the ECM according to the signals of engine speed and battery voltage. 	 After starting the engine, [OFF] is dis- played regardless of the starter sig- nal.
CLSD THL POS	ON/OFF	 Indicates idle position [ON/OFF] computed by ECM according to the accelerator pedal position sensor signal. 	
AIR COND SIG	ON/OFF	• Indicates [ON/OFF] condition of the air condition- er switch as determined by the air conditioner sig- nal.	
P/N POSI SW	ON/OFF	 Indicates [ON/OFF] condition from the park/neu- tral position (PNP) signal. 	

< SYSTEM DESCRIPTION >

Monitored item	Unit	Description	Remarks
PW/ST SIGNAL	ON/OFF	• [ON/OFF] condition of the power steering system (determined by the signal voltage of the power steering pressure sensor) 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 light- ing switch are OFF. 	
IGNITION SW	ON/OFF	Indicates [ON/OFF] condition from ignition switch signal.	
HEATER FAN SW	ON/OFF	 Indicates [ON/OFF] condition from the heater fan switch signal. 	
BRAKE SW	ON/OFF	 Indicates [ON/OFF] condition from the stop lamp switch signal. 	
INJ PULSE-B1 INJ PULSE-B2	msec	 Indicates the actual fuel injection pulse width compensated by ECM according to the input sig- nals. 	• When the engine is stopped, a certain computed value is indicated.
IGN TIMING	BTDC	 Indicates the ignition timing computed by ECM according to the input signals. 	• When the engine is stopped, a certain value is indicated.
CAL/LD VALUE	%	"Calculated load value" indicates the value of the current air flow divided by peak air flow.	
MASS AIRFLOW	g/s	 Indicates the mass air flow computed by ECM ac- cording to the signal voltage of the mass air flow sensor. 	
PURG VOL C/V	%	 Indicates the EVAP canister purge volume control solenoid valve control value computed by the ECM according to the input signals. The opening becomes larger as the value increases. 	
INT/V TIM (B1) INT/V TIM (B2)	°CA	 Indicates [°CA] of intake camshaft advance an- gle. 	
INT/V SOL-B1		The control value of the intake valve timing con-	
INT/V SOL-B2	%	trol solenoid valve (determined by ECM according to the input signals) is indicated.The advance angle becomes larger as the value increases.	
VIAS S/V-1	ON/OFF	 The control condition of the VIAS control solenoid valve 1 (determined by ECM according to the in- put signals) is indicated. ON: VIAS control solenoid valve 1 is operating. OFF: VIAS control solenoid valve 1 is not operat- ing. 	
VIAS S/V-2	ON/OFF	 The control condition of the VIAS control solenoid valve 2 (determined by ECM according to the in- put signals) is indicated. ON: VIAS control solenoid valve 2 is operating. OFF: VIAS control solenoid valve 2 is not operat- ing. 	
AIR COND RLY	ON/OFF	• The air conditioner relay control condition (deter- mined by ECM according to the input signals) is indicated.	
ENGINE MOUNT	IDLE/TRVL	 The control condition of the electronic controlled engine mount (determined by ECM according to the input signals) is indicated. IDLE: Engine speed is below 950 rpm TRVL: Engine speed is above 950 rpm 	

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Monitored item	Unit	Description	Remarks	Δ
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 		EC
THRTL RELAY	ON/OFF	 Indicates the throttle control motor relay control condition determined by the ECM according to the input signals. 		С
COOLING FAN	HI/MID/LOW/ OFF	 The control condition of the cooling fan (determined by ECM according to the input signals) is indicated. HI: High speed operation MID: Middle speed operation LOW: Low speed operation OFF: Stop 		D
HO2S2 HTR (B1)	01/055	Indicates [ON/OFF] condition of heated oxygen		
HO2S2 HTR (B2)	ON/OFF	sensor 2 heater determined by ECM according to the input signals.		F
I/P PULLY SPD	rpm	 Indicates the engine speed computed from the in- put speed sensor signal. 		
VEHICLE SPEED	km/h or mph	 The vehicle speed computed from the vehicle speed signal sent from TCM is displayed. 		G
IDL A/V LEARN	YET/CMPLT	 Displays 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. 		H
ENG OIL TEMP	°C or °F	• The engine oil temperature (determined by the signal voltage of the engine oil temperature sensor) is displayed.		I
TRVL AFTER MIL	km or mile	Distance traveled while MIL is activated.		J
A/F S1 HTR(B1) A/F S1 HTR(B2)	%	 Air fuel ratio (A/F) sensor 1 heater control value computed by ECM according to the input signals. The current flow to the heater becomes larger as the value increases. 		K
AC PRESS SEN	V	 The signal voltage from the refrigerant pressure sensor is displayed. 		L
VHCL SPEED SE	km/h or mph	• The vehicle speed computed from the vehicle speed signal sent from combination meter is displayed.		М
SET VHCL SPD	km/h or mph	The preset vehicle speed is displayed.		1 V I
MAIN SW	ON/OFF	 Indicates [ON/OFF] condition from MAIN switch signal. 		Ν
CANCEL SW	ON/OFF	 Indicates [ON/OFF] condition from CANCEL switch signal. 		
RESUME/ACC SW	ON/OFF	Indicates [ON/OFF] condition from RESUME/AC- CELERATE switch signal.		0
SET SW	ON/OFF	 Indicates [ON/OFF] condition from SET/COAST switch signal. 		Ρ
BRAKE SW1	ON/OFF	 Indicates [ON/OFF] condition from brake pedal position switch signal or ASCD clutch switch. 		
BRAKE SW2	ON/OFF	 Indicates [ON/OFF] condition of stop lamp switch signal. 		

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Monitored item	Unit	Description	Remarks
VHCL SPD CUT	NON/CUT	 Indicates the vehicle cruise condition. NON: Vehicle speed is maintained at the ASCD set speed. CUT: Vehicle speed decreased to excessively low compared with the ASCD set speed, and ASCD operation is cut off. 	
LO SPEED CUT	NON/CUT	 Indicates the vehicle cruise condition. NON: Vehicle speed is maintained at the ASCD set speed. CUT: Vehicle speed decreased to excessively low, and ASCD operation is cut off. 	
AT OD MONITOR	ON/OFF	 Indicates [ON/OFF] condition of CVT O/D ac- cording to the input signal from the TCM. 	
AT OD CANCEL	ON/OFF	Indicates [ON/OFF] condition of CVT O/D cancel request signal.	
CRUISE LAMP	ON/OFF	 Indicates [ON/OFF] condition of CRUISE lamp determined by the ECM according to the input signals. 	
SET LAMP	ON/OFF	 Indicates [ON/OFF] condition of SET lamp deter- mined by the ECM according to the input signals. 	
BAT CUR SEN	mV	 The signal voltage of battery current sensor is displayed. 	
ALT DUTY SIG	ON/OFF	 The control condition of the power generation voltage variable control (determined by ECM ac- cording to the input signals) is indicated. ON: Power generation voltage variable control is active. OFF: Power generation voltage variable control is inactive. 	
A/F ADJ-B1 A/F ADJ-B2		 Indicates the correction of a factor stored in ECM. The factor is calculated from the difference be- tween the target air-fuel ratio stored in ECM and the air-fuel ratio calculated from A/F sensor 1 sig- nal. 	
ALT DUTY	%	 Indicates the duty ratio of the power generation command value. The ratio is calculated by ECM based on the battery current sensor signal. 	
EVAP LEAK DIAG	YET/CMPLT	 Indicates the condition of EVAP leak diagnosis. YET: EVAP leak diagnosis has not been performed yet. CMPLT: EVAP leak diagnosis has been performed successfully. 	
EVAP DIAG READY	ON/OFF	 Indicates the ready condition of EVAP leak diagnosis. ON: Diagnosis has been ready condition. OFF: Diagnosis has not been ready condition. 	
HO2 S2 DIAG1 (B1)	INCMP/CM- PLT	 Indicates DTC P0139 self-diagnosis (delayed re- sponce) condition. INCMP: Self-diagnosis is incomplete. CMPLT: Self-diagnosis is complete. 	
HO2 S2 DIAG1 (B2)	INCMP/CM- PLT	 Indicates DTC P0139 self-diagnosis (delayed re- sponce) condition. INCMP: Self-diagnosis is incomplete. CMPLT: Self-diagnosis is complete. 	
HO2 S2 DIAG2 (B1)	INCMP/CM- PLT	 Indicates DTC P0139 self-diagnosis (slow re- sponce) condition. INCMP: Self-diagnosis is incomplete. CMPLT: Self-diagnosis is complete. 	

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Monitored item	Unit	Description	Remarks	
HO2 S2 DIAG2 (B2)	INCMP/CM- PLT	 Indicates DTC P0139 self-diagnosis (slow re- sponce) condition. INCMP: Self-diagnosis is incomplete. CMPLT: Self-diagnosis is complete. 		A EC
THRTL STK CNT B1*	—	—		
FUEL PUMP DUTY	%	 The control condition of the fuel pump control module (FPCM) (determined by ECM according- to the input signals) is indicated. 		С
BAT TEMP SEN	V	The signal voltage from the battery temperature sensor is displayed.		D
EOP SENSOR	mV	The signal voltage of EOP sensor is displayed.		
VTC DTY EX B1*	%	—		
VTC DTY EX B2*	%	—		E
A/F-S ATMSPHRC CRCT B1	_	Displays a determined value of atmospheric correc- tion factor necessary for correcting an A/F sensor signal input to ECM. The signal used for the correc- tion is an A/F sensor signal transmitted while driving under atmospheric pressure.		F
A/F-S ATMSPHRC CRCT B2	_	Displays a determined value of atmospheric correc- tion factor necessary for correcting an A/F sensor signal input to ECM. The signal used for the correc- tion is an A/F sensor signal transmitted while driving under atmospheric pressure.		G
A/F-S ATMSPHRC CRCT UP B1	count	Displays the number of updates of the A/F sensor atmospheric correction factor.		
A/F-S ATMSPHRC CRCT UP B2	count	Displays the number of updates of the A/F sensor atmospheric correction factor.		Ι
SYSTEM 1 DIAGNO- SIS A B2	INCMP/CM- PLT	 Indicates DTC P219B self-diagnosis condition. INCMP: Self-diagnosis is incomplete. CMPLT: Self-diagnosis is complete. 		J
SYSTEM 1 DIAGNO- SIS A B1	INCMP/CM- PLT	 Indicates DTC P219A self-diagnosis condition. INCMP: Self-diagnosis is incomplete. CMPLT: Self-diagnosis is complete. 		K
SYSTEM 1 DIAGNO- SIS B B2	ABSNT/ PRSNT	 Indicates DTC P219B self-diagnosis condition. ABSNT: Self-diagnosis standby PRSNT: Under self-diagnosis 		L
SYSTEM 1 DIAGNO- SIS B B1	ABSNT/ PRSNT	 Indicates DTC P219A self-diagnosis condition. ABSNT: Self-diagnosis standby PRSNT: Under self-diagnosis 		M

*: The item is indicated, but not used.

NOTE:

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

WORK SUPPORT MODE

Work Item

WORK ITEM	CONDITION	USAGE
FUEL PRESSURE RELEASE	 Fuel pump will stop by touching "START" during idling. crank a few times after engine stalls. 	When releasing fuel pressure from fuel line
IDLE AIR VOL LEARN	• The idle air volume that keeps the engine within the spec- ified 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 coefficient.	When clearing mixture ratio self- learning value

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WORK ITEM	CONDITION	USAGE
EVAP SYSTEM CLOSE	 Close the EVAP canister vent control valve in order to make EVAP system close under the following conditions. Ignition switch ON Engine not running Ambient temperature is above 0°C (32°F). No vacuum and no high pressure in EVAP system Fuel tank temperature is more than 0°C (32°F). Within 10 minutes after starting "EVAP SYSTEM CLOSE" When trying to execute "EVAP SYSTEM CLOSE" under the condition except above, CONSULT will discontinue it and display appropriate instruction. NOTE: When starting engine, CONSULT may display "BATTERY VOLTAGE IS LOW. CHARGE BATTERY", even in using charged battery. 	When detecting EVAP vapor leak- age in the EVAP system
VIN REGISTRATION	 In this mode, VIN is registered in ECM 	When registering VIN in ECM
TARGET IDLE RPM ADJ*	Idle condition	When setting target idle speed
TARGET IGN TIM ADJ*	Idle condition	When adjusting target ignition tim- ing
CLSD THL POS LEARN	HL POS LEARN • Ignition on and engine stopped.	
SAVING DATA FOR REPLC CPU	In this mode, save data that is in ECM.	When ECM is replaced.
WRITING DATA FOR REPLC CPU	In this mode, write data stored by "SAVE DATA FOR CPU REPLC" in work support mode to ECM.	When ECM is replaced.

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

ACTIVE TEST MODE

Test Item

TEST ITEM	CONDITION	JUDGMENT	CHECK ITEM (REMEDY)
FUEL INJEC- TION	 Engine: Return to the original non-standard condition Change the amount of fuel injec- tion using CONSULT. 	If malfunctioning symptom disappears, see CHECK ITEM.	 Harness and connectors Fuel injector Air fuel ratio (A/F) sensor 1
IGNITION TIM- ING	 Engine: Return to the original non-standard condition Timing light: Set Retard the ignition timing using CONSULT. 	If malfunctioning symptom disap- pears, see CHECK ITEM.	Perform Idle Air Volume Learning.
POWER BAL- ANCE	 Engine: After warming up, idle the engine. A/C switch OFF Selector lever: P or N position Cut off each injector signal one at a time using CONSULT. 	Engine runs rough or stops.	 Harness and connectors Compression Fuel injector Power transistor Spark plug Ignition coil
COOLING FAN*	 Ignition switch: ON Turn the cooling fan "HI", "MID", "LOW" and "OFF" using CON- SULT. 	Cooling fan moves and stops.	 Harness and connectors Cooling fan motor IPDM E/R
ENG COOLANT TEMP	 Engine: Return to the original non-standard condition Change the engine coolant tem- perature using CONSULT. 	If malfunctioning symptom disap- pears, see CHECK ITEM.	 Harness and connectors Engine coolant temperature sensor Fuel injector
FUEL PUMP RE- LAY	 Ignition switch: ON (Engine stopped) Turn the fuel pump relay "ON" and "OFF" using CONSULT and listen to operating sound. 	Fuel pump relay makes the operat- ing sound.	Harness and connectorsFuel pump relay

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TEST ITEM	CONDITION	JUDGMENT	CHECK ITEM (REMEDY)	
VIAS S/V-1	 Ignition switch: ON Turn solenoid valve "ON" and "OFF" using CONSULT and listen to operating sound. 	Solenoid valve makes the operating sound.	Harness and connectorsSolenoid valve	E
VIAS S/V-2	 Ignition switch: ON Turn solenoid valve "ON" and "OFF" using CONSULT and listen to operating sound. 	Solenoid valve makes the operating sound.	Harness and connectorsSolenoid valve	(
ENGINE MOUNTING	 Ignition switch: ON Turn electronic controlled engine mount "IDLE" and "TRVL" with CONSULT. 	Electronic controlled engine mount makes the operating sound.	Harness and connectorsElectronic controlled engine mount	[
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 CON-SULT. 	Engine speed changes according to the opening percent.	Harness and connectorsSolenoid valve	ŀ
FUEL/T TEMP SEN	Change the fuel tank temperature	using CONSULT.	·	
VENT CON- TROL/V	 Ignition switch: ON (Engine stopped) Turn solenoid valve "ON" and "OFF" with the CONSULT and listen to operating sound. 	Solenoid valve makes an operating sound.	Harness and connectorsSolenoid valve	(
INT V/T ASSIGN ANGLE	 Engine: Return to the original non-standard condition Change intake valve timing using CONSULT. 	If malfunctioning symptom disap- pears, see CHECK ITEM.	 Harness and connectors Intake valve timing control solenoid valve 	
EXH V/T ASSIGN ANGLE	 Engine: Return to the original non-standard condition Change exhaust valve timing us- ing CONSULT. 	If malfunctioning symptom disap- pears, see CHECK ITEM.	 Harness and connectors Exhaust valve timing control sole- noid valve 	

DTC WORK SUPPORT MODE

Test Item

Test mode	Test item	Corresponding DTC No.	Reference page	
	EVP V/S LEAK P0456/P1456*	P0456	<u>EC-341</u>	M
EVAPORATIVE SYSTEM	PURG VOL CN/V P1444	P0443	<u>EC-315</u>	111
	PURG FLOW P0441	P0441	<u>EC-310</u>	
	A/F SEN1(B1) P1278/P1279	—	_	Ν
A/F SEN1	A/F SEN1(B1) P1276	P0130	<u>EC-229</u>	
A/F SENT	A/F SEN1(B2) P1288/P1289	—	_	0
	A/F SEN1(B2) P1286	P0150	<u>EC-229</u>	0
	HO2S2(B1) P1146	P0138	<u>EC-245</u>	
	HO2S2(B1) P1147	P0137	<u>EC-239</u>	Р
HO2S2	HO2S2(B1) P0139	P0139	<u>EC-252</u>	
HU232	HO2S2(B2) P1166	P0158	<u>EC-245</u>	
	HO2S2(B2) P1167	P0157	<u>EC-239</u>	
	HO2S2(B2) P0159	P0159	<u>EC-252</u>	

*: DTC P1442 and P1456 does not apply to this model but appears in DTC Work Support Mode screens.

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SRT & P-DTC MODE

SRT STATUS Mode

- For items whose SRT codes are set, "CMPLT" is displayed on the CONSULT screen; for items whose SRT codes are not set, "INCMP" is displayed.
- "SRT STATUS" provides the presence or absence of permanent DTCs stored in ECM memory.

PERMANENT DTC STATUS Mode

How to display permanent DTC status

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.
- 4. Turn ignition switch ON.
- 5. Select "PERMANENT DTC STATUS" in "DTC & SRT CONFIRMATION" mode with CONSULT. **NOTE:**

Permanent DTCs stored in ECM memory are displayed on the CONSULT screen to show if a driving pattern required for erasing permanent DTCs is complete (CMPLT) or incomplete (INCMP). CAUTION:

Since the "PERMANENT DTC STATUS" screen displays the previous trip information, repeat the following twice to update the information: "Ignition switch OFF", "Wait for more than 10 seconds" and "Ignition switch ON".

CAUTION: Turn ignition switch from ON to OFF twice to update the information on the status screen.				
PERMANENT DTC	DRIVING PATTERN B	DRIVING PATTERN D		
XXXX INCMP INCMP				
хххх	CMPLT	INCMP		
хххх	INCMP	CMPLT		
хххх	CMPLT	INCMP		
хххх	INCMP	INCMP		
хххх	INCMP	INCMP		

NOTE:

This mode is not used in regions that permanent DTCs are not regulated by law.

SRT WORK SUPPORT Mode

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

PERMANENT DTC WORK SUPPORT Mode

This mode enables a technician to drive a vehicle to complete the driving pattern that is required for erasing permanent DTC.

NOTE:

This mode is not used in regions that permanent DTCs are not regulated by law.

JSBIA0062GB

ECU DIAGNOSIS INFORMATION ECM

Reference Value

VALUES ON THE DIAGNOSIS TOOL

NOTE:

- The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.
- Numerical values in the following table are reference values.
- These values are input/output values that ECM receives/transmits and may differ from actual operations. Example: The ignition timing shown by the timing light may differ from the ignition timing displayed on the data monitor. This occurs because the timing light shows a value calculated by ECM according to signals received from the cam shaft position sensor and other sensors related to ignition timing. E For outlines of following items, refer to EC-73, "CONSULT Function".

Monitor Item	C	Values/Status	
ENG SPEED	Run engine and compare CONSULT	Almost the same speed as the tachometer indication.	
MASS AIR FLOW SENSOR (Hz)	See EC-167, "Description".		·
B/FUEL SCHDL	See EC-167, "Description".		
A/F ALPHA-B1	See EC-167, "Description".		
A/F ALPHA-B2	See EC-167, "Description".		
COOLANT TEMP/S	Engine: After warming up		More than 70°C (158°F)
A/F SEN1 (B1)	Engine: After warming up	Maintaining engine speed at 2,000 rpm	Fluctuates around 2.2 V
A/F SEN1 (B2)	Engine: After warming up	Maintaining engine speed at 2,000 rpm	Fluctuates around 2.2 V
HO2S2 (B1)	 Revving engine from idle to 3,000 are met. Engine: After warming up After keeping engine speed betwe idle for 1 minute under no load 	0 - 0.3 V ←→ Approx. 0.6 - 1.0 V	
HO2S2 (B2)	 Revving engine from idle to 3,000 are met. Engine: After warming up After keeping engine speed betwe idle for 1 minute under no load 	0 - 0.3 V ←→ Approx. 0.6 - 1.0 V	
HO2S2 MNTR (B1)	 Revving engine from idle to 3,000 are met. Engine: After warming up After keeping engine speed betwe idle for 1 minute under no load 	LEAN $\leftarrow \rightarrow$ RICH	
HO2S2 MNTR (B2)	 Revving engine from idle to 3,000 are met. Engine: After warming up After keeping engine speed betwe idle for 1 minute under no load 	LEAN $\leftarrow \rightarrow$ RICH	
VHCL SPEED SE	Turn drive wheels and compare C cation.	ONSULT value with the speedometer indi-	Almost the same speed as speedometer indication
BATTERY VOLT	Ignition switch: ON (Engine stopp	ed)	11 - 14 V
	Ignition switch: ON	Accelerator pedal: Fully released	0.5 - 1.0 V
ACCEL SEN 1	(Engine stopped)	Accelerator pedal: Fully depressed	4.2 - 4.8 V
	Ignition switch: ON	Accelerator pedal: Fully released	0.5 - 1.0 V
ACCEL SEN 2* ¹	(Engine stopped)	Accelerator pedal: Fully depressed	4.2 - 4.8 V

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[VQ35DE]

INFOID:000000012406312

< ECU DIAGNOSIS INFORMATION >

Monitor Item	C	ondition	Values/Status
	Ignition switch: ON	Accelerator pedal: Fully released	More than 0.36 V
TP SEN 1-B1	(Engine stopped)Selector lever: D position	Accelerator pedal: Fully depressed	Less than 4.75 V
	Ignition switch: ON	Accelerator pedal: Fully released	More than 0.36 V
TP SEN 2-B1* ¹	(Engine stopped)Selector lever: D position	Accelerator pedal: Fully depressed	Less than 4.75 V
FUEL T/TMP SE	Ignition switch: ON		Indicates fuel tank tempera- ture
INT/A TEMP SE	Ignition switch: ON		Indicates intake air tempera- ture
EVAP SYS PRES	Ignition switch: ON		Approx. 1.8 - 4.8 V
FUEL LEVEL SE	Ignition switch: ON		Depending on fuel level of fuel tank
START SIGNAL	• Ignition switch: $ON \rightarrow START \rightarrow O$	DN	$OFF \rightarrow ON \rightarrow OFF$
	Ignition switch: ON	Accelerator pedal: Fully released	ON
CLSD THL POS	(Engine stopped)	Accelerator pedal: Slightly depressed	OFF
		Air conditioner switch: OFF	OFF
AIR COND SIG	Engine: After warming up, idle the engine	Air conditioner switch: ON (Compressor operates.)	ON
		Selector lever: P or N position	ON
P/N POSI SW	Ignition switch: ON	Selector lever: Except above position	OFF
	Engine: After warming up, idle the engine	Steering wheel: Not being turned	OFF
PW/ST SIGNAL		Steering wheel: Being turned	ON
LOAD SIGNAL	Ignition switch: ON	Rear window defogger switch: ON and/or Lighting switch: 2nd position	ON
		Rear window defogger switch and lighting switch: OFF	OFF
IGNITION SW	• Ignition switch: $ON \rightarrow OFF \rightarrow ON$		$ON \rightarrow OFF \rightarrow ON$
	Engine: After warming up, idle the	Heater fan switch: ON	ON
HEATER FAN SW	engine	Heater fan switch: OFF	OFF
	· Ignition owitch: ON	Brake pedal: Fully released	OFF
BRAKE SW	Ignition switch: ON	Brake pedal: Slightly depressed	ON
	Engine: After warming up	Idle	2.0 - 3.0 msec
INJ PULSE-B1	 Selector lever: P or N position Air conditioner switch: OFF No load 	2,000 rpm	1.9 - 2.9 msec
	Engine: After warming up	Idle	2.0 - 3.0 msec
INJ PULSE-B2	 Selector lever: P or N position Air conditioner switch: OFF No load 	2,000 rpm	1.9 - 2.9 msec
	Engine: After warming up	Idle	7 - 17°BTDC
IGN TIMING	 Selector lever: P or N position Air conditioner switch: OFF No load 	2,000 rpm	25 - 45°BTDC
	Engine: After warming up	Idle	5 - 35%
CAL/LD VALUE	 Selector lever: P or N position Air conditioner switch: OFF No load 	2,500 rpm	5 - 35%
	Engine: After warming up	Idle	2.0 - 6.0 g/s
MASS AIRFLOW	 Selector lever: P or N position Air conditioner switch: OFF No load 	2,500 rpm	7.0 - 20.0 g/s

< ECU DIAGNOSIS INFORMATION >

Monitor Item	С	condition	Values/Status
PURG VOL C/V	 Engine: After warming up Selector lever: P or N position Air conditioner switch: OFF 	Idle (Accelerator pedal: Not depressed even slightly, after engine starting.)	0%
	No load	2,000 rpm	_
	Engine: After warming up	Idle	–5 - 5°CA
INT/V TIM (B1)	 Selector lever: P or N position Air conditioner switch: OFF No load 	2,000 rpm	Approx. 0 - 30°CA
	Engine: After warming up	Idle	–5 - 5°CA
INT/V TIM (B2)	 Selector lever: P or N position Air conditioner switch: OFF No load 	2,000 rpm	Approx. 0 - 30°CA
	Engine: After warming up	Idle	0 - 2%
INT/V SOL (B1)	 Selector lever: P or N position Air conditioner switch: OFF No load 	2,000 rpm	Approx. 0 - 50%
	Engine: After warming up	ldle	0 - 2%
INT/V SOL (B2)	Selector lever: P or N positionAir conditioner switch: OFFNo load	2,000 rpm	Approx. 0 - 50%
VIAS S/V-1	 Engine: After warming up Selector lever: P or N position Air conditioner switch: OFF No load 	 Selector lever: P or N position Air conditioner switch: OFF When revving engine up to 5,000 rpm quickly 	
VIAS S/V-2	 Engine: After warming up Selector lever: P or N position Air conditioner switch: OFF No load 	When revving engine up to 5,000 rpm quickly	$OFF \rightarrow ON \rightarrow OFF$
		Air conditioner switch: OFF	OFF
AIR COND RLY	Engine: After warming up, idle the engine	Air conditioner switch: ON (Compressor operates)	ON
ENGINE MOUNT	Engine: After warming up	Below 950 rpm	IDLE
	Engine. Alter warning up	Above 950 rpm	TRVL
FUEL PUMP RLY	 For 1 second after turning ignition Engine running or cranking	switch: ON	ON
	Except above		OFF
VENT CONT/V	Ignition switch: ON		OFF
THRTL RELAY	Ignition switch: ON	1	ON
		Engine coolant temperature: 97°C (206°F) or less	OFF
COOLING FAN	Engine: After warming up, idle the engine	Engine coolant temperature: Between 98°C (208°F) and 99°C (210°F)	LOW
	Air conditioner switch: OFF	Engine coolant temperature: Between 100°C (212°F) and 104°C (219°F)	MID
		Engine coolant temperature: 105°C (221°F) or more	Н
HO2S2 HTR (B1)	- Engine: After warming up	fter the following conditions are met. on 3,500 and 4,000 rpm for 1 minute and at	ON
	Engine speed: Above 3,600 rpm		OFF

< ECU DIAGNOSIS INFORMATION >

[VQ35DE]

Monitor Item	C	Condition	Values/Status
HO2S2 HTR (B2)	 Engine speed: Below 3,600 rpm a Engine: After warming up Keeping the engine speed betwee idle for 1 minute under no load 	ON	
	Engine speed: Above 3,600 rpm		OFF
I/P PULLY SPD	Vehicle speed: More than 20 km/h	n (12 MPH)	Almost the same speed as the tachometer indication
VEHICLE SPEED	Turn drive wheels and compare C cation.	ONSULT value with the speedometer indi-	Almost the same speed as the speedometer indication
IDL A/V LEARN	Engine: Running	Idle air volume learning has not been per- formed yet.	YET
IDL AV LEARN		Idle air volume learning has already been performed successfully.	CMPLT
ENG OIL TEMP	Engine: After warming up	1	More than 70°C (158°F)
TRVL AFTER MIL	Ignition switch: ON	Vehicle has traveled after MIL has illumi- nated.	0 - 65,535 km (0 - 40,723 miles)
A/F S1 HTR (B1)	Engine: After warming up, idle the (More than 140 seconds after star		4 - 100%
A/F S1 HTR (B2)	Engine: After warming up, idle the (More than 140 seconds after star)		4 - 100%
AC PRESS SEN	Engine: IdleBoth A/C switch and blower fan switch	witch: ON (Compressor operates)	1.0 - 4.0 V
VHCL SPEED SE	• Turn drive wheels and compare C cation.	Almost the same speed as the speedometer indication	
SET VHCL SPD	Engine: Running	ASCD: Operating	The preset vehicle speed is displayed
MAIN SW	Ignition switch: ON	MAIN switch: Pressed	ON
		MAIN switch: Released	OFF
CANCEL SW	Ignition switch: ON	CANCEL switch: Pressed	ON
		CANCEL switch: Released	OFF
RESUME/ACC SW	Ignition switch: ON	RESUME/ACCELERATE switch: Pressed	ON
RESUME/ROO SW		RESUME/ACCELERATE switch: Re- leased	OFF
SET SW	Ignition switch: ON	SET/COAST switch: Pressed	ON
3E1 3W	ignition switch. ON	SET/COAST switch: Released	OFF
BRAKE SW1		Brake pedal: Fully released	ON
(Brake pedal posi- tion switch)	Ignition switch: ON	Brake pedal: Slightly depressed	OFF
BRAKE SW2	Ignition switch: ON	Brake pedal: Fully released	OFF
(Stop lamp switch)		Brake pedal: Slightly depressed	ON
VHCL SPD CUT	Ignition switch: ON		NON
LO SPEED CUT	Ignition switch: ON		NON
	Ignition switch: ON		OFF
AT OD CANCEL	Ignition switch: ON	MAIN switch: Pressed at the 1st time \rightarrow	OFF
CRUISE LAMP	Ignition switch: ON	at the 2nd time	$ON \rightarrow OFF$
	MAIN switch: ONWhen vehicle speed is between	ASCD: Operating	ON
SET LAMP	40 km/h (25 MPH) and 144 km/h (89 MPH)	ASCD: Not operating	OFF

< ECU DIAGNOSIS INFORMATION >

[VQ35DE]

Monitor Item	Condition		Values/Status
ALT DUTY	Engine: Idle		0 - 80%
A/F ADJ-B1	Engine: Running		-0.330 - 0.330
A/F ADJ-B2	Engine: Running		-0.330 - 0.330
BAT CUR SEN	 Engine speed: Idle Battery: Fully charged*² Selector lever: P or N position Air conditioner switch: OFF No load 		Approx. 2,600 - 3,500 mV
	Power generation voltage variable	e control: Operating	ON
ALT DUTY SIG	Power generation voltage variable	e control: Not operating	OFF
EVAP LEAK DIAG	Ignition switch: ON		Indicates the condition of EVAP leak diagnosis.
EVAP DIAG READY	Ignition switch: ON		Indicates the ready condition of EVAP leak diagnosis.
HO2 S2 DIAG1 (B1)	DTC P0139 self-diagnosis (delayed	response) is incomplete.	INCMP
	DTC P0139 self-diagnosis (delayed	response) is complete.	CMPLT
HO2 S2 DIAG1 (B2)	DTC P0159 self-diagnosis (delayed	response) is incomplete.	INCMP
	DTC P0159 self-diagnosis (delayed	l response) is complete.	CMPLT
HO2 S2 DIAG2 (B1)	DTC P0139 self-diagnosis (slow res	sponse) is incomplete.	INCMP
	DTC P0139 self-diagnosis (slow reading the self-diagnosis)	sponse) is complete.	CMPLT
HO2 S2 DIAG2 (B2)	DTC P0159 self-diagnosis (slow read	sponse) is incomplete.	INCMP
	DTC P0159 self-diagnosis (slow reading the self-diagnosis)	sponse) is complete.	CMPLT
THRTL STK CNT B1 ^{*3}	_		_
BAT TEMP SEN	 Engine: After warming up Selector lever: P or N position Air conditioner switch: OFF No load 	ldle	Indicates the temperature around the battery.
FUEL PUMP DUTY	 Engine: After warming up Selector lever: P or N position Air conditioner switch: OFF No load 	ldle	30 – 40%
	Engine: After warming up	ldle	Approx. 1.45 V
EOP SENSOR	 Selector lever: P or N Air conditioner switch: OFF No load 	2,000 rpm	Approx. 2.85 V
/TC DTY EX B1 ^{*3}			
VTC DTY EX B2 ^{*3}			
A/F-S ATMSPHRC CRCT B1	Engine: After warming up, idle the e	engine	Varies depending on vehicle environment.
A/F-S ATMSPHRC CRCT B2	Engine: After warming up, idle the e	engine	Varies depending on vehicle environment.
A/F-S ATMSPHRC CRCT UP B1	Engine: Running		Varies depending on the number of updates.
SYSTEM 1 DIAG-	DTC P219A self-diagnosis is incom	plete.	INCMP
NOSIS A B1	DTC P219A self-diagnosis is incom	plete.	CMPLT
SYSTEM 1 DIAG-	DTC P219B self-diagnosis is incom	iplete.	INCMP
NOSIS A B2	DTC P219B self-diagnosis is incom	iplete.	CMPLT
SYSTEM 1 DIAG-	DTC P219A self-diagnosis is on sta	andby.	ABSENT
NOSIS B B1	DTC P219A self-diagnosis is under	diagnosis.	PRSENT

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< ECU DIAGNOSIS INFORMATION >

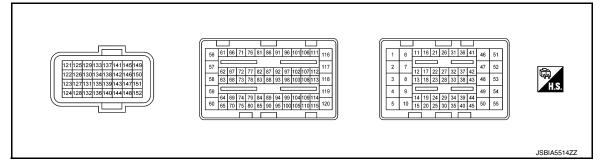
Monitor Item	Condition	Values/Status			
SYSTEM 1 DIAG- NOSIS B B2	DTC P219B self-diagnosis is on standby.	ABSENT			
	DTC P219B self-diagnosis is under diagnosis.	PRSENT			
A/F-S ATMSPHRC CRCT UP B2	Engine: Running	Varies depending on the number of updates.			

*1: Accelerator pedal position sensor 2 signal and throttle position sensor 2 signal are converted by ECM internally. Thus, they differ from ECM terminals voltage signal.

*2: Before measuring the terminal voltage, confirm that the battery is fully charged. Refer to <u>PG-128</u>, "<u>How to</u> <u>Handle Battery</u>".

*3: The item is indicated, but not used.

TERMINAL LAYOUT



PHYSICAL VALUES

NOTE:

- · ECM is located in the engine room left side near battery.
- Specification data are reference values.
- Pulse signal is measured by CONSULT.

Termina	al No.	Description			Value	
+		Signal name	Input/ Output	Condition	(Approx.)	
1 (P)	152 (B)	Throttle control motor (Close)	Output	 [Ignition switch: ON] Engine stopped Selector lever: D position Accelerator pedal: Fully released 	0 - 14 V★ 500µSec/div 5V/div JMBIA1125GB	
2 (G/W)	152 (B)	Throttle control motor power supply	Input	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)	

< ECU DIAGNOSIS INFORMATION >

Terminal No.		Description			Value
+		Signal name	Input/ Output	Condition	(Approx.)
3	152	Throttle control motor (Open)	Outout	 [Ignition switch: ON] Engine stopped Selector lever: D position Accelerator pedal: Fully depressed 	0 - 14 V★ 500µSec/div
(L)	(B)		Output	 [Ignition switch: ON] Engine stopped Selector lever: D position Accelerator pedal: Fully released 	0 - 14 V★ 500µSec/div
4 (GR)	_	Sensor ground [Knock sensor (bank 1), Knock sensor (bank 2)]	_	_	_
5 (B)	4 (GR)	Knock sensor (bank 1)	Input	[Engine is running] Idle speed	2.5 V* ¹
6 (BR/Y)	152 (B)	A/F sensor 1 heater (bank 1)	Output	 [Engine is running] Warm-up condition Idle speed (More than 140 seconds after starting engine) 	2.9 - 8.8 V★ 50mSec/div 50m
7 152 Heated oxygen senso (P/B) (B) er (bank 1)	,,	Output	 [Engine is running] Engine speed: Below 3,600 rpm after the following conditions are met Engine: after warming up Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load 	10 V★ 50mSec/div 50mSec/div	
				 [Ignition switch: ON] Engine stopped [Engine is running] Engine speed: Above 3,600 rpm 	BATTERY VOLTAGE (11 - 14 V)
8 (O)	152 (B)	Throttle control motor relay	Output	[Ignition switch: $ON \rightarrow OFF$]	0 - 1.0 V → BATTERY VOLTAGE (11 - 14 V) → 0 V
				[Ignition switch: ON]	0 - 1.0 V
9 (W)	4 (GR)	Knock sensor (bank 2)	Input	[Engine is running] Idle speed	2.5 V* ¹
10 (B)	—	ECM ground	_	_	_

< ECU DIAGNOSIS INFORMATION >

Termin	al No.	Description			Value
+		Signal name	Input/ Output	Condition	(Approx.)
11 (L/W) 12 (LG/R) 16 (R/W)	152	Fuel injector No. 5 Fuel injector No. 4 Fuel injector No. 2		[Engine is running]Warm-up conditionEngine speed: 2,000 rpm	BATTERY VOLTAGE (11 - 14 V)★ 50mSec/div
17 (R/B) 21 (P/B) 22 (R/Y)	152 (B) Fuel injector No. 1 Fuel injector No. 6 Fuel injector No. 3	Output	 [Engine is running] Warm-up condition Idle speed NOTE: The pulse cycle changes depending on rpm at idle 	BATTERY VOLTAGE (11 - 14 V)★ 50mSec/div 50mSec/div 10V/div JMBIA0047GB	
13 (G)	15 (B)	Engine oil temperature sensor	Input	[Engine is running]	0 - 4.8 V Output voltage varies with engine oil temperature.
14 (LG)	18 (Y)	Engine oil pressure sensor	Input	 [Engine is running] Warm-up condition Idle speed [Engine is running] Warm-up condition Engine speed is 2,000 rpm 	I.3 V★ 5mSec/div 5mSec/div 2V/div JPBIA3369ZZ 2.7 V★ 5mSec/div 1.3 V★ 2V/div JPBIA3369ZZ
15 (B)	_	Sensor ground (Engine oil temperature sen- sor, engine oil pressure sen- sor)	_	_	_
18 (Y)	15 (B) 25 (G)	Sensor power supply (Engine oil pressure sensor) Sensor power supply (Refrigerant pressure sensor)		[Ignition switch: ON]	5 V
19 (B)	152 (B)	Fuel pump relay	Output	 [Ignition switch: ON] For 1 second after turning ig- nition switch ON [Engine is running] 	0 - 1.0 V
20 (R)	25 (G)	Refrigerant pressure sensor	Input	 [Engine is running] Warm-up condition Both A/C switch and blower fan motor switch: ON (Com- pressor operates) 	1.0 - 4.0 V

< ECU DIAGNOSIS INFORMATION >

[VQ35DE]

Termin	al No.	Description			Value	
+		Signal name	Input/ Output	Condition	(Approx.)	A
25 (G)	_	Sensor ground (Refrigerant pressure sensor)	—	_	_	EC
28 (BR)	40 (LG)	Sensor power supply [Exhaust valve timing control position sensor (bank 1), ex- haust valve timing control po- sition sensor (bank 2), crankshaft position sensor (POS), mass air flow sensor]	Input	[Engine is running]	5 V	C
31 (Y)	35 (B)	Engine coolant temperature sensor	Input	[Engine is running]	0 - 4.8 V Output voltage varies with engine coolant temperature.	E
32 (W/L)	152 (B)	Heated oxygen sensor 2 (bank 2)	Input	 [Engine is running] Revving engine from idle to 3,000 rpm quickly after the following conditions are met Engine: after warming up Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load 	0 - 1.0 V	F
34 (L/Y)	40 (LG)	Intake air temperature sensor	Input	[Engine is running]	0 - 4.8 V Output voltage varies with intake air temperature.	Η
35 (B)	_	Sensor ground (Heated oxygen sensor 2, en- gine coolant temperature sen- sor)	_	_	_	I
36	40	Crankshaft position sensor	Inout	 [Engine is running] Warm-up condition Idle speed NOTE: The pulse cycle changes depending on rpm at idle 	4.0 - 5.0 V★ 1mSec/div ↓ ↓ ↓ ↓ 2V/div JMBIA0041GB	J K L
(W/B)	(LG)	(POS)	Input	[Engine is running] Engine speed: 2,000 rpm	4.0 - 5.0 V★ 1mSec/div € 2V/div JMBIA0042GB	M

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< ECU DIAGNOSIS INFORMATION >

	Termina	al No.	Description			
_	+		Signal name	Input/ Output	Condition	Value (Approx.)
_	37	152	Exhaust valve timing control	Inout	 [Engine is running] Warm-up condition Idle speed NOTE: The pulse cycle changes depending on rpm at idle 	4.0 - 5.0 V★ 20mSec/div ÷ 2V/div JMBIA0043GB
	(GR)		[Engine is running]Warm-up conditionEngine speed: 2,000 rpm	4.0 – 5.0 V★ 20mSec/div 2V/div JMBIA0044GB		
			Mass air flow sensor	Input	[Ignition switch: ON] • Engine stopped	3,720 Hz 2mSec/div
	38 (O)	40 (LG)			[Engine is running] • Warm-up condition • Idle speed	4,100 – 4,700 Hz 2mSec/div
_					 [Engine is running] Warm-up condition Engine speed: idle to about 4,000 rpm NOTE: Check for linear frequency rise in response to engine being increased to about 4,000 rpm 	$4,100 - 4,700 \rightarrow 8000 \text{ Hz}$ 2mSec/div

< ECU DIAGNOSIS INFORMATION >

Termin	al No.	Description			Value
+		Signal name	Input/ Output	Condition	(Approx.)
39 152 6	Exhaust valve timing control	Input	 [Engine is running] Warm-up condition Idle speed NOTE: The pulse cycle changes depending on rpm at idle 	4.0 - 5.0 V★ 20mSec/div € 2V/div JMBIA0043GB	
(LG)	(LG) (B) position sensor (bank 2)	mput	[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	4.0 - 5.0 V★ 20mSec/div € 2V/div JMBIA0044GB	
40 (LG)	_	Sensor ground (Exhaust valve timing control position sensor (bank 1), ex- haust valve timing control po- sition sensor (bank 2), crankshaft position sensor (POS), mass air flow sensor)	_	_	_
41 (W)	152 (B)	Heated oxygen sensor 2 (bank 1)	Input	 [Engine is running] Revving engine from idle to 3,000 rpm quickly after the following conditions are met Engine: after warming up Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load 	0 - 1.0 V
46 (SB)	152 (B)	A/F sensor 1 heater (bank 2)	Output	 [Engine is running] Warm-up condition Idle speed (More than 140 seconds after starting engine) 	2.9 - 8.8 V★ 50mSec/div =
47 (R)	152 (B)	Heated oxygen sensor 2 heat- er (bank 2)	Output	 [Engine is running] Engine speed: Below 3,600 rpm after the following conditions are met Engine: after warming up Keeping the engine speed be- tween 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load 	10 V★ 50mSec/div
			 [Ignition switch: ON] Engine stopped [Engine is running] Engine speed: Above 3,600 rpm 	BATTERY VOLTAGE (11 - 14 V)	

< ECU DIAGNOSIS INFORMATION >

[VQ35DE]

Termina	al No.	Description			Value
+		Signal name	Input/ Output	Condition	(Approx.)
49	152	Electronic controlled engine		[Engine is running] Idle speed	0 - 1.0 V
(BR/W)	(B)	mount control solenoid valve	Output	[Engine is running] Engine speed: More than 950 rpm	BATTERY VOLTAGE (11 - 14 V)
51 (L)	152 (B)	Power supply for ECM (Valve)	Input	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V) BATTERY VOLTAGE
54 (P/L)	152 (B)	1 0	Output	 [Engine is running] Idle speed Accelerator pedal: Not depressed even slightly, after engine starting 	(11 - 14 V)★ 50mSec/div 50mSec/div 10V/div JMBIA0039GB BATTERY VOLTAGE
				[Engine is running] Engine speed: approximately 2,000 rpm (More than 100 sec- onds after starting engine)	(11 - 14 V)★ 50mSec/div 10V/div JMBIA0040GB
55 (B/Y)	_	ECM ground	—	_	_
58	152	Exhaust valve timing control	Output	[Engine is running]Warm-up conditionIdle speed	0 V
(P/B)	(B)	solenoid valve (bank 1)	Output	[Engine is running]Warm-up conditionEngine speed: 2,000rpm	BATTERY VOLTAGE (11 – 14 V)
60	152	Exhaust valve timing control	Output	[Engine is running]Warm-up conditionIdle speed	0 V
(W)	(B)	solenoid valve (bank 2)	Output	[Engine is running]Warm-up conditionEngine speed: 2,000rpm	BATTERY VOLTAGE (11 – 14 V)
64 (G/B)	_	Sensor ground (Battery current sensor, bat- tery temperature sensor)	_	_	_
66 (L)	152 (B)	A/F sensor 1 (bank 1)	Input	[Engine is running]Warm-up conditionEngine speed: 2,000 rpm	1.8 V
67 (P)	152 (B)	A/F sensor 1 (bank 1)	Input	[Ignition switch: ON]	2.2 V Output voltage varies with air fuel ratio.
68 (W)	_		_		
69 (BR)	_	-	_	-	_
70 (GR)	_	Shield	_	_	_

< ECU DIAGNOSIS INFORMATION >

Termin	al No.	Description			Value	
+		Signal name	Input/ Output	Condition	Value (Approx.)	A
71	152	Throttle position sensor 1	Input	 [Ignition switch: ON] Engine stopped Selector lever: D position Accelerator pedal: Fully released 	More than 0.36 V	EC C
(W)	(B)		input	 [Ignition switch: ON] Engine stopped Selector lever: D position Accelerator pedal: Fully depressed 	Less than 4.75 V	D
72	152	T he state of the		 [Ignition switch: ON] Engine stopped Selector lever: D position Accelerator pedal: Fully released 	Less than 4.75 V	E
(R)	(B)	Throttle position sensor 2	Input	 [Ignition switch: ON] Engine stopped Selector lever: D position Accelerator pedal: Fully depressed 	More than 0.36 V	F
75 (B)	_	Sensor ground (Throttle position sensor)	_	_	_	Н
76 (LG)	152 (B)	A/F sensor 1 (bank 2)	Input	[Engine is running]Warm-up conditionEngine speed: 2,000 rpm	1.8 V	
77 (V)	152 (B)	A/F sensor 1 (bank 2)	Input	[Ignition switch: ON]	2.2 V Output voltage varies with air fuel ratio.	I
80 (GR)		Shield	_	_	_	J
83	152			[Ignition switch: ON] Selector lever: P or N position	BATTERY VOLTAGE (11 - 14 V)	K
(R)	(B)	PNP signal	Input	[Ignition switch: ON] Selector lever: Except above position	0 V	L
84	90	Camshaft position sensor	lanut	 [Engine is running] Warm-up condition Idle speed NOTE: The pulse cycle changes depending on rpm at idle 	3.0 - 5.0 V★ 20mSec/div 20mSec/div 20V/div JMBIA0045GB	M
(W/R)		Input	[Engine is running] Engine speed is 2,000 rpm	3.0 - 5.0 V★ 20mSec/div 	O	

< ECU DIAGNOSIS INFORMATION >

Termin	al No.	Description			Value
+		Signal name	Input/ Output	Condition	(Approx.)
86 (W/B)		ECM relay (Self shut-off)	Output	 [Engine is running] [Ignition switch: OFF] A few seconds after turning ignition switch OFF 	0 - 1.5 V
(1110)	(5)			[Ignition switch: OFF] More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14 V)
87 (R/Y)	64 (G/B)	Sensor power supply (Battery current sensor)	_	[Ignition switch: ON]	5 V
89	90	Camshaft position sensor	Inout	 [Engine is running] Warm-up condition Idle speed NOTE: The pulse cycle changes depending on rpm at idle 	3.0 - 5.0 V★ 20mSec/div € 2V/div JMBIA0045GB
(BR/W)		Input	[Engine is running] Engine speed is 2,000 rpm	3.0 - 5.0 V★ 20mSec/div 20mSec/div 20/div JMBIA0046GB	
90 (B/R)	_	Sensor ground [Camshaft position sensor (PHASE) (bank 1), camshaft position sensor (PHASE) (bank 2)]	_	_	_
92 (G/W)	90 (B/R)	Sensor power supply [Camshaft position sensor (PHASE) (bank 1), camshaft position sensor (PHASE) (bank 2)]	_	[Ignition switch: ON]	5 V
98 (G)	75 (B)	Sensor power supply (Throttle position sensor)	_	[Ignition switch: ON]	5 V
101	10	Starter motor relay cut off sig-		[Ignition switch: ON]	0 V
(P)	(B)	nal	Output	[Engine is running] Idle speed 	BATTERY VOLTAGE (11 - 14 V)
				[Engine is running]Warm-up conditionIdle speed	BATTERY VOLTAGE (11 - 14 V)
102 (GR/B)	152 (B)	VIAS control solenoid valve 2	Output	[Engine is running]Warm-up conditionWhen revving engine up to 5,000 rpm quickly	BATTERY VOLTAGE (11 - 14 V) ↓ 0 - 1.0 V ↓ BATTERY VOLTAGE (11 - 14 V)

< ECU DIAGNOSIS INFORMATION >

Termin	al No.	Description			Value	,
+		Signal name	Input/ Output	Condition	(Approx.)	/-
103 (L/B) 104 (GR/R) 106 (G/R)	152	Ignition signal No. 3 Ignition signal No. 6 Ignition signal No. 2	Output	 [Engine is running] Warm-up condition Idle speed NOTE: The pulse cycle changes depending on rpm at idle 	0 - 0.2 V★ 50mSec/div € 2V/div JMBIA0035GB	E
107 (P) 113 (Y/R) 114 (W)	(B)	Ignition signal No. 5 Ignition signal No. 1 Ignition signal No. 4	Output	[Engine is running]Warm-up conditionEngine speed: 2,000 rpm	0.1 - 0.4 V★ 50mSec/div 	E
105 (B)		ECM ground		_	_	(
108 (V)	152 (B)	VIAS control solenoid valve 1	Output	 [Engine is running] Warm-up condition Idle speed [Engine is running] Warm-up condition When revving engine up to 5,000 rpm quickly 	BATTERY VOLTAGE (11 - 14 V) BATTERY VOLTAGE (11 - 14 V) \downarrow 0 - 1.0 V \downarrow	H
110 (B)		ECM ground	_	_	BATTERY VOLTAGE (11 - 14 V) —	
116 (W/L)	152 (B)	Power supply for ECM (Back- up)	Input	[Ignition switch: OFF]	BATTERY VOLTAGE (11 - 14 V)	
117 (R)	152 (B)	Intake valve timing control so- lenoid valve (bank 1)	Output	 [Engine is running] Warm-up condition Idle speed [Engine is running] Warm-up condition When revving engine up to 2,000rpm quickly 	0 V BATTERY VOLTAGE (11 - 14 V)	ŀ
118 (V)	152 (B)	Intake valve timing intermedi- ate lock control solenoid valve (bank 1)	Output	 [Engine is running] Warm-up condition Idle speed [Engine is running] Cold condition [Engine cool- ant temperature: below 60°C (140°F)] Idle speed 	0 V Battery voltage (11 - 14 V)	1
119 (Y)	152 (B)	Intake valve timing control so- lenoid valve (bank 2)	Output	 [Engine is running] Warm-up condition Idle speed [Engine is running] Warm-up condition When revving engine up to 2,000rpm quickly 	0 V BATTERY VOLTAGE (11 - 14 V)	

< ECU DIAGNOSIS INFORMATION >

Termin	al No.	Description			Value
+		Signal name	Input/ Output	Condition	Value (Approx.)
		Intake valve timing intermedi-		[Engine is running]Warm-up conditionIdle speed	0 V
120 (BR)	152 (B)	ate lock control solenoid valve (bank 2)	Output	 [Engine is running] Cold condition [Engine cool- ant temperature: below 60°C (140°F)] Idle speed 	Battery voltage (11 - 14 V)
121 (LG)	148 (V)	EVAP control system pres- sure sensor	Input	[Ignition switch: ON]	1.8 - 4.8 V
123 (P)	_	CAN communication line (CAN-L)	Input/ Output	_	_
124 (L)	_	CAN communication line (CAN-H)	Input/ Output	_	_
125 (W)	148 (V)	Sensor power supply (EVAP control system pres- sure sensor)	_	[Ignition switch: ON]	5 V
128 (Y)	148 (V)	Fuel tank temperature sensor	Input	[Engine is running]	0 - 4.8 V Output voltage varies with fuel tank temperature.
100	150			[Ignition switch: OFF]	0 V
133 (BR)	(B)	Ignition switch	Input	[Ignition switch: ON]	Battery voltage (11 - 14 V)
				[Ignition switch: ON] ASCD steering switch: OFF	4 V
			Input	[Ignition switch: ON] MAIN switch: Pressed	0 V
134 (Y)	135 (BR)	ASCD steering switch		Input	[Ignition switch: ON] CANCEL switch: Pressed
	()	()		[Ignition switch: ON] RESUME/ACCELERATE switch: Pressed	3 V
				[Ignition switch: ON] SET/COAST switch: Pressed	2 V
135 (BR)	_	Sensor ground (ASCD steering switch)	_	—	
139	(B) C 135 (BR) ASCD steering switch Sensor ground	Input	[Ignition switch: OFF] Brake pedal: Fully released	0 V	
(SB)	(B)		mput	[Ignition switch: OFF] Brake pedal: Slightly depressed	BATTERY VOLTAGE (11 - 14 V)
140	152	Brake padal position switch	loout	[Ignition switch: ON] Brake pedal: Slightly depressed	0 V
(BR)	(B)	Brake pedal position switch	Input	[Ignition switch: ON] Brake pedal: Fully released	BATTERY VOLTAGE (11 - 14 V)
141 (V)	152 (B)	EVAP canister vent control valve	Output	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)
142 (GR)	144 (G)	Sensor power supply (Accelerator pedal position sensor 2)	_	[Ignition switch: ON]	5 V

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Termin	al No.	Description			Value	
+		Signal name	Input/ Output	Condition	(Approx.)	_
143	144	Accelerator pedal position	laput	[Ignition switch: ON]Engine stoppedAccelerator pedal: Fully released	0.25 - 0.50 V	
(0)	(G)	sensor 2	Input	 [Ignition switch: ON] Engine stopped Accelerator pedal: Fully depressed 	2.0 - 2.5 V	_
144 (G)	_	Sensor ground (Accelerator pedal position sensor 2)	_	_	_	-
145 (L)	152 (B)	Power supply for ECM	Input	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)	-
146 (P)	151 (B)	Sensor power supply (Accelerator pedal position sensor 1)	_	[Ignition switch: ON]	5 V	-
147 (B) 149 (B) 152 (B)		ECM ground	_	_	_	_
148 (V)		Sensor ground (EVAP control system pres- sure sensor, Fuel tank tem- perature sensor)	_	_	_	_
150	151	Accelerator pedal position	Input	 [Ignition switch: ON] Engine stopped Accelerator pedal: Fully released 	0.5 - 1.0 V	_
(W) (B)	sensor 1	mput	[Ignition switch: ON]Engine stoppedAccelerator pedal: Fully depressed	4.2 - 4.8 V	_	
151 (B)	_	Sensor ground (Accelerator pedal position sensor 1)		_		_

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

*1: This may vary depending on internal resistance of the tester.

*2: Before measuring the terminal voltage, confirm that the battery is fully charged. Refer to PG-128, "How to Handle Battery".

Fail-safe

INFOID:000000012406313

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DTC No.	Detected items	Engine operating condition in fail-safe mode
P0011 P0021	Intake valve timing control	The signal is not energized to the intake valve timing control solenoid valve and the valve control does not function.
P0014 P0024	Exhaust valve timing con- trol	The signal is not energized to the exhaust valve timing control solenoid valve and the valve control does not function.
P0101 P0102 P0103	Mass air flow sensor circuit	Engine speed will not rise more than 2,400 rpm due to the fuel cut.

EC-99

[VQ35DE]

ECM

< ECU DIAGNOSIS INFORMATION >

DTC No.	Detected items	Engine operating condition in fail-safe mode							
P0117 P0118	Engine coolant tempera- ture sensor circuit	Engine coolant temperature will be CONSULT displays the engine cool	determined by ECM based on the following condition. lant temperature decided by ECM.						
		Condition	Engine coolant temperature decided (CONSULT display)						
		Just as ignition switch is turned ON or START	40°C (104°F)						
		Approx 4 minutes or more after en- gine starting	80°C (176°F)						
		Except as shown above	40 - 80°C (104 - 176°F) (Depends on the time)						
		When the fail-safe system for engin fan operates while engine is runnin	e coolant temperature sensor is activated, the cooling g.						
P0122 P0123 P0222 P0223 P2135	Throttle position sensor	order for the idle position to be with	eed of the throttle valve to be slower than the normal						
P0196 P0197 P0198	Engine oil temperature sensor	Intake valve timing control does not function.							
P0500	Vehicle speed sensor	The cooling fan operates (Highest)	while engine is running.						
P052A P052B P052C P052D	Intake valve timing inter- mediate lock control	_							
P0603 P0607	ECM	Engine torque may be limited.							
P0604	ECM	 ECM stops the electric throttle co fixed opening (approx. 5 degrees The position of the following com Intake valve timing control solence Intake valve timing intermediate I Exhaust valve timing control sole ASCD operation may be deactive 	ponents is fixed. bid valve lock control solenoid valve noid valve						
P0605 P0606 P060B	ECM	 ASCD operation may be deactivated. NOTE: Fail-safe may not occur depending on malfunction type. ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring. The position of the following components is fixed. Intake valve timing control solenoid valve Intake valve timing intermediate lock control solenoid valve Exhaust valve timing control solenoid valve ASCD operation may be deactivated. 							
P060A	ECM	 NOTE: Fail-safe may not occur depending ECM stops the electric throttle co fixed opening (approx. 5 degrees The position of the following com Intake valve timing control solence Intake valve timing intermediate I Exhaust valve timing control sole Engine torque may be limited. ASCD operation may be deactive 	ntrol actuator control, throttle valve is maintained at a b) by the return spring. ponents is fixed. bid valve lock control solenoid valve noid valve						

< ECU DIAGNOSIS INFORMATION >

DTC No.	Detected items	Engine operating condition in fail-safe mode						
P0643	Sensor power supply	 ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring. The position of the following components is fixed. Intake valve timing control solenoid valve Intake valve timing intermediate lock control solenoid valve Exhaust valve timing control solenoid valve 						
P1805	Brake switch	ECM controls the electric throttle control actuator by regulating the throttle opening to a small range. Therefore, acceleration will be poor.						
		Vehicle condition	Driving condition	D				
		When engine is idling	Normal	D				
		When accelerating	Poor acceleration					
P2100 P2103	Throttle control motor relay	ECM stops the electric throttle cont fixed opening (approx. 5 degrees) b	rol actuator control, throttle valve is maintained at a by the return spring.	E				
P2101	Electric throttle control function	ECM stops the electric throttle cont fixed opening (approx. 5 degrees) b	rol actuator control, throttle valve is maintained at a by the return spring.	F				
P2118	Throttle control motor	ECM stops the electric throttle cont fixed opening (approx. 5 degrees) b	rol actuator control, throttle valve is maintained at a by the return spring.					
P2119	Electric throttle control ac- tuator	malfunction:)	tor does not function properly due to the return spring ctuator by regulating the throttle opening around the not rise more than 2,000 rpm.	G				
			in fail-safe mode is not in specified range:) ontrol actuator by regulating the throttle opening to 20	Η				
		(When ECM detects the throttle valve is stuck open:) While the vehicle is being driven, it slows down gradually because of fuel cut. After the vehicle stops, the engine stalls. The engine can restart in the N or P position, and engine speed will not exceed 1,000 rpm						
P2122 P2123 P2127 P2128 P2138	Accelerator pedal position sensor	 The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. Therefore, the acceleration will be poor. 						

DTC Inspection Priority Chart

INFOID:000000012406314

[VQ35DE]

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

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< ECU DIAGNOSIS INFORMATION >

Priority	Detected items (DTC)
1	 U0101 U1000 CAN communication line P0101 P0102 P0103 Mass air flow sensor P0111 P0112 P0113 P0127 Intake air temperature sensor P0116 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 P0196 P0197 P0198 Engine oil temperature sensor P0327 P0328 P0332 P0333 Knock sensor P0335 Crankshaft position sensor (POS) P0340 P0345 Camshaft position sensor (PHASE) P0460 P0461 P0462 P0463 Fuel level sensor P0500 Vehicle speed sensor P0500 Vehicle speed sensor P0500 Sensor P0643 Sensor power supply P0850 Park/Neutral position (PNP) switch P1078, P1084 Exhaust valve timing control position sensor P1556 P1557 Battery temperature sensor P1650 Starter motor relay 2 P1651 Starter motor relay 2 P1652 Starter motor relay 4 P1652 Starter motor communication line P2122 P2123 P2127 P2128 P2138 Accelerator pedal position sensor
2	 P0030 P0031 P0032 P0036 P0051 P0052 Air fuel ratio (A/F) sensor 1 heater P0037 P0038 P0057 P0058 P0141 P0161 Heated oxygen sensor 2 heater P0078, P0084 Exhaust valve timing control solenoid valve P0075 P0081 Intake valve timing control solenoid valve P0130 P0131 P0132 P014C P014D P014E P0150 P0151 P0152 P015A P015B P015C P015D P2096 P2097 P2098 P2099 Air fuel ratio (A/F) sensor 1 P0137 P0138 P0139 P0157 P0158 P0159 Heated oxygen sensor 2 P0441 EVAP control system purge flow monitoring P0443 P0444 P0445 EVAP canister purge volume control solenoid valve P0451 P0452 P0453 EVAP control system pressure sensor P1217 Engine over temperature (OVERHEAT) P1800 P1801 VIAS control solenoid valve P2100 P2103 Throttle control motor relay P2118 Throttle control motor
3	 P0011 P0021 P052A P052B P052C P052D Intake valve timing control P0014, P0024 Exhaust valve timing control P0171 P0172 P0174 P0175 Fuel injection system function P0300 - P0306 Misfire P0420 P0430 Three way catalyst function P0456 EVAP control system (SMALL LEAK, VERY SMALL LEAK) P0506 P0507 Idle speed control system P050A P050E Cold start control P0524 Engine oil pressure P1148 P1168 Closed loop control P1212 TCS communication line P1564 ASCD steering switch P1572 Brake pedal position switch P1574 ASCD vehicle speed sensor P1715 Primary speed sensor P2198 P2198 Air fuel ratio (A/F) sensor 1

< ECU DIAGNOSIS INFORMATION >

DTC Index

[VQ35DE]

INFOID:000000012406315

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 \times :Applicable —: Not applicable

DTC	C*1	Itoma	SRT			Permanent	Dofor	EQ.
CONSULT GST ^{*2}	ECM ^{*3}	Items (CONSULT screen terms)	code	Trip	MIL	DTC group ^{*4}	Refer- ence page	EC
U0101	0101 ^{*5}	LOST COMM (ECM)	_	1	×	В	<u>EC-179</u>	С
U1000	1000 ^{*5}	CAN COMM CIRCUIT	_	2	_	_	<u>EC-180</u>	
P0000	0000	NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED.	_		Blinking ^{*8}		_	D
P0011	0011	INT/V TIM CONT-B1	×	2	×	В	<u>EC-181</u>	
P0014	0014	EXH/V TIM CONT-B1		2	×	В	<u>EC-184</u>	E
P0021	0021	INT/V TIM CONT-B2	×	2	×	В	<u>EC-181</u>	
P0024	0024	EXH/V TIM CONT-B2	_	2	×	В	<u>EC-184</u>	F
P0030	0030	A/F SEN1 HTR (B1)		2	×	В	<u>EC-190</u>	
P0031	0031	A/F SEN1 HTR (B1)	_	2	×	В	<u>EC-190</u>	
P0032	0032	A/F SEN1 HTR (B1)		2	×	В	<u>EC-190</u>	G
P0036	0036	A/F SEN1 HTR (B2)	_	2	×	В	<u>EC-190</u>	
P0037	0037	HO2S2 HTR (B1)	_	2	×	В	<u>EC-193</u>	Н
P0038	0038	HO2S2 HTR (B1)	_	2	×	В	<u>EC-193</u>	H
P0051	0051	A/F SEN1 HTR (B2)		2	×	В	<u>EC-190</u>	
P0052	0052	A/F SEN1 HTR (B2)		2	×	В	<u>EC-190</u>	
P0057	0057	HO2S2 HTR (B2)	_	2	×	В	EC-193	
P0058	0058	HO2S2 HTR (B2)	_	2	×	В	<u>EC-193</u>	
P0075	0075	INT/V TIM V/CIR-B1	_	2	×	В	<u>EC-196</u>	J
P0078	0078	EX V/T ACT/CIRC-B1		2	×	В	EC-198	
P0081	0081	INT/V TIM V/CIR-B2	_	2	×	В	EC-196	K
P0084	0084	EX V/T ACT/CIRC-B2		2	×	В	EC-198	
P0101	0101	MAF SEN/CIRCUIT-B1	_	2	×	В	EC-201	
P0102	0102	MAF SEN/CIRCUIT-B1	_	1	×	В	EC-206	L
P0103	0103	MAF SEN/CIRCUIT-B1		1	×	В	EC-206	
P0111	0111	IAT SENSOR 1 B1	_	2	×	A	EC-211	Μ
P0112	0112	IAT SEN/CIRCUIT-B1	_	2	×	В	EC-213	IVI
P0113	0113	IAT SEN/CIRCUIT-B1	_	2	×	В	EC-213	
P0116	0116	ECT SEN/CIRC		2	×	А	EC-215	Ν
P0117	0117	ECT SEN/CIRC		1	×	В	<u>EC-217</u>	
P0118	0118	ECT SEN/CIRC	_	1	×	В	<u>EC-217</u>	0
P0122	0122	TP SEN 2/CIRC-B1		1	×	В	<u>EC-219</u>	0
P0123	0123	TP SEN 2/CIRC-B1		1	×	В	<u>EC-219</u>	
P0125	0125	ECT SENSOR	_	2	×	В	EC-222	Р
P0127	0127	IAT SENSOR-B1	_	2	×	В	<u>EC-224</u>	
P0128	0128	THERMSTAT FNCTN		2	×	A	<u>EC-226</u>	
P0130	0130	A/F SENSOR1 (B1)	_	2	×	A	<u>EC-229</u>	
P0131	0131	A/F SENSOR1 (B1)	_	2	×	В	<u>EC-233</u>	
P0132	0132	A/F SENSOR1 (B1)	_	2	×	В	<u>EC-236</u>	

< ECU DIAGNOSIS INFORMATION >

tems SRT Trip ML Permanuf* Reference GST2 ECM*3 CONSULT screen terms) x 2 x A EC.239 P0137 0137 HO252 (81) x 2 x A EC.239 P0138 0138 HO252 (81) x 2 x A EC.239 P0147 0141 HO252 (81) x 2 x A EC.231 P0140 0141 HO252 (81) x 2 x A EC.261 P0141 0141 AF SENSOR1 (82) x 2 x A EC.261 P0141 0144 AF SENSOR1 (82) 2 x A EC.261 P0150 0150 AF SENSOR1 (82) 2 x A EC.262 P0151 0151 AF SENSOR1 (82) - 2 x A EC.261 P0150 0150 AF SENSOR1 (81) x 2	DT	C ^{*1}		0.57			Permanent	D. (
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$		ECM ^{*3}			Trip	MIL		
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	P0137	0137	HO2S2 (B1)	×	2	×	A	<u>EC-239</u>
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	P0138	0138	HO2S2 (B1)	×	2	×	A	<u>EC-245</u>
P014C 014C AF SENSOR1 (B1) × 2 × A EC:201 P014D 014D AF SENSOR1 (B1) × 2 × A EC:201 P014E 014E AF SENSOR1 (B2) × 2 × A EC:201 P014F 014F AF SENSOR1 (B2) - 2 × A EC:201 P0150 0150 AF SENSOR1 (B2) - 2 × A EC:223 P0151 0151 AF SENSOR1 (B2) - 2 × A EC:233 P0152 0152 AF SENSOR1 (B2) - 2 × A EC:232 P0151 0154 HO252 (B2) × 2 × A EC:242 P0159 0150 AF SENSOR1 (B1) × 2 × A EC:261 P0150 0150 AF SENSOR1 (B2) × 2 × A EC:261 P0150 0150 AF SENSOR1 (B	P0139	0139	HO2S2 (B1)	×	2	×	A	<u>EC-252</u>
P014D 014D AF SENSOR1 (B1) × 2 × A EC201 P014E 014E AF SENSOR1 (B2) × 2 × A EC201 P014F 014F AF SENSOR1 (B2) × 2 × A EC201 P0150 0150 AF SENSOR1 (B2) 2 × A EC233 P0151 0151 AF SENSOR1 (B2) 2 × A EC233 P0152 0152 AF SENSOR1 (B2) 2 × A EC238 P0158 0159 H0252 (B2) × 2 × A EC252 P0150 0158 AF SENSOR1 (B1) × 2 × A EC261 P0150 0150 AF SENSOR1 (B2) × 2 × A EC261 P0150 0150 AF SENSOR1 (B2) × 2 × A EC261 P0161 0161 H0252 HTR (B2)	P0141	0141	HO2S2 HTR (B1)	_	2	×	В	EC-193
P014E 014E AF SENSOR1 (B2) × 2 × A EC281 P014F 014F AF SENSOR1 (B2) × 2 × A EC281 P0150 0150 AF SENSOR1 (B2) 2 × B EC283 P0151 0151 AF SENSOR1 (B2) 2 × B EC233 P0152 0152 AF SENSOR1 (B2) 2 × A EC233 P0150 0157 H0252 (B2) × 2 × A EC283 P0150 0158 H0252 (B2) × 2 × A EC281 P0150 0158 AF SENSOR1 (B1) × 2 × A EC281 P0150 0150 AF SENSOR1 (B2) × 2 × A EC281 P0150 0150 AF SENSOR1 (B2) × 2 × B EC281 P0150 0150 AF SENSOR1 (B2)	P014C	014C	A/F SENSOR1 (B1)	×	2	×	A	EC-261
P014F 014F AF SENSOR (B2) × 2 × A EC:281 P0150 0150 AF SENSOR1 (B2) 2 × A EC:223 P0151 0151 AF SENSOR1 (B2) 2 × B EC:233 P0152 0152 AF SENSOR1 (B2) 2 × A EC:233 P0157 0157 HO252 (B2) × 2 × A EC:232 P0158 0158 HO252 (B2) × 2 × A EC:252 P0150 0158 AF SENSOR1 (B1) × 2 × A EC:261 P0150 0150 AF SENSOR1 (B2) × 2 × A EC:261 P0150 0150 AF SENSOR1 (B2) × 2 × A EC:261 P0161 0161 HO252 HTR (B2) 2 × B EC:261 P0171 0171 FUEL SYS-RICH-B1	P014D	014D	A/F SENSOR1 (B1)	×	2	×	А	<u>EC-261</u>
P0150 0150 AF SENSOR (B2) 2 × A EC:229 P0151 0151 AF SENSOR1 (B2) 2 × B EC:233 P0152 0152 AF SENSOR1 (B2) 2 × B EC:239 P0156 0158 HO252 (B2) × 2 × A EC:232 P0158 0158 HO252 (B2) × 2 × A EC:232 P0150 0154 AF SENSOR1 (B1) × 2 × A EC:261 P0150 0150 AF SENSOR1 (B1) × 2 × A EC:261 P0150 0150 AF SENSOR1 (B2) × 2 × A EC:261 P0161 0161 HO252 HTR (B2) 2 × B EC:261 P0171 0171 FUEL SYS-RICH-B1 2 × B EC:271 P0172 0175 FUEL SYS-RICH-	P014E	014E	A/F SENSOR1 (B2)	×	2	×	А	EC-261
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	P014F	014F	A/F SENSOR1 (B2)	×	2	×	A	EC-261
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	P0150	0150	A/F SENSOR1 (B2)	_	2	×	A	EC-229
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	P0151	0151	A/F SENSOR1 (B2)	_	2	×	В	<u>EC-233</u>
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	P0152	0152	A/F SENSOR1 (B2)	_	2	×	В	EC-236
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	P0157	0157	HO2S2 (B2)	×	2	×	A	EC-239
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	P0158	0158	HO2S2 (B2)	×	2	×	Α	<u>EC-245</u>
P015B 015B AF SENSOR1 (B1) × 2 × A EC:261 P015C 015C A/F SENSOR1 (B2) × 2 × A EC:261 P015D 015D A/F SENSOR1 (B2) × 2 × A EC:261 P0161 0161 HO2S2 HTR (B2) 2 × B EC:261 P0171 0171 FUEL SYS-LEAN-B1 2 × B EC:267 P0172 0172 FUEL SYS-RICH-B1 2 × B EC:271 P0174 0175 FUEL SYS-RICH-B2 2 × B EC:271 P0181 0181 FTT SENSOR 2 × B EC:271 P0182 0182 FTT SEN/CIRCUIT 2 × B EC:281 P0196 0196 EOT SEN/CIRCUIT 2 × B EC:285 P0197 0197 EO	P0159	0159	HO2S2 (B2)	×	2	×	Α	EC-252
P015C 015C A/F SENSOR1 (B2) × 2 × A EC.261 P015D 015D A/F SENSOR1 (B2) × 2 × A EC.261 P0161 0161 H02S2 HTR (B2) 2 × B EC.261 P0171 0171 FUEL SYS-LEAN-B1 2 × B EC.267 P0172 0172 FUEL SYS-LEAN-B2 2 × B EC.271 P0174 0174 FUEL SYS-RICH-B2 2 × B EC.271 P0175 0175 FUEL SYS-RICH-B2 2 × B EC.271 P0174 0181 FTT SENSOR 2 × A and B EC.271 P0182 0182 FTT SEN/CIRCUIT 2 × B EC.273 P0193 0196 EOT SEN/CIRC 2 × B EC.281 P0197 0197 <	P015A	015A	A/F SENSOR1 (B1)	×	2	×	A	EC-261
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	P015B	015B	A/F SENSOR1 (B1)	×	2	×	Α	EC-261
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	P015C	015C	A/F SENSOR1 (B2)	×	2	×	Α	EC-261
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	P015D	015D	A/F SENSOR1 (B2)	×	2	×	Α	EC-261
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	P0161	0161	HO2S2 HTR (B2)		2	×	В	EC-193
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	P0171	0171	FUEL SYS-LEAN-B1	_	2	×	В	EC-267
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	P0172	0172	FUEL SYS-RICH-B1		2	×	В	EC-271
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	P0174	0174	FUEL SYS-LEAN-B2	_	2	×	В	EC-267
P0182 0182 FTT SEN/CIRCUIT — 2 × B EC:279 P0183 0183 FTT SEN/CIRCUIT — 2 × B EC:279 P0196 0196 EOT SENSOR — 2 × B EC:281 P0197 0197 EOT SENSOR — 2 × B EC:285 P0198 0198 EOT SEN/CIRC — 2 × B EC:285 P0222 0222 TP SEN 1/CIRC-B1 — 1 × B EC:287 P0233 0223 TP SEN 1/CIRC-B1 — 1 × B EC:287 P0300 0300 MULTI CYL MISFIRE — 1 or 2 × B EC:290 P0301 0301 CYL 1 MISFIRE — 1 or 2 × B EC:290 P0302 0302 CYL 2 MISFIRE — 1 or 2 × B EC:290 P0303 0303 CYL 3	P0175	0175	FUEL SYS-RICH-B2	_	2	×	В	EC-271
P0183 0183 FTT SEN/CIRCUIT — 2 × B EC-279 P0196 0196 EOT SENSOR — 2 × A and B EC-281 P0197 0197 EOT SEN/CIRC — 2 × B EC-285 P0198 0198 EOT SEN/CIRC — 2 × B EC-285 P0222 0222 TP SEN 1/CIRC-B1 — 1 × B EC-287 P0233 0223 TP SEN 1/CIRC-B1 — 1 × B EC-287 P0300 0300 MULTI CYL MISFIRE — 1 or 2 × B EC-290 P0301 0301 CYL 1 MISFIRE — 1 or 2 × B EC-290 P0302 0302 CYL 2 MISFIRE — 1 or 2 × B EC-290 P0303 0303 CYL 3 MISFIRE — 1 or 2 × B EC-290 P0304 0304	P0181	0181	FTT SENSOR		2	×	A and B	EC-31
P0196 0196 EOT SENSOR — 2 × A and B EC-281 P0197 0197 EOT SEN/CIRC — 2 × B EC-285 P0198 0198 EOT SEN/CIRC — 2 × B EC-285 P0222 0222 TP SEN 1/CIRC-B1 — 1 × B EC-287 P0223 0223 TP SEN 1/CIRC-B1 — 1 × B EC-287 P0300 0300 MULTI CYL MISFIRE — 1 or 2 × B EC-290 P0301 0301 CYL 1 MISFIRE — 1 or 2 × B EC-290 P0302 0302 CYL 2 MISFIRE — 1 or 2 × B EC-290 P0303 0303 CYL 3 MISFIRE — 1 or 2 × B EC-290 P0304 0304 CYL 4 MISFIRE — 1 or 2 × B EC-290 P0305 0305	P0182	0182	FTT SEN/CIRCUIT	_	2	×	В	EC-279
P0197 0197 EOT SEN/CIRC 2 × B EC-285 P0198 0198 EOT SEN/CIRC 2 × B EC-285 P0222 0222 TP SEN 1/CIRC-B1 1 × B EC-287 P0223 0223 TP SEN 1/CIRC-B1 1 × B EC-287 P0300 0300 MULTI CYL MISFIRE 1 or 2 × B EC-290 P0301 0301 CYL 1 MISFIRE 1 or 2 × B EC-290 P0302 0302 CYL 2 MISFIRE 1 or 2 × B EC-290 P0303 0303 CYL 3 MISFIRE 1 or 2 × B EC-290 P0304 0304 CYL 4 MISFIRE 1 or 2 × B EC-290 P0305 0305 CYL 5 MISFIRE 1 or 2 × B EC-290 P0306 03	P0183	0183	FTT SEN/CIRCUIT		2	×	В	<u>EC-279</u>
P0198 0198 EOT SEN/CIRC — 2 × B EC-285 P0222 0222 TP SEN 1/CIRC-B1 — 1 × B EC-287 P0223 0223 TP SEN 1/CIRC-B1 — 1 × B EC-287 P0200 0300 MULTI CYL MISFIRE — 1 × B EC-287 P0300 0300 MULTI CYL MISFIRE — 1 or 2 × B EC-290 P0301 0301 CYL 1 MISFIRE — 1 or 2 × B EC-290 P0302 0302 CYL 2 MISFIRE — 1 or 2 × B EC-290 P0303 0303 CYL 3 MISFIRE — 1 or 2 × B EC-290 P0304 0304 CYL 4 MISFIRE — 1 or 2 × B EC-290 P0305 0305 CYL 5 MISFIRE — 1 or 2 × B EC-290 P0306 0306 <td>P0196</td> <td>0196</td> <td>EOT SENSOR</td> <td></td> <td>2</td> <td>×</td> <td>A and B</td> <td>EC-281</td>	P0196	0196	EOT SENSOR		2	×	A and B	EC-281
P0222 0222 TP SEN 1/CIRC-B1 1 × B EC-287 P0223 0223 TP SEN 1/CIRC-B1 1 × B EC-287 P0300 0300 MULTI CYL MISFIRE 1 or 2 × B EC-290 P0301 0301 CYL 1 MISFIRE 1 or 2 × B EC-290 P0302 0302 CYL 2 MISFIRE 1 or 2 × B EC-290 P0303 0303 CYL 3 MISFIRE 1 or 2 × B EC-290 P0304 0304 CYL 4 MISFIRE 1 or 2 × B EC-290 P0305 0303 CYL 5 MISFIRE 1 or 2 × B EC-290 P0306 0306 CYL 6 MISFIRE 1 or 2 × B EC-290 P0305 0305 CYL 5 MISFIRE 1 or 2 × B EC-290 P0306	P0197	0197	EOT SEN/CIRC		2	×	В	EC-285
P0223 0223 TP SEN 1/CIRC-B1 — 1 × B EC-287 P0300 0300 MULTI CYL MISFIRE — 1 or 2 × B EC-290 P0301 0301 CYL 1 MISFIRE — 1 or 2 × B EC-290 P0302 0302 CYL 2 MISFIRE — 1 or 2 × B EC-290 P0303 0303 CYL 3 MISFIRE — 1 or 2 × B EC-290 P0304 0304 CYL 4 MISFIRE — 1 or 2 × B EC-290 P0305 0305 CYL 4 MISFIRE — 1 or 2 × B EC-290 P0306 0305 CYL 5 MISFIRE — 1 or 2 × B EC-290 P0306 0306 CYL 6 MISFIRE — 1 or 2 × B EC-290 P0327 0327 KNOCK SEN/CIRC-B1 — 2 — — EC-296 P0328 <td< td=""><td>P0198</td><td>0198</td><td>EOT SEN/CIRC</td><td>_</td><td>2</td><td>×</td><td>В</td><td>EC-285</td></td<>	P0198	0198	EOT SEN/CIRC	_	2	×	В	EC-285
P0300 0300 MULTI CYL MISFIRE — 1 or 2 × B EC-290 P0301 0301 CYL 1 MISFIRE — 1 or 2 × B EC-290 P0302 0302 CYL 2 MISFIRE — 1 or 2 × B EC-290 P0302 0302 CYL 2 MISFIRE — 1 or 2 × B EC-290 P0303 0303 CYL 3 MISFIRE — 1 or 2 × B EC-290 P0304 0304 CYL 4 MISFIRE — 1 or 2 × B EC-290 P0305 0305 CYL 5 MISFIRE — 1 or 2 × B EC-290 P0306 0306 CYL 6 MISFIRE — 1 or 2 × B EC-290 P0327 0327 KNOCK SEN/CIRC-B1 — 2 — — EC-296 P0328 0328 KNOCK SEN/CIRC-B2 — 2 — — EC-296 P0332 <t< td=""><td>P0222</td><td>0222</td><td>TP SEN 1/CIRC-B1</td><td>_</td><td>1</td><td>×</td><td>В</td><td><u>EC-287</u></td></t<>	P0222	0222	TP SEN 1/CIRC-B1	_	1	×	В	<u>EC-287</u>
P0301 0301 CYL 1 MISFIRE — 1 or 2 × B EC-290 P0302 0302 CYL 2 MISFIRE — 1 or 2 × B EC-290 P0303 0303 CYL 3 MISFIRE — 1 or 2 × B EC-290 P0303 0303 CYL 3 MISFIRE — 1 or 2 × B EC-290 P0304 0304 CYL 4 MISFIRE — 1 or 2 × B EC-290 P0305 0305 CYL 5 MISFIRE — 1 or 2 × B EC-290 P0306 0306 CYL 6 MISFIRE — 1 or 2 × B EC-290 P0327 0327 KNOCK SEN/CIRC-B1 — 2 — — EC-296 P0328 0328 KNOCK SEN/CIRC-B2 — 2 — — EC-296 P0332 0332 KNOCK SEN/CIRC-B2 — 2 — — EC-296	P0223	0223	TP SEN 1/CIRC-B1	_	1	×	В	<u>EC-287</u>
P0302 0302 CYL 2 MISFIRE — 1 or 2 × B EC-290 P0303 0303 CYL 3 MISFIRE — 1 or 2 × B EC-290 P0304 0304 CYL 4 MISFIRE — 1 or 2 × B EC-290 P0305 0305 CYL 5 MISFIRE — 1 or 2 × B EC-290 P0306 0306 CYL 6 MISFIRE — 1 or 2 × B EC-290 P0306 0306 CYL 6 MISFIRE — 1 or 2 × B EC-290 P0327 0327 KNOCK SEN/CIRC-B1 — 2 — — EC-296 P0328 0328 KNOCK SEN/CIRC-B1 — 2 — — EC-296 P0332 0332 KNOCK SEN/CIRC-B2 — 2 — — EC-296	P0300	0300	MULTI CYL MISFIRE	_	1 or 2	×	В	EC-290
P0303 0303 CYL 3 MISFIRE — 1 or 2 × B EC-290 P0304 0304 CYL 4 MISFIRE — 1 or 2 × B EC-290 P0305 0305 CYL 5 MISFIRE — 1 or 2 × B EC-290 P0306 0306 CYL 6 MISFIRE — 1 or 2 × B EC-290 P0306 0306 CYL 6 MISFIRE — 1 or 2 × B EC-290 P0327 0327 KNOCK SEN/CIRC-B1 — 2 — — EC-296 P0328 0328 KNOCK SEN/CIRC-B2 — 2 — — EC-296 P0332 0332 KNOCK SEN/CIRC-B2 — 2 — — EC-296	P0301	0301	CYL 1 MISFIRE	_	1 or 2	×	В	<u>EC-290</u>
P0304 0304 CYL 4 MISFIRE 1 or 2 × B EC-290 P0305 0305 CYL 5 MISFIRE 1 or 2 × B EC-290 P0306 0306 CYL 6 MISFIRE 1 or 2 × B EC-290 P0306 0306 CYL 6 MISFIRE 1 or 2 × B EC-290 P0327 0327 KNOCK SEN/CIRC-B1 2 EC-296 P0328 0328 KNOCK SEN/CIRC-B1 2 EC-296 P0332 0332 KNOCK SEN/CIRC-B2 2 EC-296	P0302	0302	CYL 2 MISFIRE	_	1 or 2	×	В	<u>EC-290</u>
P0305 0305 CYL 5 MISFIRE — 1 or 2 × B EC-290 P0306 0306 CYL 6 MISFIRE — 1 or 2 × B EC-290 P0327 0327 KNOCK SEN/CIRC-B1 — 2 — — EC-296 P0328 0328 KNOCK SEN/CIRC-B1 — 2 — — EC-296 P0332 0332 KNOCK SEN/CIRC-B2 — 2 — — EC-296	P0303	0303	CYL 3 MISFIRE		1 or 2	×	В	<u>EC-290</u>
P0306 0306 CYL 6 MISFIRE — 1 or 2 × B EC-290 P0327 0327 KNOCK SEN/CIRC-B1 — 2 — — EC-296 P0328 0328 KNOCK SEN/CIRC-B1 — 2 — — EC-296 P0332 0332 KNOCK SEN/CIRC-B2 — 2 — — EC-296	P0304	0304	CYL 4 MISFIRE		1 or 2	×	В	<u>EC-290</u>
P0327 0327 KNOCK SEN/CIRC-B1 — 2 — — EC-296 P0328 0328 KNOCK SEN/CIRC-B1 — 2 — — EC-296 P0332 0332 KNOCK SEN/CIRC-B2 — 2 — — EC-296	P0305	0305	CYL 5 MISFIRE	_	1 or 2	×	В	<u>EC-290</u>
P0328 0328 KNOCK SEN/CIRC-B1 — 2 — — EC-296 P0332 0332 KNOCK SEN/CIRC-B2 — 2 — — EC-296	P0306	0306	CYL 6 MISFIRE	_	1 or 2	×	В	EC-290
P0332 0332 KNOCK SEN/CIRC-B2 — 2 — — EC-296	P0327	0327	KNOCK SEN/CIRC-B1	_	2	_	_	<u>EC-296</u>
	P0328	0328	KNOCK SEN/CIRC-B1	_	2	_	_	<u>EC-296</u>
P0333 0333 KNOCK SEN/CIRC-B2 — 2 — — <u>EC-296</u>	P0332	0332	KNOCK SEN/CIRC-B2	_	2	—	—	<u>EC-296</u>
	P0333	0333	KNOCK SEN/CIRC-B2	—	2		-	<u>EC-296</u>

< ECU DIAGNOSIS INFORMATION >

[VQ35DE]

Density Items SRT Trip MIL Permanent Refer- DTC group ⁴ A P0350 0355 CKP SEN/CIRC-B1 - 2 × B EC.201 P0345 0340 CMP SEN/CIRC-B1 - 2 × B EC.201 P0345 0345 CMP SEN/CIRC-B1 - 2 × A EC.201 P0420 0420 TW CATLYST SYS-B1 × 2 × A EC.205 P0430 0430 TW CATLYST SYS-B2 × 2 × A EC.205 P0441 0441 EVAP PURG FLOWIMON × 2 × A EC.202 P0443 0443 PURG VOLUME CONTV - 2 × B EC.202 P0444 0449 VENT CONTROL VALVE - 2 × B EC.202 P0443 0449 VENT SYS PRES SEN - 2 × A EC.204 P0444 <td< th=""><th colspan="2">DTC^{*1}</th><th>li a ma</th><th colspan="2">CDT</th><th></th><th>Permanent</th><th>Refer-</th><th>А</th></td<>	DTC ^{*1}		li a ma	CDT			Permanent	Refer-	А
P0340 0340 CMP SENCIRC-B1 2 × B EC-301 P0420 0420 TW CATALYST SYS-B1 × 2 × A EC-305 C P0420 0430 TW CATALYST SYS-B1 × 2 × A EC-305 C P0441 0441 EVAP PURG FLOWMON × 2 × A EC-320 D P0443 0443 PURG VOLUME CONT/V - 2 × B EC-320 D P0444 0444 PURG VOLUME CONT/V - 2 × B EC-320 E P0445 0445 PURG VOLUME CONT/V - 2 × B EC-320 E P04461 0447 VENT CONTROL VALVE - 2 × B EC-337 G P0451 0451 EVAP SYS PRES SEN - 2 × B EC-337 G P0452 0456 EVAP VERY SNLEAK		ECM ^{*3}			Trip	MIL			A
P0345 0345 CMP SENCIRC-B2 2 × B EC.301 C P0420 0420 TW GATALYST SYS-B1 × 2 × A EC.305 C P0430 0430 TW GATALYST SYS-B2 × 2 × A EC.305 P0441 0441 EVAP PURG FLOWIMON × 2 × A EC.320 P0443 0443 PURG VOLUME CONT/V 2 × B EC.320 P0444 0444 PURG VOLUME CONT/V 2 × B EC.320 P0447 0447 VENT CONTROL VALVE 2 × B EC.322 P0451 0451 EVAP SYS PRES SEN 2 × A EC.321 P0452 0452 EVAP SYS PRES SEN 2 × B EC.332 P0456 0468 EVAP SYS PRES SEN 2 × B EC.341 <	P0335	0335	CKP SEN/CIRCUIT	_	2	×	В	<u>EC-298</u>	EC
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	P0340	0340	CMP SEN/CIRC-B1	_	2	×	В	<u>EC-301</u>	
P0430 0430 110 CATALTS STS-B2 x 2 x A EC300 P0430 0433 PUK CATALTS SYS-B2 x 2 x A EC300 P0441 0441 EVAP PURG FLOW/MON x 2 x A EC300 P0443 0443 PURG VOLUME CONT/V 2 x B EC320 E P0444 0444 PURG VOLUME CONT/V 2 x B EC320 E P0447 0447 VENT CONTROL VALVE 2 x A EC28 P0443 0448 VENT CONTROL VALVE 2 x A EC327 P0451 0453 EVAP SYS PRES SEN 2 x B EC3334 P0452 0453 EVAP SYS PRES SEN 2 x B EC3324 P0464 0460 FUEL LEV SENCIRC 2 x B EC3439	P0345	0345	CMP SEN/CIRC-B2		2	×	В	<u>EC-301</u>	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	P0420	0420	TW CATALYST SYS-B1	×	2	×	A	<u>EC-305</u>	С
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	P0430	0430	TW CATALYST SYS-B2	×	2	×	A	<u>EC-305</u>	
P0444 0444 PURG VOLUME CONT/V 2 × B EC-320 P0445 0445 PURG VOLUME CONT/V 2 × B EC-320 P0448 04447 VENT CONTROL VALVE 2 × B EC-327 P0448 0445 VENT CONTROL VALVE 2 × B EC-327 P0451 0451 EVAP SYS PRES SEN 2 × A EC-324 P0452 0452 EVAP SYS PRES SEN 2 × A EC-334 P0450 0456 EVAP VERY SML LEAK × ⁷ 2 × A EC-341 P0461 0461 FUEL LEV SENCIRC 2 × B EC-350 P0462 0463 FUEL LEV SENCIRC 2 × B EC-351 P0461 0463 FUEL LEV SENCIRC 2 × B EC-355 P0507	P0441	0441	EVAP PURG FLOW/MON	×	2	×	A	<u>EC-310</u>	D
P0445 0445 PURG VOLUME CONT/V 2 × B EC.320 F P0447 0447 VENT CONTROL VALVE 2 × B EC.327 P0448 0444 VENT CONTROL VALVE 2 × B EC.327 P0451 0451 EVAP SYS PRES SEN 2 × A EC.327 P0452 0452 EVAP SYS PRES SEN 2 × B EC.334 P0460 0465 EVAP SYS PRES SEN 2 × A EC.341 P0461 0461 FUEL LEV SEN SLOSH - 2 × B EC.3351 P0461 0463 FUEL LEV SENCIRC - 2 × B EC.351 P0462 0463 FUEL LEV SENCIRC - 2 × B EC.351 P0500 0500 VEN SPEED SENCIRC ¹⁰ - 2 × B EC.355 P	P0443	0443	PURG VOLUME CONT/V	_	2	×	A	<u>EC-29</u>	
P0447 0447 VENT CONTROL VALVE - 2 × B EC.29 P0448 0448 VENT CONTROL VALVE - 2 × B EC.327 P0451 0451 EVAP SYS PRES SEN - 2 × A EC.29 P0452 0452 EVAP SYS PRES SEN - 2 × B EC.337 P0453 0453 EVAP SYS PRES SEN - 2 × A EC.341 P0456 0456 EVAP VERY SML LEAK ×'7 2 × A EC.341 P0460 0460 FUEL LEV SEN SLOCH - 2 × B EC.350 P0461 0463 FUEL LEV SEN/CIRC - 2 × B EC.351 P0463 0463 FUEL LEV SEN/CIRC - 2 × B EC.351 P0506 05060 ISC SYSTEM - 2 × A EC.352 P05020 0524	P0444	0444	PURG VOLUME CONT/V		2	×	В	<u>EC-320</u>	
P0448 0448 VENT CONTROL VALVE 2 × B EC:327 F P0451 0451 EVAP SYS PRES SEN 2 × A EC:22 F P0452 0452 EVAP SYS PRES SEN 2 × B EC:337 G P0450 0456 EVAP SYS PRES SEN 2 × B EC:337 G P0460 0460 FUEL LEV SEN SLOSH 2 × A EC:341 P0461 0461 FUEL LEV SENCIRC 2 × B EC:350 I P0462 0462 FUEL LEV SENCIRC 2 × B EC:351 P0500 0500 VEH SPEED SENCIRC ⁶ 2 × B EC:353 P0507 0507 ISC SYSTEM 2 × A EC:357 P0504 0502 EOSE COLD START CONTROL 2 ×	P0445	0445	PURG VOLUME CONT/V	_	2	×	В	<u>EC-320</u>	E
P0451 0451 EVAP SYS PRES SEN - 2 × A EC.29 F P0452 0452 EVAP SYS PRES SEN - 2 × B EC.334 G P0453 0453 EVAP SYS PRES SEN - 2 × B EC.337 G P0456 0456 EVAP VERY SML LEAK ×'' 2 × A EC.341 P0460 0460 FUEL LEV SINSOR - 2 × B EC.348 P0461 0461 FUEL LEVL SENSOR - 2 × B EC.350 P0462 0462 FUEL LEVL SENCIRC - 2 × B EC.350 I P0500 0500 VEH SPEED SEN/CIRC ⁶ - 2 × B EC.351 J P0500 0507 ISC SYSTEM - 2 × A EC.352 P0504 0504 COLD START CONTROL - 2 × A </td <td>P0447</td> <td>0447</td> <td>VENT CONTROL VALVE</td> <td></td> <td>2</td> <td>×</td> <td>В</td> <td><u>EC-29</u></td> <td></td>	P0447	0447	VENT CONTROL VALVE		2	×	В	<u>EC-29</u>	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	P0448	0448	VENT CONTROL VALVE		2	×	В	<u>EC-327</u>	_
P0453 0453 EVAP SYS PRES SEN 2 × B EC.337 G P0456 0456 EVAP VERY SML LEAK ×'7 2 × A EC.337 H P0460 0460 FUEL LEV SEN SLOSH 2 × A EC.341 H P0461 0461 FUEL LEV SEN SLOSH 2 × B EC.3427 H P0462 0462 FUEL LEVL SEN/CIRC 2 × B EC.350 I P0463 0463 FUEL LEVL SEN/CIRC 2 × B EC.351 P0500 0500 VEH SPEED SEN/CIRC*6 2 × B EC.355 P0507 0507 ISC SYSTEM 2 × A EC.357 P0506 0506 COLD START CONTROL 2 × A EC.365 P0520 0524 ENGINE OIL PRESSURE 1 <	P0451	0451	EVAP SYS PRES SEN	_	2	×	A	<u>EC-29</u>	I
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	P0452	0452	EVAP SYS PRES SEN	_	2	×	В	<u>EC-334</u>	
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	P0453	0453	EVAP SYS PRES SEN	_	2	×	В	EC-337	G
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	P0456	0456	EVAP VERY SML LEAK	×*7	2	×	A	<u>EC-341</u>	
P0461 0461 FUEL LEVEL SENSOR 2 \times B EC.348 P0462 0462 FUEL LEVL SENCIRC 2 \times B EC.350 P0463 0463 FUEL LEVL SENCIRC 2 \times B EC.350 P0500 0500 VEH SPEED SEN/CIRC ⁶ 2 \times B EC.351 P0500 0506 ISC SYSTEM 2 \times B EC.353 P0507 0507 ISC SYSTEM 2 \times A EC.357 P0506 0506 COLD START CONTROL 2 \times A EC.357 P0502 0520 EOP SENSOR/SWITCH 2 \times A EC.357 P0524 0524 ENGINE OIL PRESSURE 1 - EC.365 P0526 052C CAMSHAFT POSITION TIM- ING B1 - 2 \times B EC.365 <td< td=""><td>P0460</td><td>0460</td><td>FUEL LEV SEN SLOSH</td><td>_</td><td>2</td><td>×</td><td>А</td><td><u>EC-347</u></td><td>н</td></td<>	P0460	0460	FUEL LEV SEN SLOSH	_	2	×	А	<u>EC-347</u>	н
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	P0461	0461	FUEL LEVEL SENSOR	_	2	×	В	<u>EC-348</u>	11
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	P0462	0462	FUEL LEVL SEN/CIRC	_	2	×	В	<u>EC-350</u>	
P0506 0506 ISC SYSTEM - 2 × B EC-353 J P0507 0507 ISC SYSTEM - 2 × B EC-355 J P0500 0504 COLD START CONTROL - 2 × A EC-357 K P0500 0502 COLD START CONTROL - 2 × A EC-357 K P0520 0520 EOP SENSOR/SWITCH - 2 - - EC-362 L P0524 0524 ENGINE OIL PRESSURE - 1 - - EC-365 L P0528 0528 CAMSHAFT POSITION TIM- ING B1 - 2 × B EC-365 M P0520 0520 CAMSHAFT POSITION TIM- ING B2 - 2 × B EC-365 M P0520 0520 CAMSHAFT POSITION TIM- ING B2 - 2 × B EC-365 M P0603 0603	P0463	0463	FUEL LEVL SEN/CIRC	_	2	×	В	<u>EC-350</u>	
P0507 0507 ISC SYSTEM - 2 × B EC.355 P050A 050A COLD START CONTROL - 2 × A EC.357 P050E 050E COLD START CONTROL - 2 × A EC.357 P050E 050E COLD START CONTROL - 2 × A EC.357 P0520 0520 EOP SENSOR/SWITCH - 2 - - EC.362 P0524 0524 ENGINE OIL PRESSURE - 1 - - EC.365 P0520 052A CAMSHAFT POSITION TIM- ING B1 - 2 × B EC.365 M P052D 052D CAMSHAFT POSITION TIM- ING B2 - 2 × B EC.365 M P052D 052D CAMSHAFT POSITION TIM- ING B2 - 2 × B EC.365 N P0603 0603 ECM BACK UP/CIRCUIT ^{*10} - 2 × or	P0500	0500	VEH SPEED SEN/CIRC*6	_	2	×	В	EC-351	
P050A 050A COLD START CONTROL 2 × A EC-357 P050E 050E COLD START CONTROL 2 × A EC-357 P0520 0520 EOP SENSOR/SWITCH 2 EC-359 P0524 0524 ENGINE OIL PRESSURE 1 EC-362 L P0528 0528 CAMSHAFT POSITION TIM- ING B1 2 × B EC-365 M P0520 0520 CAMSHAFT POSITION TIM- ING B2 - 2 × B EC-365 M P0520 0520 CAMSHAFT POSITION TIM- ING B2 - 2 × B EC-365 M P0520 0520 CAMSHAFT POSITION TIM- ING B2 - 2 × B EC-365 N P0603 0603 ECM BACK UP/CIRCUIT*10 2 × or B EC-371 O P0605 0605	P0506	0506	ISC SYSTEM		2	×	В	EC-353	
P050E 050E COLD START CONTROL 2 × A EC-357 K P0520 0520 EOP SENSOR/SWITCH 2 EC-357 L P0524 0524 ENGINE OIL PRESSURE 1 EC-362 L P0524 052A CAMSHAFT POSITION TIM- ING B1 2 × B EC-365 M P052B 052B CAMSHAFT POSITION TIM- ING B2 - 2 × B EC-365 M P052C 052C CAMSHAFT POSITION TIM- ING B2 - 2 × B EC-365 M P052D 052D CAMSHAFT POSITION TIM- ING B2 - 2 × B EC-365 M P052D 052D CAMSHAFT POSITION TIM- ING B2 - 2 × B EC-365 M P0603 0603 ECM - 1 × B EC-371 O P060	P0507	0507	ISC SYSTEM	_	2	×	В	<u>EC-355</u>	J
P0520 0520 EOP SENSOR/SWITCH - 2 - - EC-359 P0524 0524 ENGINE OIL PRESSURE - 1 - - EC-362 L P0524 0524 ENGINE OIL PRESSURE - 1 - - EC-362 L P0528 0528 CAMSHAFT POSITION TIM- ING B1 - 2 × B EC-365 M P052C 052C CAMSHAFT POSITION TIM- ING B2 - 2 × B EC-365 M P052D 052D CAMSHAFT POSITION TIM- ING B2 - 2 × B EC-365 M P052D 052D CAMSHAFT POSITION TIM- ING B2 - 2 × B EC-365 M P0603 0603 ECM BACK UP/CIRCUIT ¹⁰ - 2 × or - B EC-371 O P0604 0604 ECM - 1 × or - B EC-374 P P0605 060	P050A	050A	COLD START CONTROL	_	2	×	А	<u>EC-357</u>	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	P050E	050E	COLD START CONTROL	_	2	×	А	<u>EC-357</u>	Κ
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	P0520	0520	EOP SENSOR/SWITCH	_	2	_	—	<u>EC-359</u>	
P052A 052A ING B1 - 2 × B EC-365 P052B 052B CAMSHAFT POSITION TIM- ING B1 - 2 × B EC-365 M P052C 052C CAMSHAFT POSITION TIM- ING B2 - 2 × B EC-365 M P052D 052D CAMSHAFT POSITION TIM- ING B2 - 2 × B EC-365 N P052D 052D CAMSHAFT POSITION TIM- ING B2 - 2 × B EC-365 N P052D 052D CAMSHAFT POSITION TIM- ING B2 - 2 × B EC-365 N P0603 0603 ECM BACK UP/CIRCUIT*10 - 2 × or - B EC-371 O P0604 0604 ECM - 1 × or - B EC-374 P P0606 0606 CONTROL MODULE - 1 or 2 × or - B EC-376 P P0607	P0524	0524	ENGINE OIL PRESSURE	_	1	—	_	EC-362	1
P052B 052B ING B1 - 2 × B EC-365 M P052C 052C CAMSHAFT POSITION TIM- ING B2 - 2 × B EC-365 N P052D 052D CAMSHAFT POSITION TIM- ING B2 - 2 × B EC-365 N P0603 0603 ECM BACK UP/CIRCUIT* ¹⁰ - 2 × B EC-371 O P0604 0604 ECM - 1 × B EC-374 O P0605 0605 ECM - 1 × or - B EC-374 P P0606 0606 CONTROL MODULE - 1 or 2 × or - B EC-375 P P0607 0607 ECM - 1 or 2 × or - B EC-376 P0608 060A CONTROL MODULE - 1 × B EC-378 P062F 062F CONTROL MODULE - 1	P052A	052A		_	2	×	В	<u>EC-365</u>	L
P052C 052C ING B2 - 2 × B EC-365 N P052D 052D CAMSHAFT POSITION TIM- ING B2 - 2 × B EC-365 N P0603 0603 ECM BACK UP/CIRCUIT ^{*10} - 2 × or B EC-371 O P0604 0604 ECM 1 × B EC-373 O P0605 0605 ECM 1 × or B EC-374 P P0606 0606 CONTROL MODULE 1 or 2 × or B EC-375 P P0607 0607 ECM 1 or 2 × or B EC-376 P P0607 0607 ECM 1 or 2 × or B EC-376 P P0608 0608 CONTROL MODULE 1 × B EC-378 P062F 062F CONTROL MODULE <td>P052B</td> <td>052B</td> <td></td> <td>_</td> <td>2</td> <td>×</td> <td>В</td> <td><u>EC-365</u></td> <td>Μ</td>	P052B	052B		_	2	×	В	<u>EC-365</u>	Μ
P052D 052D CAMISHAF POSITION TIME ING B2 - 2 × B EC-365 P0603 0603 ECM BACK UP/CIRCUIT ^{*10} - 2 × or B EC-371 - P0604 0604 ECM 1 × B EC-373 - P0605 0605 ECM 1 × or B EC-374 - P0606 0606 CONTROL MODULE 1 × or B EC-375 P P0607 0607 ECM 1 or 2 × or B EC-376 P0608 060A CONTROL MODULE 1 or 2 × or B EC-377 P0608 060B CONTROL MODULE 1 × B EC-378 P062F 062F CONTROL MODULE 1 × B EC-371	P052C	052C		_	2	×	В	<u>EC-365</u>	
P0604 0604 ECM — 1 × B EC-373 P0605 0605 ECM — 1 × or — B EC-374 P0606 0606 CONTROL MODULE — 1 × or — B EC-375 P0607 0607 ECM — 1 or 2 × or — B EC-376 P0608 060A CONTROL MODULE — 1 or 2 × or — B EC-376 P0608 060A CONTROL MODULE — 1 × B EC-378 P0608 060B CONTROL MODULE — 1 × B EC-378 P062F 062F CONTROL MODULE — 1 × B EC-371	P052D	052D		_	2	×	В	<u>EC-365</u>	N
P0604 0604 ECM — 1 × B EC-373 P0605 0605 ECM — 1 × or — B EC-374 P0606 0606 CONTROL MODULE — 1 × or — B EC-375 P0607 0607 ECM — 1 or 2 × or — B EC-376 P060A 060A CONTROL MODULE — 1 or 2 × or — B EC-377 P060B 060B CONTROL MODULE — 1 × B EC-378 P060B 060B CONTROL MODULE — 1 × B EC-378 P062F 062F CONTROL MODULE — 1 × B EC-371	P0603	0603	ECM BACK UP/CIRCUIT ^{*10}	_	2	× or —	В	<u>EC-371</u>	\bigcirc
P0606 0606 CONTROL MODULE — 1 × or — B EC-375 P0607 0607 ECM — 1 or 2 × or — B EC-376 P060A 060A CONTROL MODULE — 1 × B EC-377 P060B 060B CONTROL MODULE — 1 × B EC-378 P062F 062F CONTROL MODULE — 1 × B EC-371	P0604	0604	ECM		1	×	В	<u>EC-373</u>	0
P0607 0607 ECM 1 or 2 × or B EC-376 P060A 060A CONTROL MODULE 1 × B EC-377 P060B 060B CONTROL MODULE 1 × B EC-378 P062F 062F CONTROL MODULE 1 × B EC-371	P0605	0605	ECM		1	× or —	В	<u>EC-374</u>	
P060A 060A CONTROL MODULE — 1 × B EC-377 P060B 060B CONTROL MODULE — 1 × B EC-378 P062F 062F CONTROL MODULE — 1 × B EC-371	P0606	0606	CONTROL MODULE	_	1	× or —	В	<u>EC-375</u>	Ρ
P060B 060B CONTROL MODULE — 1 × B EC-378 P062F 062F CONTROL MODULE — 1 × B EC-371	P0607	0607	ECM		1 or 2	× or —	В	EC-376	
P062F 062F CONTROL MODULE — 1 × B EC-371	P060A	060A	CONTROL MODULE	_	1	×	В	<u>EC-377</u>	
	P060B	060B	CONTROL MODULE	_	1	×	В	<u>EC-378</u>	
P0643 0643 SENSOR POWER/CIRC — 1 × B EC-379	P062F	062F	CONTROL MODULE	_	1	×	В	<u>EC-371</u>	
	P0643	0643	SENSOR POWER/CIRC		1	×	В	<u>EC-379</u>	

< ECU DIAGNOSIS INFORMATION >

DT	C ^{*1}	llarea	0.07			Permanent	D. (
CONSULT GST ^{*2}	ECM ^{*3}	Items (CONSULT screen terms)	SRT code	Trip	MIL	DTC group ^{*4}	Refer- ence page	
P0850	0850	P-N POS SW/CIRCUIT	_	2	×	В	<u>EC-381</u>	
P1078	1078	EXH TIM SEN/CIRC-B1	_	2	×	В	<u>EC-384</u>	
P1084	1084	EXH TIM SEN/CIRC-B2	_	2	×	В	<u>EC-384</u>	
P1148	1148	CLOSED LOOP-B1	_	1	×	А	<u>EC-388</u>	
P1168	1168	CLOSED LOOP-B2		1	×	А	EC-388	
P1212	1212	TCS/CIRC	_	2		_	<u>EC-389</u>	
P1217	1217	ENG OVER TEMP	_	1	×	В	<u>EC-390</u>	
P1225	1225	CTP LEARNING-B1		2	—	—	EC-394	
P1226	1226	CTP LEARNING-B1	_	2	_	_	<u>EC-395</u>	
P1550	1550	BAT CURRENT SENSOR		2	_	_	EC-396	
P1551	1551	BAT CURRENT SENSOR		2	_	_	EC-399	
P1552	1552	BAT CURRENT SENSOR		2		_	EC-399	
P1553	1553	BAT CURRENT SENSOR		2	_	_	<u>EC-402</u>	
P1554	1554	BAT CURRENT SENSOR		2	—	—	EC-405	
P1556	1556	BAT TMP SEN/CIRC	_	2		_	<u>EC-408</u>	
P1557	1557	BAT TMP SEN/CIRC		2		_	<u>EC-408</u>	
P1564	1564	ASCD SW	_	1		_	<u>EC-410</u>	
P1572	1572	ASCD BRAKE SW	_	1		_	<u>EC-413</u>	
P1574	1574	ASCD VHL SPD SEN		1		_	<u>EC-419</u>	
P1610	1610	LOCK MODE	_	2		_	<u>SEC-62</u>	
P1611	1611	ID DISCORD, IMM-ECM	_	2		_	<u>SEC-63</u>	
P1612	1612	CHAIN OF ECM-IMMU	_	2	_	_	<u>SEC-64</u>	
P1650	1650	STR MTR RELAY2		2	× or —	В	<u>EC-421</u>	
P1651	1651	STR MTR RELAY	_	2	× or —	В	<u>EC-424</u>	
P1652	1652	STR MTR SYS COMM	_	1	×	В	<u>EC-427</u>	
P1715	1715	IN PULY SPEED		2		_	<u>EC-430</u>	
P1800	1800	VIAS S/V-1	_	2		_	<u>EC-431</u>	
P1801	1801	VIAS S/V-2	_	2		_	<u>EC-27</u>	
P1805	1805	BRAKE SW/CIRCUIT	_	2	_	_	<u>EC-435</u>	
P2096	2096	A/F SENSOR1 (B1)		2	×	А	<u>EC-437</u>	
P2097	2097	A/F SENSOR1 (B1)		2	×	А	<u>EC-437</u>	
P2098	2098	A/F SENSOR1 (B2)		2	×	А	EC-437	
P2099	2099	A/F SENSOR1 (B2)		2	×	А	EC-437	
P2100	2100	ETC MOT PWR-B1	_	1	×	В	<u>EC-441</u>	
P2101	2101	ETC FNCTN/CIRC-B1		1	×	В	<u>EC-443</u>	
P2103	2103	ETC MOT PWR		1	×	В	EC-441	
P2118	2118	ETC MOT-B1	—	1	×	В	<u>EC-446</u>	
P2119	2119	ETC ACTR-B1	—	1	×	В	<u>EC-448</u>	
P2122	2122	APP SEN 1/CIRC	—	1	×	В	<u>EC-450</u>	
P2123	2123	APP SEN 1/CIRC	—	1	×	В	<u>EC-450</u>	
P2127	2127	APP SEN 2/CIRC	—	1	×	В	<u>EC-452</u>	
P2128	2128	APP SEN 2/CIRC		1	×	В	<u>EC-452</u>	

< ECU DIAGNOSIS INFORMATION >

DT	C ^{*1}	Items	SRT			Permanent	Refer-	А
CONSULT GST ^{*2}	ECM ^{*3}	(CONSULT screen terms)	code	Trip	MIL	DTC group ^{*4}		
P2135	2135	TP SENSOR-B1	—	1	×	В	<u>EC-455</u>	EC
P2138	2138	APP SENSOR	_	1	×	В	<u>EC-457</u>	
P219A	219A	AIR FUEL RATIO IMBAL- ANCE B1	_	2	×	A	<u>EC-460</u>	С
P219B	219B	AIR FUEL RATIO IMBAL- ANCE B2	_	2	×	A	<u>EC-460</u>	
P2610	2610	ECM/PCM INTERNAL ENG OFF TIMER	_	2	×	A and B	<u>EC-465</u>	D
*1: 1 of trip DTC N	la is the same (

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

*2: This number is prescribed by SAE J2012/ISO 15031-6.

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

*4: Refer to EC-161, "Description", "HOW TO ERASE PERMANENT DTC".

*5: The troubleshooting for this DTC needs CONSULT.

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

*7: SRT code will not be set if the self-diagnostic result is NG.

*8: When the ECM is in the mode displays SRT status, MIL may blink. For the details, refer to "How to Display SRT Status".

*9: When erasing this DTC, always use CONSULT or GST.

*10: This self-diagnosis is not for ECM power supply circuit, even though "ECM BACK UP/CIRCUIT" is displayed on CONSULT screen.

Test Value and Test Limit

The following is the information specified in Service \$06 of SAE J1979/ISO 15031-5.

The test value is a parameter used to determine whether a system/circuit diagnostic test is OK or NG while being monitored by the ECM during self-diagnosis. The test limit is a reference value which is specified as the maximum or minimum value and is compared with the test value being monitored.

These data (test value and test limit) are specified by On Board Monitor ID (OBDMID), Test ID (TID), Unit and Scaling ID and can be displayed on the GST screen.

The items of the test value and test limit will be displayed with GST screen which items are provided by the ECM. (e.g., if bank 2 is not applied on this vehicle, only the items of bank 1 are displayed)

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INFOID:000000013053829

< ECU DIAGNOSIS INFORMATION >

Item	OBD-	Self-diagnostic test item	DTC	lii	e and Test mit display)	Description
	MID			TID	Unitand Scaling ID	Decompaint
			P0131	83H	0BH	Minimum sensor output voltage for test cycle
			P0131	84H	0BH	Maximum sensor output voltage for test cycle
			P0130	85H	0BH	Minimum sensor output voltage for test cycle
			P0130	86H	0BH	Maximum sensor output voltage for test cycle
			P0133	87H	04H	Response rate: Response ratio (lean to rich)
			P0133	88H	04H	Response rate: Response ratio (rich to lean)
			P2A00 or P2096	89H	84H	The amount of shift in air fuel ratio (too lean)
			P2A00 or P2097	8AH	84H	The amount of shift in air fuel ratio (too rich)
			P0130	8BH	0BH	Difference in sensor output voltage
			P0133	8CH	83H	Response gain at the limited frequency
HO2S	01H	Air fuel ratio (A/F) sensor 1 (Bank 1)	P014C	8DH	04H	O2 sensor slow response - Rich to lean bank 1 sensor 1
			P014C	8EH	04H	O2 sensor slow response - Rich to lean bank 1 sensor 1
			P014D	8FH	84H	O2 sensor slow response - Lean to rich bank 1 sensor 1
			P014D	90H	84H	O2 sensor slow response - Lean to rich bank 1 sensor 1
			P015A	91H	01H	O2 sensor delayed response - Rich to lean bank 1 sensor 1
			P015A	92H	01H	O2 sensor delayed response - Rich to lean bank 1 sensor 1
			P015B	93H	01H	O2 sensor delayed response - Lean to rich bank 1 sensor 1
		-	P015B	94H	01H	O2 sensor delayed response - Lean to rich bank 1 sensor 1
			P0133	95H	04H	Response rate: Response ratio (lean to rich)
			P0133	96H	84H	Response rate: Response ratio (rich to lean)

< ECU DIAGNOSIS INFORMATION >

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Item	OBD-	Self-diagnostic test item	DTC	(GST	display)	Description	
	MID			TID	Unitand Scaling ID		ł
			P0138	07H	0CH	Minimum sensor output voltage for test cycle	-
		Heated oxygen sensor 2	P0137	08H	0CH	Maximum sensor output voltage for test cycle	-
	02H	(Bank 1)	P0138	80H	0CH	Sensor output voltage	_
			P0139	81H	0CH	Difference in sensor output voltage	_
			P0139	82H	11H	Rear O2 sensor delay response diag- nosis	
			P0143	07H	0CH	Minimum sensor output voltage for test cycle	_
	03H	Heated oxygen sensor 3 (Bank 1)	P0144	08H	0CH	Maximum sensor output voltage for test cycle	-
HO2S			P0146	80H	0CH	Sensor output voltage	-
			P0145	81H	0CH	Difference in sensor output voltage	-
		H Air fuel ratio (A/F) sensor 1 (Bank 2)	P0151	83H	0BH	Minimum sensor output voltage for test cycle	=
			P0151	84H	0BH	Maximum sensor output voltage for test cycle	-
			P0150	85H	0BH	Minimum sensor output voltage for test cycle	-
			P0150	86H	0BH	Maximum sensor output voltage for test cycle	-
			P0153	87H	04H	Response rate: Response ratio (lean to rich)	-
			P0153	88H	04H	Response rate: Response ratio (rich to lean)	-
			P2A03 or P2098	89H	84H	The amount of shift in air fuel ratio (too lean)	-
			P2A03 or P2099	8AH	84H	The amount of shift in air fuel ratio (too rich)	-
	05H		P0150	8BH	0BH	Difference in sensor output voltage	-
			P0153	8CH	83H	Response gain at the limited frequency	_
			P014E	8DH	04H	O2 sensor slow response - Rich to lean bank 2 sensor 1	_
		P014E	8EH	04H	O2 sensor slow response - Rich to lean bank 2 sensor 1	-	
			P014F	8FH	84H	O2 sensor slow response - Lean to rich bank 2 sensor 1	-
			P014F	90H	84H	O2 sensor slow response - Lean to rich bank 2 sensor 1	-
			P015C	91H	01H	O2 sensor delayed response - Rich to lean bank 2 sensor 1	-
			P015C	92H	01H	O2 sensor delayed response - Rich to lean bank 2 sensor 1	-
			P015D	93H	01H	O2 sensor delayed response - Lean to rich bank 2 sensor 1	-

< ECU DIAGNOSIS INFORMATION >

	OBD-			li	e and Test mit display)		
Item	MID	Self-diagnostic test item	DTC	TID	Unitand Scaling ID	Description	
			P015D	94H	01H	O2 sensor delayed response - Lean to rich bank 2 sensor 1	
	05H	Air fuel ratio (A/F) sensor 1 (Bank 2)	P0153	95H	04H	Response rate: Response ratio (lean to rich)	
			P0153	96H	84H	Response rate: Response ratio (rich to lean)	
			P0158	07H	0CH	Minimum sensor output voltage for test cycle	
		Heated oxygen sensor 2	P0157	08H	0CH	Maximum sensor output voltage for test cycle	
HO2S	06H	(Bank 2)	P0158	80H	0CH	Sensor output voltage	
			P0159	81H	0CH	Difference in sensor output voltage	
			P0159	82H	11H	Rear O2 sensor delay response diag- nosis	
07H			P0163	07H	0CH	Minimum sensor output voltage for test cycle	
	07H	Heated oxygen sensor 3 (Bank2)	P0164	08H	0CH	Maximum sensor output voltage for test cycle	
		P0166	80H	0CH	Sensor output voltage		
		P0165	81H	0CH	Difference in sensor output voltage		
CATA-		Three way catalyst function (Bank1)	P0420	80H	01H	O2 storage index	
	21H		P0420	82H	01H	Switching time lag engine exhaust in- dex value	
	2111		P2423	83H	0CH	Difference in 3rd O2 sensor output voltage	
			P2423	84H	84H	O2 storage index in HC trap catalyst	
LYST		Three way catalyst function (Bank2)	P0430	80H	01H	O2 storage index	
	22H		P0430	82H	01H	Switching time lag engine exhaust in- dex value	
	2211		P2424	83H	0CH	Difference in 3rd O2 sensor output voltage	
			P2424	84H	84H	O2 storage index in HC trap catalyst	
			P0400	80H	96H	Low flow faults: EGR temp change rate (short term)	
			P0400	81H	96H	Low flow faults: EGR temp change rate (long term)	
EGR	31H	EGR function	P0400	82H	96H	Low flow faults: Difference between max EGR temp and EGR temp under idling condition	
SYSTEM	310		P0400	83H	96H	Low flow faults: Max EGR temp	
			P1402	84H	96H	High Flow Faults: EGR temp increase rate	
			P0402	85H	FCH	EGR differential pressure high flow	
			P0401	86H	37H	EGR differential pressure low flow	
			P2457	87H	96H	EGR temperature	

< ECU DIAGNOSIS INFORMATION >

				li	e and Test mit		A
Item	OBD- MID	Self-diagnostic test item	DTC	TID	display) Unitand Scaling ID	Description	EC
			P0011	80H	9DH	VTC intake function diagnosis (VTC alignment check diagnosis)	С
			P0014	81H	9DH	VTC exhaust function diagnosis (VTC alignment check diagnosis)	
			P0011	82H	9DH	VTC intake function diagnosis (VTC drive failure diagnosis)	D
	35H	VVT Monitor (Bank1)	P0014	83H	9DH	VTC exhaust function diagnosis (VTC drive failure diagnosis)	E
	5511		P100A	84H	10H	VEL slow response diagnosis	
			P1090	85H	10H	VEL servo system diagnosis	
			P0011	86H	9DH	VTC intake intermediate lock function diagnosis (VTC intermediate position alignment check diagnosis)	F
VVT			Advanced: P052A Retarded: P052B	87H	9DH	VTC intake intermediate lock system diagnosis (VTC intermediate lock posi- tion check diagnosis)	G
SYSTEM			P0021	80H	9DH	VTC intake function diagnosis (VTC alignment check diagnosis)	Н
		VVT Monitor (Bank2)	P0024	81H	9DH	VTC exhaust function diagnosis (VTC alignment check diagnosis)	
			P0021	82H	9DH	VTC intake function diagnosis (VTC drive failure diagnosis)	
	36H		P0024	83H	9DH	VTC exhaust function diagnosis (VTC drive failure diagnosis)	J
	5011		P100B	84H	10H	VEL slow response diagnosis	
			P1093	85H	10H	VEL servo system diagnosis	K
			P0021	86H	9DH	VTC intake intermediate lock function diagnosis (VTC intermediate position alignment check diagnosis)	
			Advanced: P052C Retarded: P052D	87H	9DH	VTC intake intermediate lock system diagnosis (VTC intermediate lock posi- tion check diagnosis)	L
	39H	EVAP control system leak (Cap Off)	P0455	80H	0CH	Difference in pressure sensor output voltage before and after pull down	Μ
	3BH	EVAP control system leak (Small leak)	P0442	80H	05H	Leak area index (for more than 0.04 inch)	Ν
EVAP			P0456	80H	05H	Leak area index (for more than 0.02 inch)	
EVAP SYSTEM	3CH	EVAP control system leak (Very small leak)	P0456	81H	FDH	Maximum internal pressure of EVAP system during monitoring	0
			P0456	82H	FDH	Internal pressure of EVAP system at the end of monitoring	Р
	3DH	Purge flow system	P0441	83H	осн	Difference in pressure sensor output voltage before and after vent control valve close	

< ECU DIAGNOSIS INFORMATION >

	OBD-			lir	e and Test nit display)		
Item	MID	Self-diagnostic test item	DTC	TID	Unitand Scaling ID	Description	
	41H	A/F sensor 1 heater (Bank 1)	Low Input: P0031 High Input: P0032	81H	0BH	Converted value of heater electric cur- rent to voltage	
			P0030	83H	0BH	A/F sensor heater circuit malfunction	
O2 SEN- SOR HEATER 45H 46H	42H	Heated oxygen sensor 2 heat- er (Bank 1)	Low Input: P0037 High Input: P0038	80H	0CH	Converted value of heater electric cur- rent to voltage	
			P0141	81H	14H	Rear O2 sensor internal impedance	
	43H	Heated oxygen sensor 3 heat- er (Bank 1)	P0043	80H	0CH	Converted value of heater electric cur- rent to voltage	
	45H	A/F sensor 1 heater (Bank 2)	Low Input: P0051 High Input: P0052	81H	0BH	Converted value of heater electric cur- rent to voltage	
			P0036	83H	0BH	A/F sensor heater circuit malfunction	
	46H	Heated oxygen sensor 2 heat- er (Bank 2)	Low Input: P0057 High Input: P0058	80H	0CH	Converted value of heater electric cur- rent to voltage	
			P0161	81H	14CH	Rear O2 sensor internal impedance	
	47H	Heated oxygen sensor 3 heat- er (Bank 2)	P0063	80H	0CH	Converted value of heater electric cur- rent to voltage	
			P0411	80H	01H	Secondary air injection system incor- rect flow detected	
			Bank1: P0491 Bank2: P0492	81H	01H	Secondary air injection system insufficient flow	
			P2445	82H	01H	Secondary air injection system pump stuck off	
SEC- OND- ARY AIR	71H	Secondary air system	P2448	83H	01H	Secondary air injection system high airflow	
			Bank1: P2440 Bank2: P2442	84H	01H	Secondary air injection system switch- ing valve stuck open	
			P2440	85H	01H	Secondary air injection system switch- ing valve stuck open	
			P2444	86H	01H	Secondary air injection system pump stuck on	

< ECU DIAGNOSIS INFORMATION >

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)- Self-diagnostic test item		Test value and Test limit			
Item	OBD-		DTC	(GST	display)	Description	
	MID			TID	Unitand Scaling ID		EC
			P0171 or P0172	80H	2FH	Long term fuel trim	-
FUEL SYSTEM			P0171 or P0172	81H	24H	The number of lambda control clamped	С
			P117A / P219A	82H	03H	Cylinder A/F imbalance monitoring	_
			P219C	83H	83H	Air-fuel ratio cylinder imbalance diag- nosis CPS (Crankshaft Position Sen- sor) method #1 cylinder parameter	D
			P219D	84H	83H	Air-fuel ratio cylinder imbalance diag- nosis CPS (Crankshaft Position Sen- sor) method #2 cylinder parameter	E
	81H	Fuel injection system function (Bank 1)	P219E	85H	83H	Air-fuel ratio cylinder imbalance diag- nosis CPS (Crankshaft Position Sen- sor) method #3 cylinder parameter	F
			P219F	86H	83H	Air-fuel ratio cylinder imbalance diag- nosis CPS (Crankshaft Position Sen- sor) method #4 cylinder parameter	G
			P21A0	87H	83H	Air-fuel ratio cylinder imbalance diag- nosis CPS (Crankshaft Position Sen- sor) method #5 cylinder parameter	Н
			P21A2	89H	83H	Air-fuel ratio cylinder imbalance diag- nosis CPS (Crankshaft Position Sen- sor) method #7 cylinder parameter	
			P0174 or P0175	80H	2FH	Long term fuel trim	-
			P0174 or P0175	81H	24H	The number of lambda control clamped	J
			P117B / P219B	82H	03H	Cylinder A/F imbalance monitoring	_
			P219D	84H	83H	Air-fuel ratio cylinder imbalance diag- nosis CPS (Crankshaft Position Sen- sor) method #2 cylinder parameter	K
	82H	Fuel injection system function (Bank 2)	P219F	86H	83H	Air-fuel ratio cylinder imbalance diag- nosis CPS (Crankshaft Position Sen- sor) method #4 cylinder parameter	L
			P21A1	88H	83H	Air-fuel ratio cylinder imbalance diag- nosis CPS (Crankshaft Position Sen- sor) method #6 cylinder parameter	Μ
			P21A3	8AH	83H	Air-fuel ratio cylinder imbalance diag- nosis CPS (Crankshaft Position Sen- sor) method #8 cylinder parameter	N

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< ECU DIAGNOSIS INFORMATION >

	OBD-			lir	e and Test mit display)			
Item	MID	Self-diagnostic test item	DTC	TID	Unitand Scaling ID	Description		
			P0301	80H	24H	Misfiring counter at 1000 revolution of the first cylinder		
			P0302	81H	24H	Misfiring counter at 1000 revolution of the second cylinder		
			P0303	82H	24H	Misfiring counter at 1000 revolution of the third cylinder		
			P0304	83H	24H	Misfiring counter at 1000 revolution of the fourth cylinder		
MISFIRE A1			P0305	84H	24H	Misfiring counter at 1000 revolution of the fifth cylinder		
		H Multiple cylinder misfires	P0306	85H	24H	Misfiring counter at 1000 revolution of the sixth cylinder		
			P0307	86H	24H	Misfiring counter at 1000 revolution of the seventh cylinder		
			P0308	87H	24H	Misfiring counter at 1000 revolution of the eighth cylinder		
				P0300	88H	24H	Misfiring counter at 1000 revolution of the multiple cylinders	
			P0301	89H	24H	Misfiring counter at 200 revolution of the first cylinder		
	A1H		P0302	8AH	24H	Misfiring counter at 200 revolution of the second cylinder		
			P0303	8BH	24H	Misfiring counter at 200 revolution of the third cylinder		
			P0304	8CH	24H	Misfiring counter at 200 revolution of the fourth cylinder		
			P0305	8DH	24H	Misfiring counter at 200 revolution of the fifth cylinder		
			P0306	8EH	24H	Misfiring counter at 200 revolution of the sixth cylinder		
					P0307	8FH	24H	Misfiring counter at 200 revolution of the seventh cylinder
			P0308	90H	24H	Misfiring counter at 200 revolution of the eighth cylinder		
			P0300	91H	24H	Misfiring counter at 1000 revolution of the single cylinder		
			P0300	92H	24H	Misfiring counter at 200 revolution of the single cylinder		
			P0300	93H	24H	Misfiring counter at 200 revolution of the multiple cylinders		

< ECU DIAGNOSIS INFORMATION >

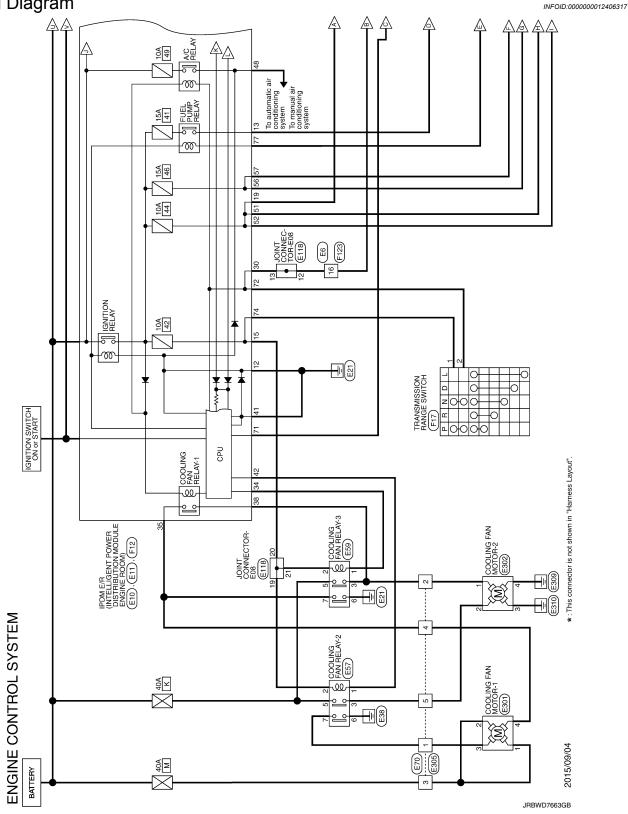
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litem	OBD-	Self-diagnostic test item	DTC		display)	Description	
item	MID			TID	Unitand Scaling ID	Description	
	A2H	No. 1 cylinder misfire	P0301	ОВН	24H	EWMA (Exponential Weighted Moving Average) misfire counts for last 10 driv- ing cycles	
			P0301	0CH	24H	Misfire counts for last/current driving cycles	
	A3H	No. 2 cylinder misfire	P0302	ОВН	24H	EWMA (Exponential Weighted Moving Average) misfire counts for last 10 driv- ing cycles	
			P0302	0CH	24H	Misfire counts for last/current driving cycles	
A4H	A4H	H No. 3 cylinder misfire	P0303	0BH	24H	EWMA (Exponential Weighted Moving Average) misfire counts for last 10 driv- ing cycles	
			P0303	0CH	24H	Misfire counts for last/current driving cycles	
MISFIRE	A5H	No. 4 cylinder misfire	P0304	ОВН	24H	EWMA (Exponential Weighted Moving Average) misfire counts for last 10 driv- ing cycles	
			P0304	0CH	24H	Misfire counts for last/current driving cycles	
	A6H	No. 5 cylinder misfire	P0305	ОВН	24H	EWMA (Exponential Weighted Moving Average) misfire counts for last 10 driv- ing cycles	
			P0305	0CH	24H	Misfire counts for last/current driving cycles	
	A7H	No. 6 cylinder misfire	P0306	ОВН	24H	EWMA (Exponential Weighted Moving Average) misfire counts for last 10 driv- ing cycles	
			P0306	0CH	24H	Misfire counts for last/current driving cycles	
A8H	No. 7 cylinder misfire	A8H No. 7 cylinder misfire	P0307	ОВН	24H	EWMA (Exponential Weighted Moving Average) misfire counts for last 10 driv- ing cycles	
			P0307	0CH	24H	Misfire counts for last/current driving cycles	
	A9H	No. 8 cylinder misfire	P0308	овн	24H	EWMA (Exponential Weighted Moving Average) misfire counts for last 10 driv- ing cycles	
			P0308	0CH	24H	Misfire counts for last/current driving cycles	

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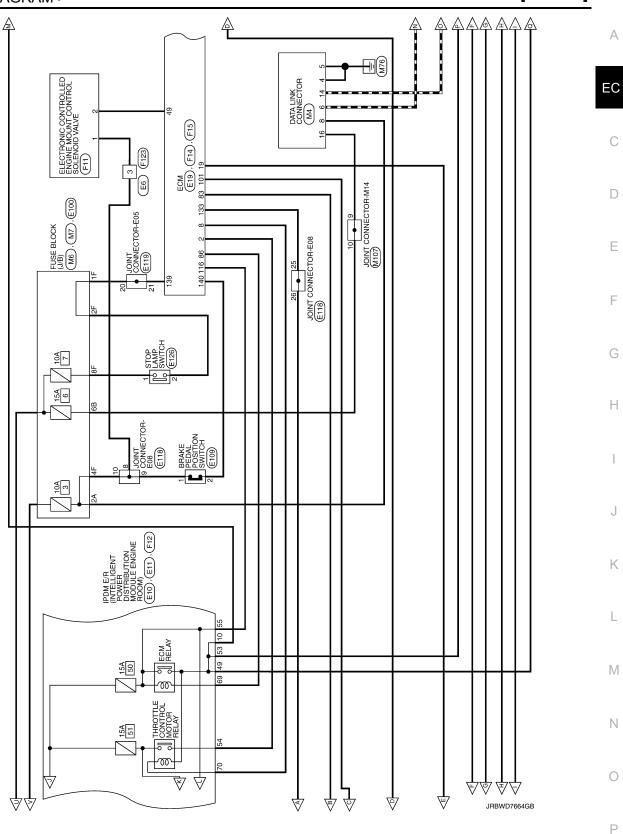
WIRING DIAGRAM ENGINE CONTROL SYSTEM

Wiring Diagram



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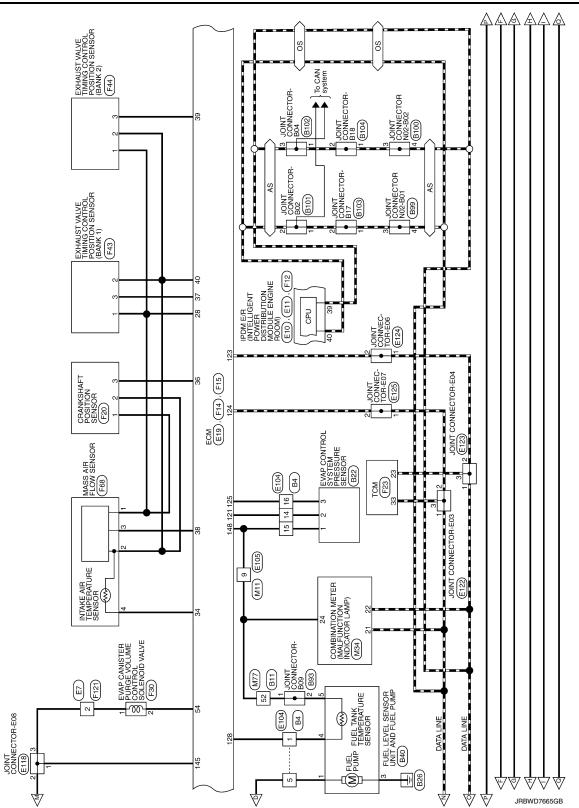
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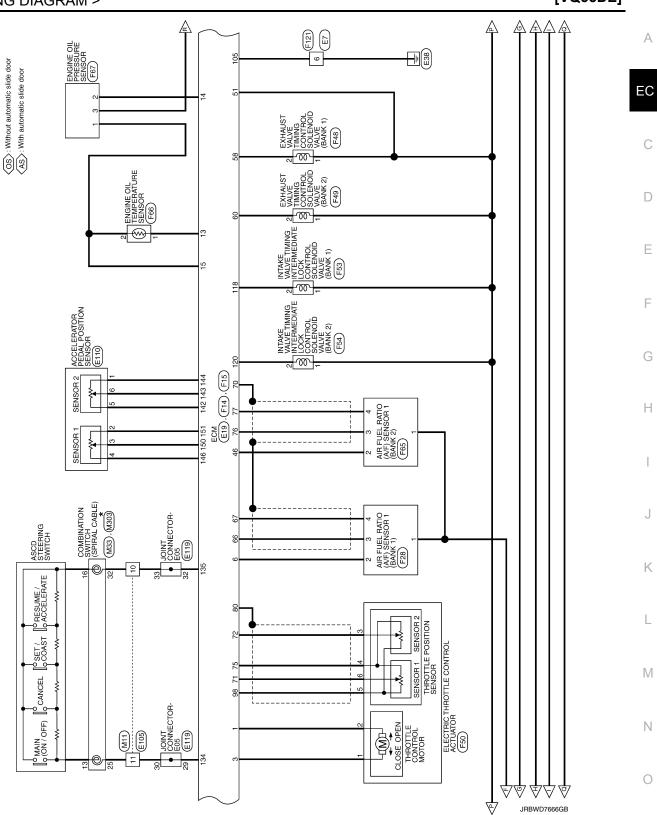
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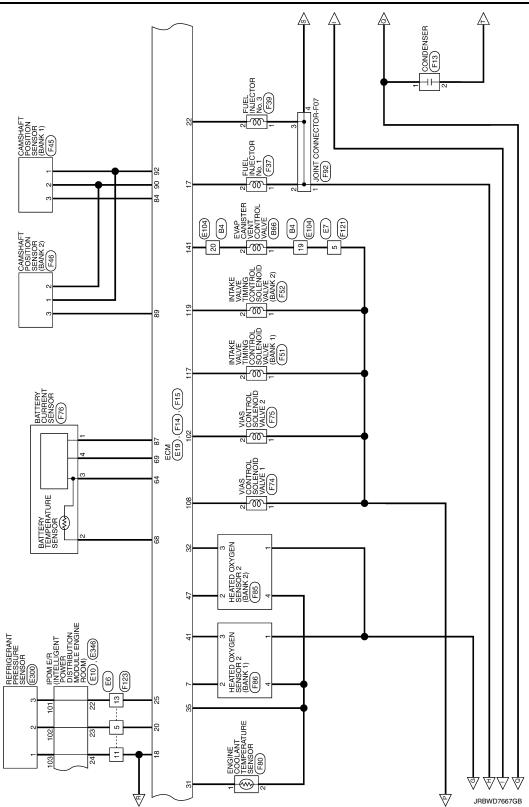
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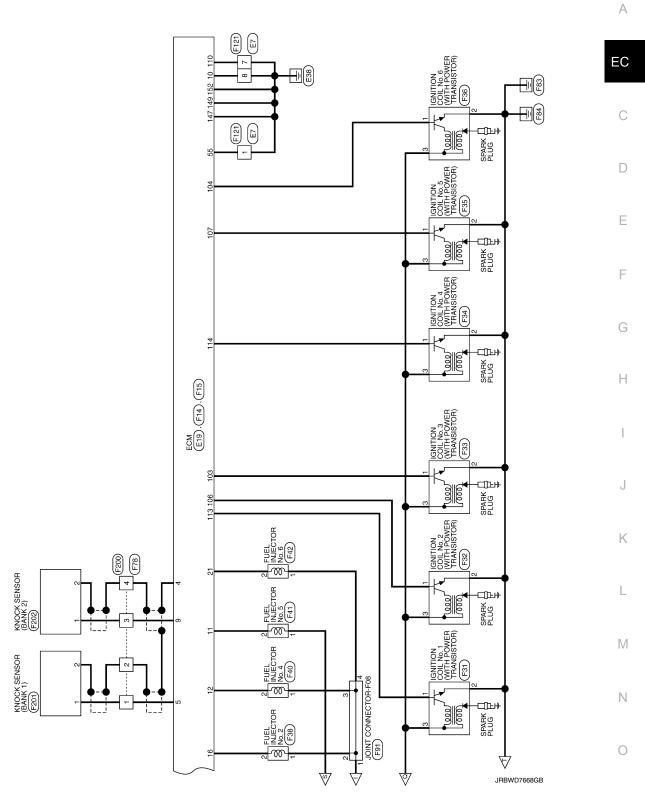
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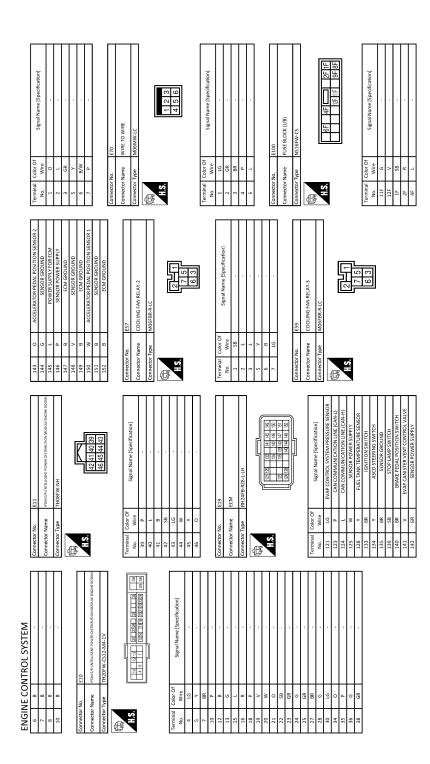
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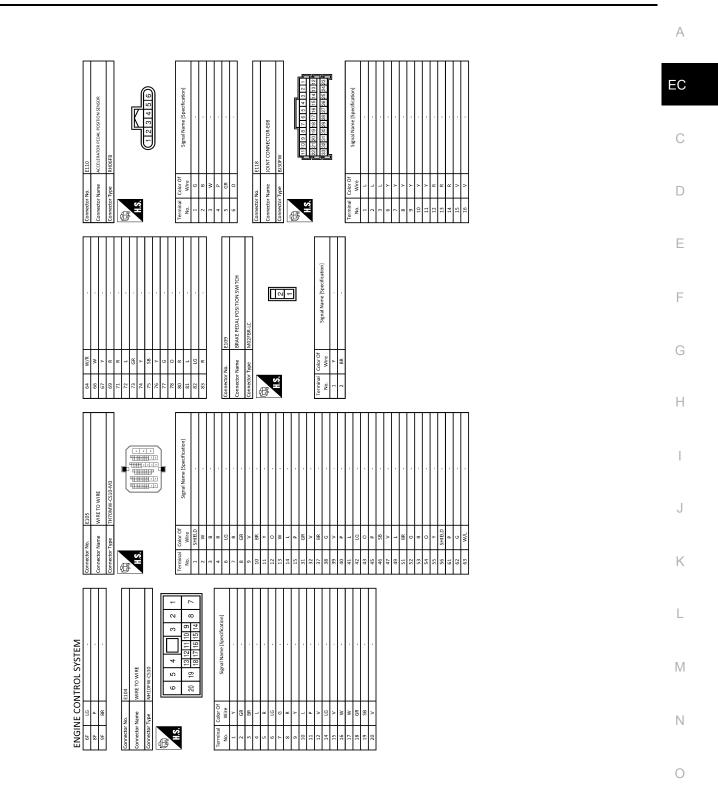
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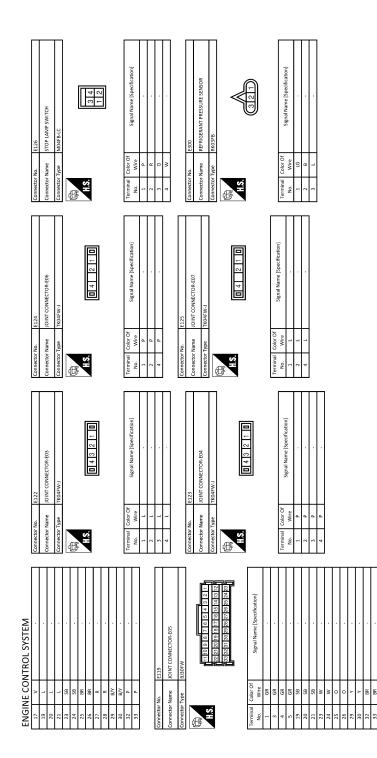
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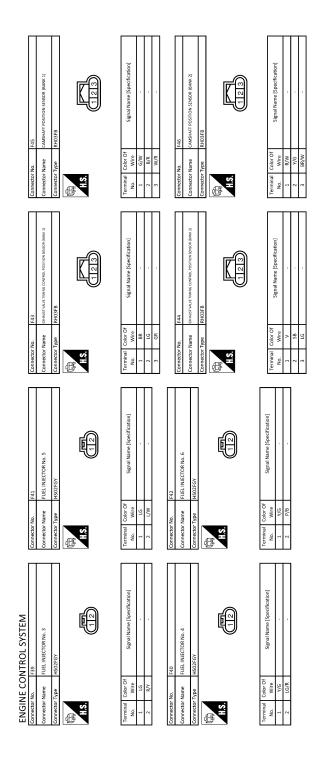
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V A/F SENSOR 1 (BANK 2) GR SHIELD R SHIELD M/P CAMMUNCT DOTATION CENACO PLANW 11	W/R CAMPANET TO EXILVE STATE OF A CONTRIBUTION W/B EXAME TO EXILVE STATE OF A CONTRIBUTION R/V SERSOR POWER SUPPLY R/W CAMPANET POSITION SERSOR (BANK 2) B/R SERSOR ROUND		VIAS	B ECM GEONID YR IGNITION SIGNAL No. 1 W IGNITION SIGNAL No. 1 WL ROWER SUPPLY FOR ECM (BACK-UP) RM IMMERIZED AVIETABLIANK IA R IMMERIZED AVIETABLIANK IA	Handram Handram	or Type Trox/of/B-H54	2 6 5 1 wre Signal Name (Specification)	842W - 842W - 943 - 943 - 944 - 945 - 944 - 945 - 947 - 948 - 949 - 940 - 944 - 944 -
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19 B 20 R 21 P/B 23 P/B	25 G 25 G 31 Y 32 W/L		+++++	49 BR/W 51 L 54 P/L 55 B/Y	Connector No. Connector Name Connector Type		Terminal Color Of No. Wire 58 P/B 60 W 64 G/B 66 L 67 P 68 W	++++++
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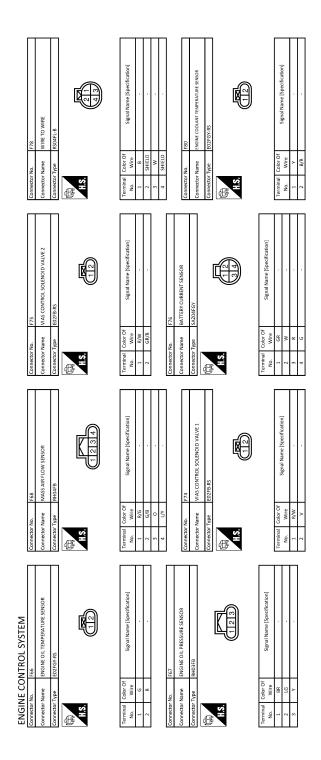
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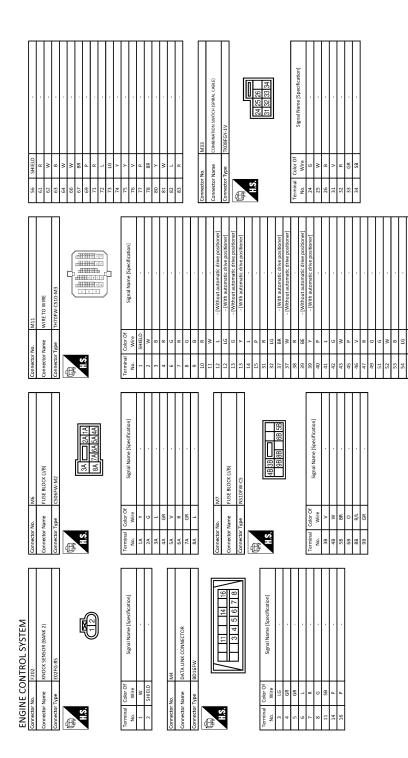
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ENGINE CONTROL SYSTEM

< WIRING DIAGRAM >

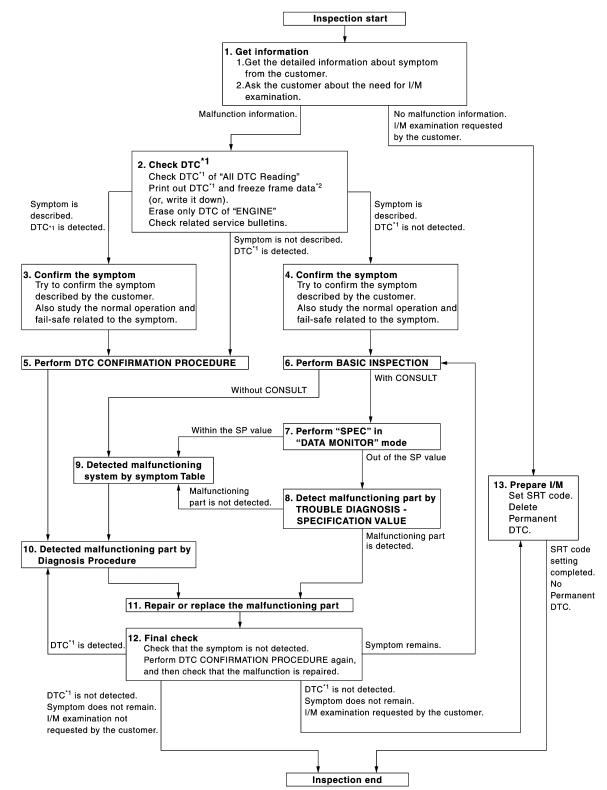
[VQ35DE]

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BASIC INSPECTION DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

OVERALL SEQUENCE



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INFOID:000000012406318

< BASIC INSPECTION >

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*1: Include 1st trip DTC. А *2: Include 1st trip freeze frame data. DETAILED FLOW EC **1**.GET INFORMATION FOR SYMPTOM Get the detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred) using the "Diagnostic Work Sheet". (Refer to EC-139, "Diagnostic Work Sheet".) Ask if the customer requests I/M examination. D Malfunction information, obtained>>GO TO 2. No Malfunction information, but a request for I/M examination>>GO TO 13. 2.CHECK DTC Ε Check DTC of "All DTC Reading". Perform the following procedure if DTC is displayed. Record DTC and freeze frame data. (Print them out with CONSULT or GST.) Erase only DTC of "ENGINE". 🕅 With CONSULT: Refer to "How to Erase DTC and 1st Trip DTC" in EC-73, "CONSULT Function". R Without CONSULT: Refer to "How to Erase Self-diagnostic Results" in EC-70, "On Board Diagnosis Function". Turn ignition switch OFF. Study the relationship between the cause detected by DTC and the symptom described by the customer. Н (Symptom Table is useful. Refer to EC-503, "Symptom Table".) Check related service bulletins for information. Are any symptoms described and any DTCs detected? Symptom is described, DTC is detected>>GO TO 3. Symptom is described, DTC is not detected>>GO TO 4. Symptom is not described, DTC is detected>>GO TO 5. 3. CONFIRM THE SYMPTOM Try to confirm the symptom described by the customer (except MIL ON). Also study the normal operation and fail-safe related to the symptom. Refer to EC-507, "Description" and EC-K 99, "Fail-safe". Diagnosis Work Sheet is useful to verify the incident. Verify relation between the symptom and the condition when the symptom is detected. >> GO TO 5. **4.**CONFIRM THE SYMPTOM M Try to confirm the symptom described by the customer. Also study the normal operation and fail-safe related to the symptom. Refer to EC-507, "Description" and EC-99. "Fail-safe". Ν Diagnosis Work Sheet is useful to verify the incident. Verify relation between the symptom and the condition when the symptom is detected. >> GO TO 6. 5.PERFORM DTC CONFIRMATION PROCEDURE P Perform DTC CONFIRMATION PROCEDURE for the displayed DTC, and then make sure that DTC is detected again.

If two or more DTCs are detected, refer to EC-101, "DTC Inspection Priority Chart" and determine trouble diagnosis order.

NOTE:

Freeze frame data is useful if the DTC is not detected.

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

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

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

Is DTC detected?

- YES >> GO TO 10.
- NO >> Check according to <u>GI-41, "Intermittent Incident"</u>.

Ó.PERFORM BASIC INSPECTION

Perform EC-141, "Work Procedure".

Do you have CONSULT?

YES >> GO TO 7.

NO >> GO TO 9.

7.PERFORM SPEC IN DATA MONITOR MODE

With CONSULT

Make sure that "MASS AIR FLOW SENSOR (Hz)", "B/FUEL SCHDL", "A/F ALPHA-B1" and "A/F ALPHA-B2" are within the SP value using CONSULT "SPEC" in "DATA MONITOR" mode of "ENGINE". Refer to <u>EC-167</u>, <u>"Component Function Check"</u>.

Is the measurement value within the SP value?

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

 $\mathbf{8}$. DETECT MALFUNCTIONING PART BY TROUBLE DIAGNOSIS - SPECIFICATION VALUE

Detect malfunctioning part according to EC-168, "Diagnosis Procedure".

Is a malfunctioning part detected?

YES >> GO TO 11.

NO >> GO TO 9.

9. DETECT MALFUNCTIONING SYSTEM BY SYMPTOM TABLE

Detect malfunctioning system according to <u>EC-503</u>, "<u>Symptom Table</u>" based on the confirmed symptom in step 4, and determine the trouble diagnosis order based on possible causes and symptoms.

>> GO TO 10.

10. DETECT MALFUNCTIONING PART BY DIAGNOSIS PROCEDURE

Inspect according to Diagnosis Procedure of the system. **NOTE:**

The Diagnosis Procedure in EC section described based on open circuit inspection. A short circuit inspection is also required for the circuit check in the Diagnosis Procedure. For details, refer to <u>GI-44</u>, "<u>Circuit Inspection</u>".

Is a malfunctioning part detected?

YES >> GO TO 11.

NO >> Monitor input data from related sensors or check voltage of related ECM terminals using CON-SULT. Refer to <u>EC-83, "Reference Value"</u>.

11.REPAIR OR REPLACE THE MALFUNCTIONING PART

- 1. Repair or replace the malfunctioning part.
- 2. Reconnect parts or connectors disconnected during Diagnosis Procedure again after repair and replacement.
- Check DTC. If DTC is displayed, erase it.
 With CONSULT: Refer to "How to Erase DTC and 1st Trip DTC" in <u>EC-73, "CONSULT Function"</u>.
 Without CONSULT: Refer to "How to Erase Self-diagnostic Results" in <u>EC-70, "On Board Diagnosis Function"</u>.

>> GO TO 12.

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[VQ35DE]

12.FINAL CHECK А When DTC was detected in step 2, perform DTC CONFIRMATION PROCEDURE or Component Function Check again, and then make sure that the malfunction have been completely repaired. When symptom was described from the customer, refer to confirmed symptom in step 3 or 4, and make sure EC that the symptom is not detected. Is DTC detected and does symptom remain? YES-1 >> DTC is detected: GO TO 10. YES-2 >> Symptom remains: GO TO 6. NO-1 >> No request for I/M examination from the customer. Before returning the vehicle to the customer, always erase unnecessary DTC in ECM and TCM (🕅 With CONSULT: Refer to "How to Read DTC and 1st Trip DTC" in EC-73, "CONSULT Function", (R) Without CONSULT: Refer to "How to D Read Self-diagnostic Results" in EC-70, "On Board Diagnosis Function"). NO-2 >> I/M examination, requested from the customer: GO TO 13. **13.**PREPARE FOR I/M EXAMINATION Е Set SRT codes. Refer to EC-155, "Description". 1. Erase permanent DTCs. Refer to <u>EC-161, "Description"</u>. F >> INSPECTION END. Diagnostic Work Sheet INFOID:000000012406319 DESCRIPTION Н There are many operating conditions that lead to the malfunction of engine components. A good grasp of such conditions can make trou-**KEY POINTS** bleshooting faster and more accurate. In general, each customer feels differently about symptoms. It is WHAT Vehicle & engine model important to fully understand the symptoms or conditions for a cus-WHEN Date, Frequencies tomer complaint. WHERE..... Road conditions Utilize a diagnostic worksheet like the WORKSHEET SAMPLE HOW Operating conditions, below in order to organize all the information for troubleshooting. Weather conditions, Some conditions may cause the MIL to illuminate or blink, and DTC Symptoms to be detected. Examples: · Vehicle ran out of fuel, which caused the engine to misfire. Κ SEE907I · Fuel filler cap was left off or incorrectly screwed on, allowing fuel to evaporate into the atmosphere.

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DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

WORKSHEET SAMPLE

Customer name 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. 				
Symptoms	☐ Startability	 Impossible to start In No combustion In Partial combustion Partial combustion affected by throttle position Partial combustion NOT affected by throttle position Possible but hard to start In Others [In International Internatinternational International International International Inter				
	🗌 Idling	□ No fast idle □ Unstable □ H □ Others [High idle 🔲 Low idle]			
	Driveability	Stumble Surge Knock Intake backfire Exhaust backfi Others [Lack of power re]			
	Engine stall	At the time of start While idling While accelerating While decelerating Just after stopping While loading				
Incident occu	irrence	☐ Just after delivery ☐ Recently ☐ In the morning ☐ At night ☐ In the daytime				
Frequency		All the time Under certain conditions Sometimes				
Weather cond	ditions	□ Not affected				
	Weather	Fine Raining Snowing	Others []			
	Temperature	🗌 Hot 🗌 Warm 🗌 Cool 🗌] Cold 🔲 Humid °F			
		Cold During warm-up	After warm-up			
Engine conditions		Engine speed 0 2,000	4,000 6,000 8,000 rpm			
Road conditions		🗌 In town 🗌 In suburbs 🗌 Hig	hway 🗌 Off road (up/down)			
Driving conditions		 Not affected At starting While idling At racing While accelerating While cruising While decelerating While turning (RH/LH) 				
		Vehicle speed 0 10 20	30 40 50 60 MPH			
Malfunction indicator lamp		☐ Turned on ☐ Not turned on				

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< BASIC INSPECTION >

BASIC INSPECTION

Work Procedure

INFOID:000000012406320

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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 leakage
- Air cleaner clogging _
- Gasket

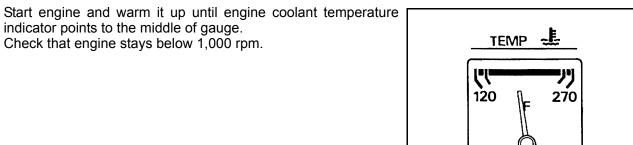
4.

- 3. Check that electrical or mechanical loads are not applied.
- Head lamp switch is OFF.
- Air conditioner switch is OFF.
- Rear window defogger switch is OFF.

indicator points to the middle of gauge.

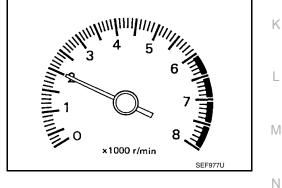
Check that engine stays below 1,000 rpm.

Steering wheel is in the straight-ahead position, etc.



- Run engine at approximately 2,000 rpm for approximately 2 min-5. utes under no load.
- 6. Check that no DTC is displayed with CONSULT or GST.
- Are any DTCs detected?

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



2.REPAIR OR REPLACE

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

>> GO TO 3

3.CHECK TARGET IDLE SPEED

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

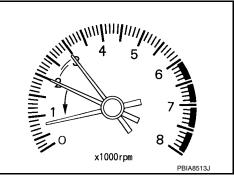
BASIC INSPECTION

< BASIC INSPECTION >

- 2. Rev engine (2,000 to 3,000 rpm) 2 or 3 times under no load, then run engine at idle speed for approximately 1 minute.
- 3. Check idle speed. For procedure, refer to EC-508, "Work Procedure". For specification, refer to EC-514, "Idle Speed".

Is the inspection result normal?

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



4.PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING

- 1. Stop engine.
- Perform EC-147, "Description". 2.

>> GO TO 5.

5. PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Perform EC-148, "Description".

>> GO TO 6.

Ó.PERFORM IDLE AIR VOLUME LEARNING

Perform EC-149, "Description".

Is Idle Air Volume Learning carried out successfully?

YES >> GO TO 7.

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

7. CHECK IDLE SPEED AGAIN

1. Start engine and warm it up to normal operating temperature.

2. Check idle speed. For procedure, refer to EC-508, "Work Procedure". For specification, refer to EC-514, "Idle Speed".

Is the inspection result normal?

- YES >> GO TO 10. NO >> GO TO 8.
- 8. DETECT MALFUNCTIONING PART

Check the Following.

- Check camshaft position sensor (PHASE) and circuit. Refer to <u>EC-301, "Diagnosis Procedure"</u>.
- Check crankshaft position sensor (POS) and circuit. Refer to EC-298, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 9.

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

9. CHECK ECM FUNCTION

- 1. Substitute with a non-malfunctioning ECM to check ECM function. (ECM may be the cause of the incident, although this is rare.)
- 2. Perform initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key IDs. Refer to SEC-60, "ECM : Work Procedure".

>> GO TO 4.

10.CHECK IGNITION TIMING

- Run engine at idle. 1.
- Check ignition timing with a timing light. 2. For procedure, refer to EC-509, "Work Procedure".

BASIC INSPECTION

< BASIC INSPECTION >	[VQ35DE]	
For specification, refer to EC-514, "Ignition Timing".		
Is the inspection result normal?		A
YES >> GO TO 19. NO >> GO TO 11.		
11.PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING	E	EC
1. Stop engine.		
2. Perform <u>EC-147, "Description"</u> .		С
>> GO TO 12.		
12. PERFORM THROTTLE VALVE CLOSED POSITION LEARNING		D
Perform EC-148, "Description".		
		E
>> GO TO 13.		
13.PERFORM IDLE AIR VOLUME LEARNING		
Perform <u>EC-149, "Description"</u> .		F
<u>Is Idle Air Volume Learning carried out successfully?</u> YES >> GO TO 14.		
NO >> Follow the instruction of Idle Air Volume Learning. Then GO TO 4.		G
14.CHECK IDLE SPEED AGAIN		
1. Start engine and warm it up to normal operating temperature.		Н
 Check idle speed. For procedure, refer to <u>EC-508, "Work Procedure"</u>. 		
For specification, refer to <u>EC-514, "Idle Speed"</u> .		
Is the inspection result normal?		1
YES >> GO TO 15. NO >> GO TO 17.		
15. CHECK IGNITION TIMING AGAIN		J
1. Run engine at idle.		
2. Check ignition timing with a timing light.		K
For procedure, refer to <u>EC-509, "Work Procedure"</u> . For specification, refer to <u>EC-514, "Ignition Timing"</u> .		
Is the inspection result normal?		L
YES >> GO TO 19. NO >> GO TO 16.		
16. CHECK TIMING CHAIN INSTALLATION	ſ	M
Check timing chain installation. Refer to EM-85, "Inspection".		IVI
Is the inspection result normal?		
YES >> GO TO 17.		Ν
NO >> Repair the timing chain installation. Then GO TO 4.		
17.DETECT MALFUNCTIONING PART		0
 Check the following. Check camshaft position sensor (PHASE) and circuit. Refer to <u>EC-301, "Diagnosis Procedure"</u>. 		
Check crankshaft position sensor (POS) and circuit. Refer to EC-298, "Diagnosis Procedure".		Ρ
Is the inspection result normal?		
YES >> GO TO 18. NO >> Repair or replace malfunctioning part. Then GO TO 4.		
18. CHECK ECM FUNCTION		
1. Substitute with a non-malfunctioning ECM to check ECM function. (ECM may be the cause of	the incident,	

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although this is rare.)

BASIC INSPECTION

< BASIC INSPECTION >

 Perform initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key IDs. Refer to EC-145, "Description".

>> GO TO 4.

19.INSPECTION END

If ECM is replaced during this BASIC INSPECTION procedure, perform EC-145, "Description".

>> INSPECTION END

ADDITIONAL SERVICE WHEN REPLACING ECM

< BASIC INSPECTION >	[VQ35DE]	
ADDITIONAL SERVICE WHEN REPLACING ECM		
Description	INFOID:000000012406321	
When replacing ECM, the following procedure must be performed. (For details, refer to <u>EC-14</u> dure".)	5, "Work Proce-	F
PROGRAMMING OPERATION	-	
NOTE: After replacing with a blank ECM, programming is required to write ECM information. Be sure to cedure to perform the programming.	o follow the pro-	
BEFORE REPLACEMENT When replacing ECM, perform "SAVING DATA FOR REPLC CPU" in "WORK SUPPORT" o using CONSULT to save current ECM data before replacement.	of "ENGINE" by	
AFTER REPLACEMENT After replacing ECM, the following items must be performed: • Write data after replace CPU		
 Accelerator pedal released position learning Throttle valve closed position learning Idle air volume learning 		
Nork Procedure	INFOID:000000012406322	
1.SAVE ECM DATA		
 With CONSULT Turn ignition switch OFF. Reconnect all harness connectors disconnected. 		
 Turn ignition switch ON. Select "SAVING DATA FOR REPLC CPU" in "WORK SUPPORT" mode of "ENGINE" usin Follow the instruction of CONSULT display. 	g CONSULT.	
 NOTE: Necessary data in ECM is copied and saved to CONSULT. Go to Step 2 regardless of with or without success in saving data. 		
>> GO TO 2.		
2.CHECK ECM PART NUMBER		
Check ECM part number to see whether it is blank ECM or not. NOTE:		
 Part number of blank ECM is 23703 - xxxxx. Check part number when ordering ECM or the one included in the label on the container box 		
s the ECM a blank ECM? YES >> GO TO 3. NO >> GO TO 5.		
3. SAVE ECM PART NUMBER		
Read out the part number from the old ECM and save the number, following the programmi Refer to CONSULT Operation Manual.	ng instructions.	
NOTE:		
NOTE: The ECM part number is saved in CONSULT. Even when ECM part number is not saved in CONSULT, go to 4.		
The ECM part number is saved in CONSULT.		

• Refer to EC-513, "Removal and Installation" for replacement of ECM.

ADDITIONAL SERVICE WHEN REPLACING ECM

< BASIC INSPECTION >

- During programming, maintain the following conditions:
- Ignition switch: ON
- Electric load: OFF
- Brake pedal: Not depressed
- Battery voltage: 12 13.5 V (Be sure to check the value of battery voltage by selecting "BATTERY VOLT" in "Data monitor" of CONSULT.)

>> GO TO 6.

5.REPLACE ECM

Replace ECM. Refer to EC-513, "Removal and Installation".

>> GO TO 6.

m{0}. PERFORM INITIALIZATION OF IVIS (NATS) SYSTEM AND REGISTRATION OF ALL IVIS (NATS) IGNITION KEY IDS

Refer to SEC-60, "ECM : Description".

>> GO TO 7.

7.CHECK ECM DATA STATUS

Check if the data is successfully copied from the ECM at Step 1 (before replacement) and saved in CONSULT. Is the data saved successfully?

YES >> GO TO 8. NO >> GO TO 9. 8.WRITE ECM DATA

()With CONSULT

1. Select "WRITING DATA FOR REPLC CPU" in "WORK SUPPORT" mode of "ENGINE" using CONSULT.

2. Follow the instruction of CONSULT display.

NOTE:

The data saved by "SAVING DATA FOR REPLC CPU" is written to ECM.

>> GO TO 10.

9.PERFORM VIN REGISTRATION

Refer to EC-152, "Description".

>> GO TO 10.

10. PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING

Perform Accelerator Pedal Released Position Learning. Refer to EC-147, "Description".

>> GO TO 11.

11.PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Perform Throttle Valve Closed Position Learning. Refer to EC-148, "Description".

>> GO TO 12.

12.PERFORM IDLE AIR VOLUME LEARNING

Perform Idle Air Volume Learning. Refer to EC-149, "Description".

>> END

ACCELERATOR PEDAL RELEASED POSITION LEARNING

< BASIC INSPECTION >

ACCELERATOR PEDAL RELEASED POSITION LEARNING

Description

Accelerator Pedal Released Position Learning is a function of ECM to learn the fully released position of the accelerator pedal by monitoring the accelerator pedal position sensor output signal. It must be performed each time the harness connector of the accelerator pedal position sensor or ECM is disconnected. (For details, refer to EC-147, "Work Procedure".)

Work Procedure

INFOID:000000012406324

INFOID:000000012406323

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1.start	D
 Check that accelerator pedal is fully released. Turn ignition switch ON and wait at least 2 seconds. Turn ignition switch OFF and wait at least 10 seconds. Turn ignition switch ON and wait at least 2 seconds. Turn ignition switch OFF and wait at least 10 seconds. Turn ignition switch OFF and wait at least 10 seconds. 	E
>> END	F
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THROTTLE VALVE CLOSED POSITION LEARNING

< BASIC INSPECTION >

THROTTLE VALVE CLOSED POSITION LEARNING

Description

INFOID:000000012406325

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Throttle Valve Closed Position Learning is a function of ECM to learn the fully closed position of the throttle valve by monitoring the throttle position sensor output signal. It must be performed each time the harness connector of electric throttle control actuator or ECM is disconnected or electric throttle control actuator is cleaned. (For details, refer to EC-148, "Work Procedure".)

Work Procedure

INFOID:000000012406326

1.START

WITH CONSULT

- 1. Turn ignition switch ON.
- 2. Select "CLSD THL POS LEARN" in "WORK SUPPORT" mode.
- 3. Follow the instructions on the CONSULT display.
- Turn ignition switch OFF and wait at least 10 seconds. Check that throttle valve moves during the above 10 seconds by configuration.

Check that throttle valve moves during the above 10 seconds by confirming the operating sound.

- **WITHOUT CONSULT**
- 1. Start the engine.
- NOTE:

Coolant temperature is less than 25°C (77°F) before engine starts.

- 2. Warm up the engine.
- NOTE:

Warm up the engine until "COOLAN TEMP/S" on "DATA MONITOR" of CONSULT reaches more than 65°C (149°F).

3. Turn ignition switch OFF and wait at least 10 seconds.

NOTE:

Check that throttle valve moves during the above 10 seconds by confirming the operating sound.

>> END

IDLE AIR VOLUME LEARNING

IDLE AIR VOLUME LEARNING

Description

< BASIC INSPECTION >

Idle Air Volume Learning is a function of ECM to learn the idle air volume that keeps engine idle speed within the specific range. (For details, refer to <u>EC-149, "Work Procedure"</u>.) It must be performed under the following conditions:

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

Work Procedure

1.PRECONDITIONING	D
Check that all of the following conditions are satisfied. Learning will be cancelled if any of the following conditions are missed for even a moment. • Battery voltage: More than 12.9 V (At idle)	Е
 Engine coolant temperature: 70 - 100°C (158 - 212°F) Selector lever position: P or N Electric load switch: OFF 	F
 (Air conditioner, head lamp, rear window defogger) On vehicles equipped with daytime light systems, if the parking brake is applied before the engine is started the head lamp will not illuminate. Steering wheel: Neutral (Straight-ahead position) Vehicle speed: Stopped 	G
 Transmission: Warmed-up With CONSULT: Drive vehicle until "ATF TEMP SEN" in "DATA MONITOR" mode of "CVT" system indicates less than 0.9 V. 	Η
- Without CONSULT: Drive vehicle for 10 minutes. <u>Will CONSULT be used?</u> YES >> GO TO 2.	I
NO >> GO TO 3. 2.PERFORM IDLE AIR VOLUME LEARNING	J
With CONSULT Perform <u>EC-147, "Description"</u> . Perform <u>EC-148, "Description"</u> .	Κ
 Start engine and warm it up to normal operating temperature. Select "IDLE AIR VOL LEARN" in "WORK SUPPORT" mode. Touch "START" and wait 20 seconds. 	L
<u>Is "CMPLT" displayed on CONSULT screen?</u> YES >> GO TO 4. NO >> GO TO 5.	M
3. PERFORM IDLE AIR VOLUME LEARNING	
 Without CONSULT NOTE: It is better to count the time accurately with a clock. 	Ν
 It is impossible to switch the diagnostic mode when an accelerator pedal position sensor circuit has a malfunction. Perform <u>EC-147, "Description"</u>. Perform <u>EC-148, "Description"</u>. 	0
 Start engine and warm it up to normal operating temperature. Turn ignition switch OFF and wait at least 10 seconds. Confirm that accelerator pedal is fully released, turn ignition switch ON and wait 3 seconds. Repeat the following procedure quickly 5 times within 5 seconds. Fully depress the accelerator pedal. Fully release the accelerator pedal. 	Ρ

7. Wait 7 seconds, fully depress the accelerator pedal for approx. 20 seconds until the MIL stops blinking and turns ON.

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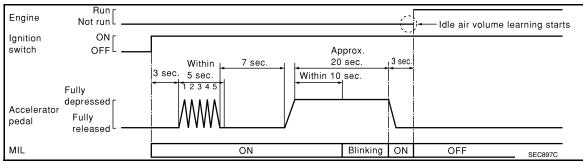
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IDLE AIR VOLUME LEARNING

< BASIC INSPECTION >

- 8. Fully release the accelerator pedal within 3 seconds after the MIL turns ON.
- 9. Start engine and let it idle.
- 10. Wait 20 seconds.



>> GO TO 4.

4.CHECK IDLE SPEED AND IGNITION TIMING

Rev up the engine 2 or 3 times and check that idle speed and ignition timing are within the specifications. For procedure, refer to <u>EC-508</u>, "<u>Work Procedure</u>" and <u>EC-509</u>, "<u>Work Procedure</u>". For specifications, refer to <u>EC-514</u>, "Idle Speed" and <u>EC-514</u>, "Ignition Timing".

Is the inspection result normal?

YES >> INSPECTION END NO >> GO TO 5.

5. DETECT MALFUNCTIONING PART-I

Check the following

- Check that throttle valve is fully closed.
- Check PCV valve operation.

• Check that downstream of throttle valve is free from air leakage.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace malfunctioning part.

Ó.DETECT MALFUNCTIONING PART-II

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

It is useful to perform "TROUBLE DIAGNOSIS - SPECIFICATION VALUE". Refer to <u>EC-167</u>, "<u>Description</u>". If any of the following conditions occur after the engine has started, eliminate the cause of the incident and perform Idle Air Volume Learning again:

• Engine stalls.

• Incorrect idle.

>> INSPECTION END

MIXTURE RATIO SELF-LEARNING VALUE CLEAR

< BASIC INSPECTION >

MIXTURE RATIO SELF-LEARNING VALUE CLEAR

Description

This describes show to erase the mixture ratio self-learning value. For the actual procedure, follow the instructions in "Diagnosis Procedure". (For details, refer to <u>EC-151, "Work Procedure"</u>.)

Work Procedure

1.START With CONSULT D 1. Start engine and warm it up to normal operating temperature. Select "SELF-LEARNING CONT" in "WORK SUPPORT" mode with CONSULT. 2. Clear mixture ratio self-learning value by touching "CLEAR". 3. With GST Е Start engine and warm it up to normal operating temperature. 1. 2. Turn ignition switch OFF. Disconnect mass air flow sensor harness connector. 3. Restart engine and let it idle for at least 5 seconds. 4. 5. Stop engine and reconnect mass air flow sensor harness connector. Select Service \$03 with GST. Check that DTC P0102 is detected. 6. Select Service \$04 with GST to erase the DTC P0102. 7. >> END Н

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VIN REGISTRATION

< BASIC INSPECTION >

VIN REGISTRATION

Description

VIN Registration is an operation to register VIN in ECM. It must be performed each time ECM is replaced. (For details, refer to <u>EC-152</u>, <u>"Work Procedure"</u>.) **NOTE:**

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

Work Procedure

INFOID:000000012406332

1.CHECK VIN

Check the VIN of the vehicle and note it. Refer to GI-33, "Information About Identification or Model Code".

>> GO TO 2.

 $2. {\tt perform vin registration}$

With CONSULT

- 1. Turn ignition switch ON with engine stopped.
- 2. Select "VIN REGISTRATION" in "WORK SUPPORT" mode.
- 3. Follow the instructions on the CONSULT display.

>> END

INFOID:000000012406331

FUEL PRESSURE

< BASIC INSPECTION >

FUEL PRESSURE

Work Procedure	INFOID:000000012406333
FUEL PRESSURE RELEASE	E
 With CONSULT Turn ignition switch ON. Perform "FUEL PRESSURE RELEASE" in "WORK SUPPORT" mode with CONSULT. Start engine. After engine stalls, crank it 2 or 3 times to release all fuel pressure. Turn ignition switch OFF. 	-
 Without CONSULT Remove fuel pump fuse located in IPDM E/R. Start engine. After engine stalls, crank it 2 or 3 times to release all fuel pressure. Turn ignition switch OFF. Reinstall fuel pump fuse after servicing fuel system. 	
 FUEL PRESSURE CHECK CAUTION: Before disconnecting fuel line, release fuel pressure from fuel line to eliminate danger NOTE: Prepare pans or saucers under the disconnected fuel line because the fuel may sp pressure cannot be completely released because this models do not have fuel return Be careful not to scratch or get the fuel hose connection area dirty when servicing, s connector o-ring maintains seal ability. Use Fuel Pressure Gauge Kit [SST: — (J-44321)] and Fuel Pressure Adapter [SST: – check fuel pressure. 	bill out. The fuel n system. so that the quick
 Release fuel pressure to zero. Remove fuel hose using Quick Connector Release [SST: — (J-45488)]. Do not twist or kink fuel hose because it is plastic hose. Do not remove fuel hose (1) from quick connector. Keep fuel hose connections clean. 	
 3. Install Fuel Pressure Adapter [SST: — (J-44321-6)] (B) and Fuel Pressure Gauge kit [SST: — (J44321)] (A) as shown in figure. Do not distort or bend fuel rail tube when installing fuel pressure gauge adapter. When reconnecting fuel hose, check the original fuel hose for damage and abnormality. 	
4. Turn ignition switch ON (reactivate fuel pump) and check for fuel leakage.	
 Start engine and check for fuel leakage. Read the indication of fuel pressure gauge kit ISST – (I- 	
, by Read the indication of the dressure datable Kit 1881; — (1-1/ \times) \land \land \land \land	

- 6. Read the indication of fuel pressure gauge kit [SST: -- (J-44321)].
 - During fuel pressure check, check for fuel leakage from fuel connection every 3 minutes.

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

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- If OK, replace fuel pressure regulator. If NG, repair or replace malfunctioning part.
- 10. Before disconnecting Fuel Pressure Gauge kit [SST: (J-44321)] and Fuel Pressure Adapter [SST: (J-44321-6)], release fuel pressure to zero.

< BASIC INSPECTION >

HOW TO SET SRT CODE

Description

INFOID:000000012406334

[VQ35DE]

OUTLINE

In order to set all SRTs, the self-diagnoses as in the "SRT ITEM" table must have been performed at least once. Each diagnosis may require actual driving for a long period of time under various conditions.

SRT ITEM

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

SRT item ^{*1} (CONSULT indication)	Performance Priority ^{*2}	Required self-diagnostic items to set the SRT to "CMPLT"	Corresponding DTC No.
CATALYST	1	Three way catalyst function	P0420, P0430
EVAP SYSTEM	1	EVAP control system purge flow monitoring	P0441
		EVAP control system	P0456
HO2S	1	Air fuel ratio (A/F) sensor 1	P014C, P014D,P014E, P014F,P015A, P015B,P015C, P015D
		Heated oxygen sensor 2	P0137, P0157
		Heated oxygen sensor 2	P0138, P0158
		Heated oxygen sensor 2	P0139, P0159
EGR/VVT SYSTEM	2	Intake value timing control function	P0011, P0021, P052A, P052B, P052C, P052D

*1: Though displayed on the CONSULT screen, "HO2S HTR" is not SRT item.

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

SRT SERVICE PROCEDURE

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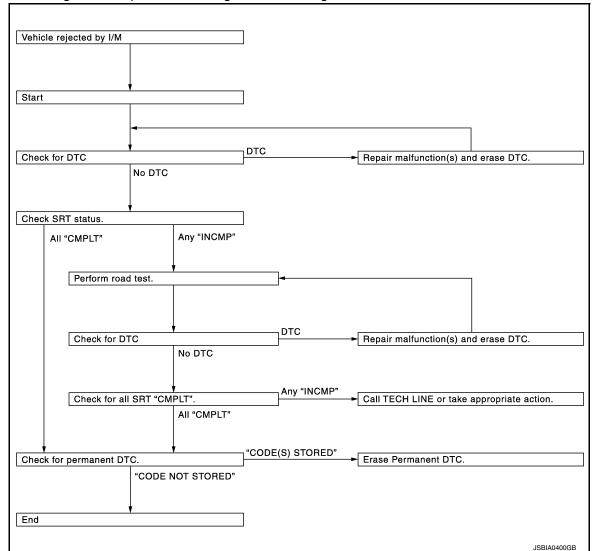
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If a vehicle has failed the state emissions inspection due to one or more SRT items indicating "INCMP", review the flowchart diagnostic sequence, referring to the following flowchart.



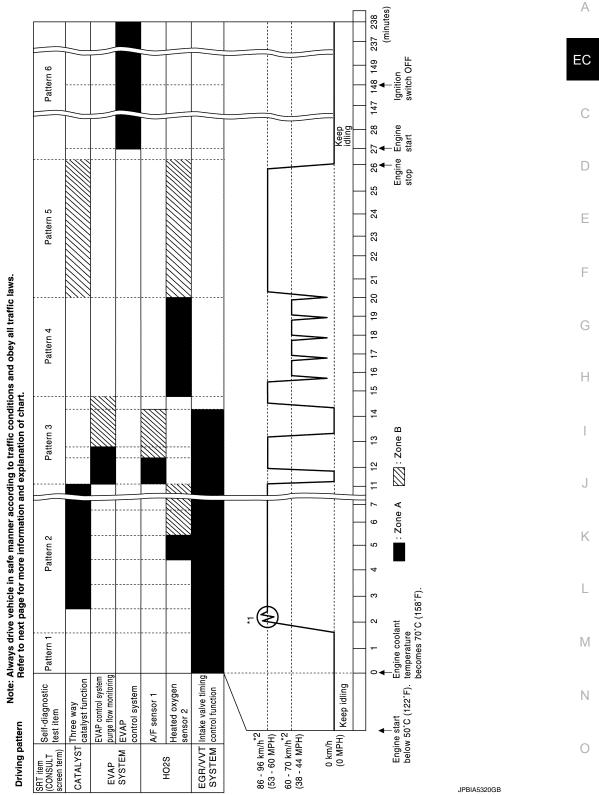
SRT Set Driving Pattern

CAUTION:

INFOID:000000012406335

< BASIC INSPECTION >

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



*1: Depress the accelerator pedal until vehicle speed is 90 km/h (56 MPH), then release the accelerator pedal and keep it released for more than 10 seconds. Depress the accelerator pedal until vehicle speed is 90 km/h (56 MPH) again.

- *2: Checking the vehicle speed with GST is advised.
- The time required for each diagnosis varies with road surface conditions, weather, altitude, individual driving habits, etc.
- "Zone A" is the fastest time where required for the diagnosis under normal conditions*. If the diagnosis is not completed within "Zone A", the diagnosis can still be performed within "Zone B".

< BASIC INSPECTION >

- *: Normal conditions
- Sea level
- Flat road
- Ambient air temperature: 20 30°C (68 86°F)

NOTE:

Diagnosis is performed as quickly as possible under normal conditions. However, under other conditions, diagnosis may also be performed. [For example: ambient air temperature other than $20 - 30^{\circ}$ C ($68 - 86^{\circ}$ F)]

Work Procedure

INFOID:000000012406336

1. СНЕСК DTC

Check DTC.

Is any DTC detected?

YES >> Repair malfunction(s) and erase DTC. Refer to <u>EC-103, "DTC Index"</u>.

NO >> GO TO 2.

2. CHECK SRT STATUS

With CONSULT

Select "SRT STATUS" in "DTC & SRT CONFIRMATION" mode with CONSULT.

Without CONSULT

Perform "SRT status" mode with EC-70, "On Board Diagnosis Function".

With GST

Select Service \$01 with GST.

Is SRT code(s) set?

YES >> GO TO 12.

NO-1 >> With CONSULT: GO TO 3.

NO-2 >> Without CONSULT: GO TO 4.

3. DTC CONFIRMATION PROCEDURE

1. Select "SRT WORK SUPPORT" in "DTC & SRT CONFIRMATION" mode with CONSULT.

 For SRT(s) that is not set, perform the corresponding "DTC CONFIRMATION PROCEDURE" according to the "Performance Priority" in the "SRT ITEM" table. Refer to <u>EC-155</u>, "<u>Description</u>".

3. Check DTC.

Is any DTC detected?

YES >> Repair malfunction(s) and erase DTC. Refer to EC-103. "DTC Index".

NO >> GO TO 11.

4.PERFORM ROAD TEST

• Check the "Performance Priority" in the "SRT ITEM" table. Refer to EC-155, "Description".

• Perform the most efficient SRT set driving pattern to set the SRT properly. Refer to <u>EC-156</u>, <u>"SRT Set Driv-ing Pattern"</u>.

In order to set all SRTs, the SRT set driving pattern must be performed at least once.

>> GO TO 5.

5.PATTERN 1

- 1. Check the vehicle condition;
- Engine coolant temperature is –10 to 35°C (14 to 95°F).
- Fuel tank temperature is more than 0°C (32°F).
- 2. Start the engine.
- 3. Keep engine idling until the engine coolant temperature is greater than 70°C (158°F)

NOTE:

ECM terminal voltage is follows;

- Engine coolant temperature
- −10 to 35°C (14 to 95°F): 3.0 − 4.3 V
- 70°(158°F): Less than 4.1 V
- Fuel tank temperature: Less than 1.4 V

Refer to EC-83, "Reference Value".

< BASIC INSPECTION >

А >> GO TO 6. 6.PATTERN 2 1. Drive the vehicle. And depress the accelerator pedal until vehicle speed is 90 km/h (56 MPH), then EC release the accelerator pedal and keep it released for more than 10 seconds. 2. Depress the accelerator pedal until vehicle speed is 90 km/h (56 MPH) again NOTE: Checking the vehicle speed with GST is advised. 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. D >> GO TO 7. 7_PATTERN 3 Ε · Operate vehicle following the driving pattern shown in the figure. Release the accelerator pedal during deceleration of vehicle speed 86 - 96 km/h from 90 km/h (56 MPH) to 0 km/h (0 MPH). (53 - 60 MPH) >> GO TO 8. 0 km/h (0 MPH) 30 S **1 MIN** 1 MIN Н PBIB2244E 8. PATTERN 4 · Operate vehicle, following the driving pattern shown in the figure. - Drive the vehicle in a proper gear at 60 km/h (38 MPH) and main-60 - 70 km/h tain the speed. (38 - 44 MPH) - Release the accelerator pedal fully at least 5 seconds. - Repeat the above two steps at least 5 times. >> GO TO 9. Κ 0 km/h (0 MPH) 1min 1min 1min i 1min i 1min 5sec 5sec 5sec 5sec 5se JSBIA0160GE M • The accelerator pedal must be held very steady during steady-state driving. If the accelerator pedal is moved, the test must be conducted again. Ν >> GO TO 10. 10.PATTERN 6 1. Start the engine and wait at least 2 hours. Turn ignition OFF and wait at least 90 minutes. 2. Ρ >> GO TO 11. 11.CHECK SRT STATUS With CONSULT Select "SRT STATUS" in "DTC & SRT CONFIRMATION" mode with CONSULT. Without CONSULT

Perform "SRT status" mode with EC-70, "On Board Diagnosis Function".

EC-159

[VQ35DE]

9. PATTERN 5

< BASIC INSPECTION >

With GST
 Select Service \$01 with GST.
 <u>Is SRT(s) set?</u>
 YES >> GO TO 12.
 NO >> Call TECH LINE or take appropriate action.
 12.CHECK PERMANENT DTC

NOTE:

Permanent DTC cannot be checked with a tool other than CONSULT or GST.

With CONSULT

Select "SRT STATUS" in "DTC & SRT CONFIRMATION" mode with CONSULT.

With GST

Select Service \$0A with GST.

Is permanent DTC(s) detected?

YES >> Proceed to <u>EC-161, "Description"</u>. NO >> END

< BASIC INSPECTION >

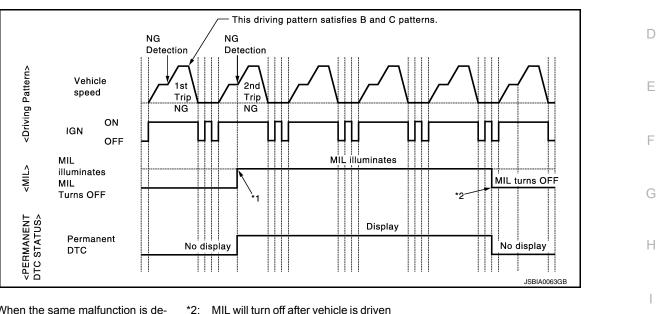
HOW TO ERASE PERMANENT DTC

Description

OUTLINE

When a DTC is stored in ECM

When a DTC is stored in ECM and MIL is ON, a permanent DTC is erased with MIL shutoff if the same malfunction is not detected after performing the driving pattern for MIL shutoff three times in a raw.



*1: When the same malfunction is detected in two consecutive trips, MIL will illuminate. MIL will turn off after vehicle is driven 3 times (driving pattern B) without any malfunctions.

When a DTC is not stored in ECM

The erasing method depends on a permanent DTC stored in ECM. Refer to the following table. **NOTE:**

If the applicable permanent DTC includes multiple groups, perform the procedure of Group B first. If the per-

	×: Applicable —: Not applicable				
0	Perform "DTC CONFIRMATION PROCEDURE"	[,] Driving pattern		Reference	L
Group [*]	for applicable DTCs.	В	D	Relefence	
A	×	_	_	EC-162, "Work Pro- cedure (Group A)"	M
В	_	×	×	EC-164, "Work Pro- cedure (Group B)"	N

*: For group, refer to EC-103, "DTC Index".

PERMANENT DTC ITEM

For permanent DTC items, MIL turns ON. Refer to EC-103, "DTC Index".

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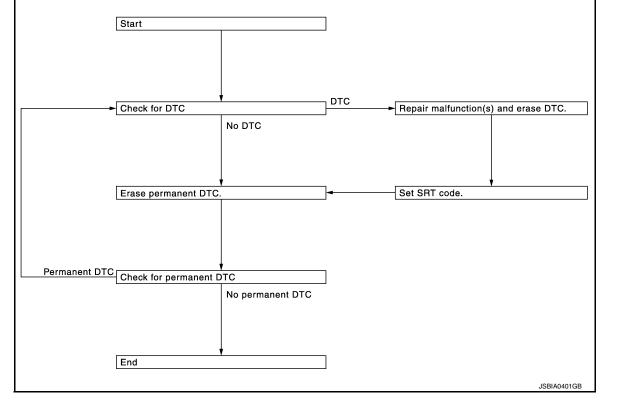
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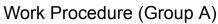
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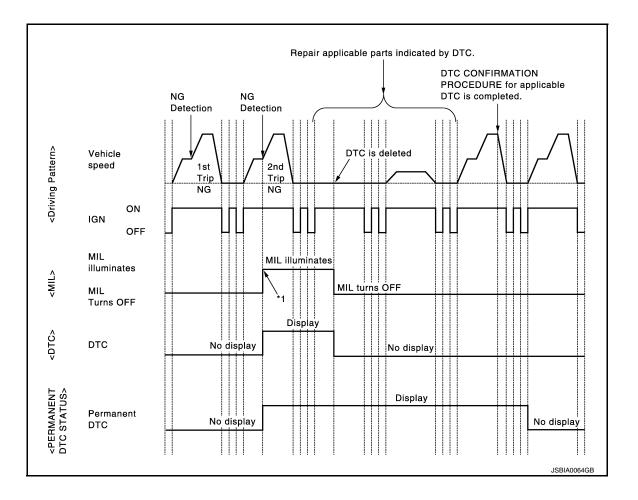
[VQ35DE]

PERMANENT DTC SERVICE PROCEDURE





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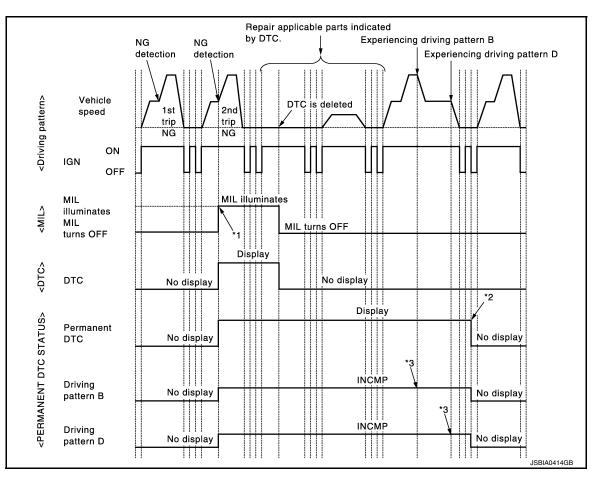
*1: When the same malfunction is de-А tected in two consecutive trips, MIL will illuminate. 1.CHECK DTC EC Check DTC. Is any DTC detected? YES >> Repair malfunction(s) and erase DTC. EC-70, "On Board Diagnosis Function" or EC-73, "CON-SULT Function". NO >> GO TO 2. D 2.CHECK PERMANENT DTC (P)With CONSULT Е 1. Turn ignition switch OFF and wait at least 10 seconds. 2. Turn ignition switch ON. 3. Turn ignition switch OFF and wait at least 10 seconds. 4. Turn ignition switch ON. Select "PERMANENT DTC STATUS" mode with CONSULT. 5. With GST Turn ignition switch OFF and wait at least 10 seconds. 1. 2. Turn ignition switch ON. 3. Turn ignition switch OFF and wait at least 10 seconds. 4. Turn ignition switch ON. Select Service \$0A with GST. 5. Н Is any permanent DTC detected? YES >> GO TO 3. NO >> END **3.** PERFORM DTC CONFIRMATION PROCEDURE Perform "DTC CONFIRMATION PROCEDURE" for DTCs which are the same as permanent DTCs stored in J ECM. Refer to EC-103, "DTC Index". >> GO TO 4. Κ 4.CHECK PERMANENT DTC With CONSULT 1. L Turn ignition switch OFF and wait at least 10 seconds. 2. Turn ignition switch ON. Turn ignition switch OFF and wait at least 10 seconds. 3. 4. Turn ignition switch ON. M 5. Select "PERMANENT DTC STATUS" mode with CONSULT. With GST 1. Turn ignition switch OFF and wait at least 10 seconds. Ν 2. Turn ignition switch ON. 3. Turn ignition switch OFF and wait at least 10 seconds. Turn ignition switch ON. 4. 5. Select Service \$0A with GST. Ο Is any permanent DTC detected? YES >> GO TO 1. NO >> END Ρ

[VQ35DE]

< BASIC INSPECTION >

Work Procedure (Group B)

[VQ35DE]



- *1: When the same malfunction is detected in two consecutive trips, MIL will illuminate.
- *2: After experiencing driving pattern B *3: and D, permanent DTC is erased.

Indication does not change unless the ignition switch is turned from ON to OFF twice even after experiencing driving pattern B or D.

NOTE:

Drive the vehicle according to only driving patterns indicating "INCMP" in driving patterns B and D on the "PERMANENT DTC STATUS" screen.

1.CHECK DTC

Check DTC.

Is any DTC detected?

YES >> Repair malfunction(s) and erase DTC. Refer to <u>EC-70, "On Board Diagnosis Function"</u> or <u>EC-73,</u> <u>"CONSULT Function"</u>.

NO >> GO TO 2.

2. CHECK PERMANENT DTC

With CONSULT

- Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.
- 4. Turn ignition switch ON.
- 5. Select "PERMANENT DTC STATUS" mode with CONSULT.

With GST

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

< BASIC INSPECTION > [VQ35DE]	
 Turn ignition switch ON. Select Service \$0A with GST. 	А
Is any permanent DTC detected?	
YES >> GO TO 3. NO >> END	EC
3. DRIVE DRIVING PATTERN B	EC
CAUTION:	С
 Always drive at a safe speed. Never erase self-diagnosis results. 	0
• If self-diagnosis results are erased during the trip of driving pattern B or D, the counter of driving	_
pattern B and D is reset. ()With CONSULT	D
 Start engine and warm it up to normal operating temperature. Use "PERMANENT DTC WORK SUPPORT" mode with CONSULT to drive the vehicle according to driving pattern B. Refer to <u>EC-73</u>. "CONSULT Function", <u>EC-67</u>. "DIAGNOSIS DESCRIPTION : Driving Pat- 	E
<u>tern"</u> . ^(a) With GST	
 Start engine and warm it up to normal operating temperature. Drive the vehicle according to driving pattern B. Refer to <u>EC-67, "DIAGNOSIS DESCRIPTION : Driving</u> 	F
Pattern".	G
>> GO TO 4.	-
4.CHECK PERMANENT DTC	Н
 With CONSULT Turn ignition switch OFF and wait at least 10 seconds. 	
 Turn ignition switch OFF and wait at least 10 seconds. Turn ignition switch ON. 	1
3. Turn ignition switch OFF and wait at least 10 seconds.	
 Turn ignition switch ON. Select "PERMANENT DTC STATUS" mode with CONSULT. 	
With GST	J
 Turn ignition switch OFF and wait at least 10 seconds. Turn ignition switch ON. 	
3. Turn ignition switch OFF and wait at least 10 seconds.	Κ
 Turn ignition switch ON. Select Service \$0A with GST. 	
Is any permanent DTC detected?	I
YES >> GO TO 5.	
NO >> END	
5. DRIVE DRIVING PATTERN D	M
CAUTION:	
 Always drive at a safe speed. Never erase self-diagnosis results. 	Ν
• If self-diagnosis results are erased during the trip of driving pattern B or D, the counter of driving	
 pattern B and D is reset. Drive the vehicle according to driving pattern D. Refer to <u>EC-67, "DIAGNOSIS DESCRIPTION : Driving Pattern"</u>. 	0
>> GO TO 6.	_
6. CHECK PERMANENT DTC	Ρ

- With CONSULT1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON. 4.

< BASIC INSPECTION >

- Select "PERMANENT DTC STATUS" mode with CONSULT. 5.
- With GST1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds. 3.
- 4. Turn ignition switch ON.
- 5. Select Service \$0A with GST.
- Is any permanent DTC detected?
- YES >> GO TO 1.
- NO >> END

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< DTC/CIRCUIT DIAGNOSIS >

DTC/CIRCUIT DIAGNOSIS TROUBLE DIAGNOSIS - SPECIFICATION VALUE

Description

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

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

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

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

Component Function Check

1.START

Check that all of the following conditions are satisfied.

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

>> GO TO 2.

2.PERFORM "SPEC" OF "DATA MONITOR" MODE

NOTE:

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

- 1. Perform "EC-141, "Work Procedure".
- Select "B/FUEL SCHDL", "A/F ALPHA-B1", "A/F ALPHA-B2" and "MASS AIR FLOW SENSOR (Hz)" in "SPEC" of "DATA MONITOR" mode with CONSULT.

EC-167

3. Check that monitor items are within the SP value.

Is the measurement value within the SP value?

- YES >> INSPECTION END
- NO >> Proceed to <u>EC-168, "Diagnosis Procedure"</u>.

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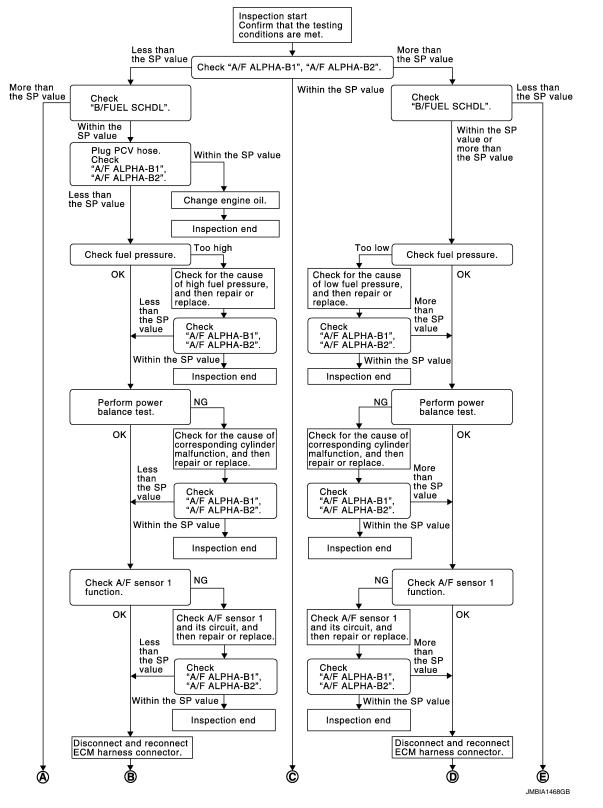
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< DTC/CIRCUIT DIAGNOSIS >

Diagnosis Procedure

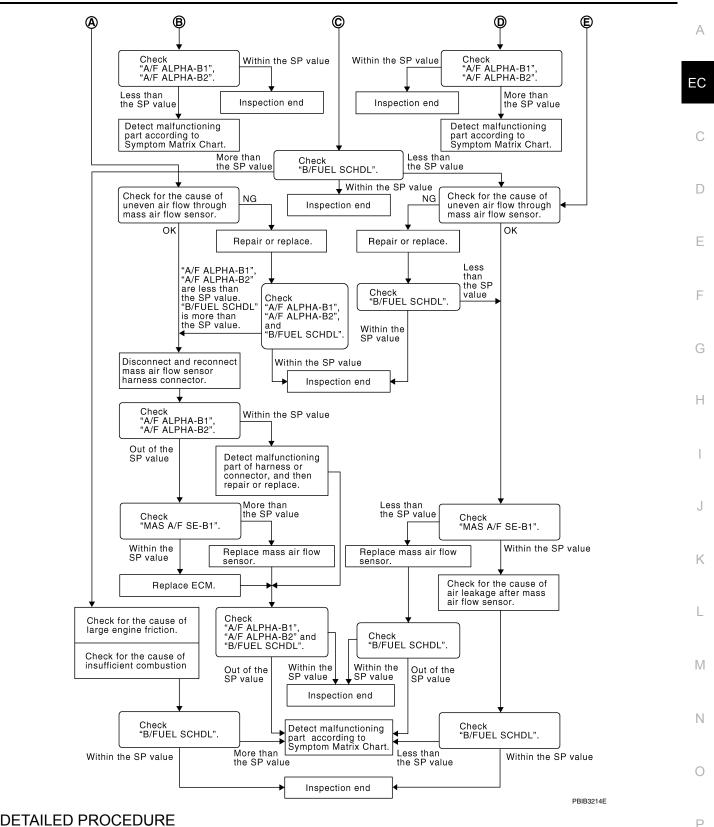
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OVERALL SEQUENCE



< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]



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

(B) With CONSULT

- 1. Start engine.
- 2. Confirm that the testing conditions are met. Refer to EC-167, "Component Function Check".
- 3. Select "A/F ALPHA-B1", "A/F ALPHA-B2" in "SPEC" of "DATA MONITOR" mode, and check that each indication is within the SP value.

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EC-169

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< DTC/CIRCUIT DIAGNOSIS >

NOTE:

Check "A/F ALPHA-B1", "A/F ALPHA-B2" for approximately 1 minute because they may fluctuate. It is NG if the indication is out of the SP value even a little.

Is the measurement value within the SP value?

- YES >> GO TO 17.
- NO-1 >> Less than the SP value: GO TO 2.
- NO-2 >> More than the SP value: GO TO 3.

2.CHECK "B/FUEL SCHDL"

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

Is the measurement value within the SP value?

YES >> GO TO 4.

NO >> More than the SP value: GO TO 19.

3.CHECK "B/FUEL SCHDL"

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

Is the measurement value within the SP value?

YES >> GO TO 6.

NO-1 >> More than the SP value: GO TO 6.

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

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

- 1. Stop the engine.
- 2. Disconnect PCV hose, and then plug it.
- 3. Start engine.
- 4. Select "A/F ALPHA-B1", "A/F ALPHA-B2" in "SPEC" of "DATA MONITOR" mode, and check that each indication is within the SP value.

Is the measurement value within the SP value?

YES >> GO TO 5.

NO >> GO TO 6.

5.CHANGE ENGINE OIL

- 1. Stop the engine.
- 2. Change engine oil.

NOTE:

This symptom may occur when a large amount of gasoline is mixed with engine oil because of driving conditions (such as when engine oil temperature does not rise enough since a journey distance is too short during winter). The symptom will not be detected after changing engine oil or changing driving conditions.

>> INSPECTION END

6.CHECK FUEL PRESSURE

Check fuel pressure. (Refer to EC-153, "Work Procedure".)

Is the inspection result normal?

YES >> GO TO 9.

NO-1 >> Fuel pressure is too high: Replace "fuel filter and fuel pump assembly", refer to <u>FL-6</u>, "<u>Exploded</u> <u>View</u>", and then GO TO 8.

NO-2 >> Fuel pressure is too low: GO TO 7.

1.DETECT MALFUNCTIONING PART

Check fuel hoses and fuel tubes for clogging.

Is the inspection result normal?

YES >> Replace "fuel filter and fuel pump assembly", refer to <u>FL-6. "Exploded View"</u>, and then GO TO 8.

NO >> Repair or replace malfunctioning part and then GO TO 8.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

< DTC/CIRCUIT DIAGNOSIS >	
8. CHECK "A/F ALPHA-B1", "A/F ALPHA-B2"	
 Start engine. Select "A/F ALPHA-B1", "A/F ALPHA-B2" in "SPEC" of "DATA MONITOR" mode, and indication is within the SP value. 	check that each
<u>Is the measurement value within the SP value?</u> YES >> INSPECTION END NO >> GO TO 9.	
9.PERFORM POWER BALANCE TEST	
 Perform "POWER BALANCE" in "ACTIVE TEST" mode. Check that the each cylinder produces a momentary engine speed drop. 	
<u>Is the inspection result normal?</u> YES >> GO TO 12.	
NO >> GO TO 10.	
10.DETECT MALFUNCTIONING PART	
 Check the following below. Ignition coil and its circuit (Refer to <u>EC-484</u>, "<u>Component Function Check</u>".) Fuel injector and its circuit (Refer to <u>EC-479</u>, "<u>Component Function Check</u>".) 	
 Intake air leakage Low compression pressure (Refer to <u>EM-24, "Inspection"</u>.) 	
<u>Is the inspection result normal?</u> YES >> Replace fuel injector, refer to EM-49, "Exploded View", and then GO TO 11.	
YES >> Replace fuel injector, refer to <u>EM-49, "Exploded View"</u> , and then GO TO 11. >> Repair or replace malfunctioning part and then GO TO 11.	
11. CHECK "A/F ALPHA-B1", "A/F ALPHA-B2"	
 Start engine. Select "A/F ALPHA-B1", "A/F ALPHA-B2" in "SPEC" of "DATA MONITOR" mode, and indication is within the SP value. 	check that each
Is the measurement value within the SP value?	
YES >> INSPECTION END NO >> GO TO 12.	
12. CHECK A/F SENSOR 1 FUNCTION	
Perform all DTC CONFIRMATION PROCEDURE related with A/F sensor 1.	
 For DTC P0130, P0150, refer to <u>EC-229, "DTC Logic"</u>. For DTC P0131, P0151, refer to <u>EC-233, "DTC Logic"</u>. 	
 For DTC P0132, P0152, refer to <u>EC-236, "DTC Logic"</u>. For DTC P014C, P014D, P014E, P014F, refer to <u>EC-261, "DTC Logic"</u>. 	
• For DTC P2096, P2097, P2098, P2099, refer to $EC-437$, "DTC Logic".	
Are any DTCs detected?	
YES >> GO TO 15. NO >> GO TO 13.	
13.CHECK A/F SENSOR 1 CIRCUIT	
Perform Diagnostic Procedure according to corresponding DTC.	
>> GO TO 14.	
14. CHECK "A/F ALPHA-B1", "A/F ALPHA-B2"	
1. Start engine.	
2. Select "Ă/F ALPHA-B1", "A/F ALPHA-B2" in "SPEC" of "DATA MONITOR" mode, and indication is within the SP value.	check that each
Is the measurement value within the SP value?	
YES >> INSPECTION END NO >> GO TO 15.	

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15. DISCONNECT AND RECONNECT ECM HARNESS CONNECTOR

- 1. Stop the engine.
- 2. Disconnect ECM harness connector. Check pin terminal and connector for damage, and then reconnect it.

>> GO TO 16.

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

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

Is the measurement value within the SP value?

- YES >> INSPECTION END
- NO >> Detect malfunctioning part according to <u>EC-503. "Symptom Table"</u>.
- **17.**CHECK "B/FUEL SCHDL"

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

Is the measurement value within the SP value?

- YES >> INSPECTION END
- NO-1 >> More than the SP value: GO TO 18.
- NO-2 >> Less than the SP value: GO TO 25.

18. DETECT MALFUNCTIONING PART

- 1. Check for the cause of large engine friction. Refer to the following.
- Engine oil level is too high
- Engine oil viscosity
- Belt tension of power steering, alternator, A/C compressor, etc. is excessive
- Noise from engine
- Noise from transmission, etc.
- 2. Check for the cause of insufficient combustion. Refer to the following.
- Valve clearance malfunction
- Intake valve timing control function malfunction
- Camshaft sprocket installation malfunction, etc.

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

19.CHECK INTAKE SYSTEM

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

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

Is the inspection result normal?

YES >> GO TO 21.

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

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

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

Is the measurement value within the SP value?

- YES >> INSPECTION END
- NO >> "B/FUEL SCHDL" is more, "A/F ALPHA-B1", "A/F ALPHA-B2" are less than the SP value: GO TO 21.

21. DISCONNECT AND RECONNECT MASS AIR FLOW SENSOR HARNESS CONNECTOR

1. Stop the engine.

< DTC/CIRCUIT DIAGNOSIS > [VQ35DE]
2. Disconnect mass air flow sensor harness connector. Check pin terminal and connector for damage and then reconnect it again.
>> GO TO 22.
22.CHECK "A/F ALPHA-B1", "A/F ALPHA-B2"
 Start engine. Select "A/F ALPHA-B1", "A/F ALPHA-B2" in "SPEC" of "DATA MONITOR" mode, and check that each indication is within the SP value.
<u>Is the measurement value within the SP value?</u> YES >> Detect malfunctioning part of mass air flow sensor circuit and repair it. Refer to <u>EC-206. "Diagno-</u> <u>sis Procedure"</u> . Then GO TO 29. NO >> GO TO 23.
23. CHECK "MASS AIR FLOW SENSOR (HZ)"
Select "MASS AIR FLOW SENSOR (Hz)" in "SPEC" of "DATA MONITOR" mode, and check that the indication is within the SP value.
<u>Is the measurement value within the SP value?</u> YES >> GO TO 24.
NO >> More than the SP value: Replace mass air flow sensor, refer to <u>EM-27, "Exploded View"</u> , and then GO TO 29.
24.REPLACE ECM
 Replace ECM. Refer to <u>EC-145</u>, "<u>Description</u>".
>> GO TO 29.
25. CHECK INTAKE SYSTEM
Check for the cause of uneven air flow through mass air flow sensor. Refer to the following. • Crushed air ducts
Malfunctioning seal in air cleaner element
 Uneven dirt in air cleaner element Improper specification in intake air system
Is the inspection result normal?
YES >> GO TO 27. NO >> Repair or replace malfunctioning part, and then GO TO 26.
26. CHECK "B/FUEL SCHDL"
Select "B/FUEL SCHDL" in "SPEC" of "DATA MONITOR" mode, and check that the indication is within the SP value.
Is the measurement value within the SP value?
YES >> INSPECTION END NO >> Less than the SP value: GO TO 27.
27. CHECK "MASS AIR FLOW SENSOR (HZ)"
Select "MASS AIR FLOW SENSOR (Hz)" in "SPEC" of "DATA MONITOR" mode, and check that the indication is within the SP value.
Is the measurement value within the SP value?
YES >> GO TO 28. NO >> Less than the SP value: Replace mass air flow sensor, refer to <u>EM-27, "Exploded View"</u> ,and then GO TO 30.
28. CHECK INTAKE SYSTEM
Check for the cause of air leakage after the mass air flow sensor. Refer to the following.

- Disconnection, looseness, and cracks in air duct
 Looseness of oil filler cap
- Disconnection of oil level gauge

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- Open stuck, breakage, hose disconnection, or cracks in PCV valve
- Disconnection or cracks in EVAP purge hose, stuck open EVAP canister purge volume control solenoid valve
- Malfunctioning seal in rocker cover gasket
- Disconnection, looseness, or cracks in hoses, such as a vacuum hose, connecting to intake air system parts
- Malfunctioning seal in intake air system, etc.

>> GO TO 30.

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

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

Is the measurement value within the SP value?

- YES >> INSPECTION END
- NO >> Detect malfunctioning part according to <u>EC-503</u>, "Symptom Table".

30.CHECK "B/FUEL SCHDL"

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

Is the measurement value within the SP value?

YES >> INSPECTION END

NO >> Detect malfunctioning part according to EC-503. "Symptom Table".

< DTC/CIRCUIT DIAGNOSIS >

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

1.CHECK FUSE

Check that the following fuse is not blowing.

Location	Fuse No.	Capacity
IPDM E/R	#44	10 A
	#50	15 A

Is the fuse blown (open)?

YES NO	 >> Replace the fuse after repairing the applicable circuit. (If the replaced fuse is blown again, check the power supply circuit upstream of IPDM E/R.) >> GO TO 2. 	E
2.сне	ECK GROUND CONNECTION	
	rn ignition switch OFF. eck ground connection E38. Refer to <u>GI-44, "Circuit Inspection"</u> .	F
<u>Is the ir</u>	nspection result normal?	
YES	>> GO TO 3.	G
NO	>> Repair or replace ground connection.	

3.CHECK ECM GROUND CIRCUIT

1. Disconnect ECM harness connectors.

2. Check the continuity between ECM harness connector and ground.

+	÷		
EC	M	_	Continuity
Connector	Terminal		
	147		
E19	149	_	
-	152	_	
F14	10	Ground	Existed
Г 14	55	_	
F15	105		
FID	110		

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4. CHECK ECM POWER SUPPLY (MAIN)-I

1. Reconnect ECM harness connector.

2. Turn ignition switch ON.

3. Check the voltage between ECM harness connector terminals.

	ECM		
Connector	+	_	Voltage
Connector	Terr	ninal	
E19	145	152	Battery voltage

Is the inspection result normal?

YES >> GO TO 5.

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NO >> GO TO 6.

5. CHECK ECM POWER SUPPLY (MAIN)-II

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

	ECM				
Connector	+	_	Condition	Voltage (Approx.)	
Connector	Terminal			(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
E19	145	152	After turning ignition switch OFF, battery voltage will ex- ist for a few seconds	Drop to 0 V	

Is the inspection result normal?

YES >> GO TO 9.

NO >> GO TO 7.

6. Check ECM POWER SUPPLY (MAIN) CIRCUIT

1. Turn ignition switch OFF.

2. Disconnect ECM harness connectors.

3. Disconnect IPDM E/R harness connector.

4. Check the continuity between ECM harness connector and IPDM E/R harness connector.

+				
E	СМ	IPDN	/I E/R	Continuity
Connector	Terminal	Connector	Terminal	
E19	145	E10	10	Existed

5. Also check harness for short to ground.

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit.

NO >> Repair or replace error-detected parts.

7. CHECK ECM RELAY CONTROL SIGNAL

Check the voltage between ECM harness connector terminals as per the following.

	E	CM		Vallage	
	+ –		Condition	Voltage (Approx.)	
Connector	Terminal	Connector	Terminal		
				Ignition switch ON	0 V
F15	86	E19	152	Turn ignition switch OFF and wait at least 10 sec- onds.	Battery voltage

Is the inspection result normal?

YES >> Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u>.

NO >> GO TO 8.

8. CHECK ECM RELAY CONTROL SIGNAL CIRCUIT

1. Turn ignition switch OFF.

2. Disconnect ECM harness connector.

3. Disconnect IPDM E/R harness connector.

4. Check the continuity between ECM harness connector and IPDM E/R harness connector.

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F	+ CM	IDU	/IE/R	Continuity			
nector	Terminal	Connector	Terminal				
15	86	F12	69	Existed			
spec >> CK I i igr ck ti tor	Ction result n Replace IPE Repair or re GNITION SV ition switch he voltage b ECM + Terr 133 Ction result n GO TO 11. GO TO 10.	OM E/R. Refe place error-d NITCH SIGN ON. etween ECN 	er to <u>PCS-34</u> etected part IAL I harness co Con Ignition switch	. "Removal a s. nnector term dition n OFF n ON	inals. Voltage (Approx.) 0 V Battery voltage	· · · · · · · · · · · · · · · · · · ·	
	K IGNITION	SWITCH SIG	SNAL CIRCU				
ECł ign onn onn	ition switch lect ECM ha lect IPDM E/	OFF. rness conne R harness c	ctor. onnector.		nd IPDM E/R ha	rness connecto	or.
HECH rn igr sconn sconn sconn ieck t	ition switch lect ECM ha lect IPDM E/	OFF. rness conne R harness c	ctor. onnector.		ld IPDM E/R ha	rness connecto	or.
ECP ign conn ck t	ition switch lect ECM ha lect IPDM E/ he continuity	OFF. rness conne R harness c between EC	ctor. onnector.		nd IPDM E/R ha	rness connecto	or.
ECH ign conn conn ck t	ition switch lect ECM ha lect IPDM E/ he continuity + CM Terminal	OFF. rness conne R harness c between EC IPDM Connector	ctor. onnector. CM harness of - M E/R Terminal	connector ar Continuity	ld IPDM E/R ha	rness connecto	or.
HECH n igr conn eck t Ec ctor	ition switch lect ECM ha lect IPDM E/ he continuity + CM Terminal 133	OFF. rness conne R harness c between EC	ctor. onnector. CM harness - / E/R Terminal 19	Connector ar Continuity Existed	ld IPDM E/R ha	rness connecto	or.
CHECH urn ign sconn sconn heck ti ector 19 so che inspec >> chECH	ition switch lect ECM ha lect IPDM E/ he continuity + CM Terminal 133 eck harness <u>ction result n</u> Perform the Repair or re K ECM POW oltage betwe	OFF. rness conne R harness c between EC IPDM Connector E10 for short to g ormal? trouble diag place error-d ER SUPPLY een ECM har	ctor. onnector. CM harness // E/R Terminal 19 ground and to nosis for pov etected part (BACK-UP)	Connector ar Continuity Existed D power. ver supply ci s.	rcuit.	rness connecto	:or.
CHECH urn ign isconn sconn heck ti nector 19 so che inspec >> SO che inspec >> SHECH	ition switch lect ECM ha lect IPDM E/ he continuity + CM Terminal 133 eck harness <u>ction result n</u> Perform the Repair or re K ECM POW oltage betwe	OFF. rness conne R harness c between EC IPDN Connector E10 for short to g ormal? trouble diag place error-d ER SUPPLY	ctor. onnector. CM harness // E/R Terminal 19 ground and to nosis for pov etected part (BACK-UP)	Continuity Continuity Existed D power. ver supply ci s. ctor terminals	rcuit.	rness connecto	:or.
IECH n igr conn conn eck ti Ectr >> ctor >> che spec >> che >> che > che >> che > che >> che >> che > che >> che >> che >> che >> che > che >> che >> che > che che che che che che che che che che	ition switch i lect ECM ha lect IPDM E/ he continuity + CM Terminal 133 eck harness ction result n Perform the Repair or re K ECM POW oltage betwe	OFF. rness conne R harness c between EC IPDM Connector E10 for short to g ormal? trouble diag place error-d ER SUPPLY een ECM har	ctor. onnector. CM harness // E/R Terminal 19 ground and to nosis for pov etected part (BACK-UP)	Continuity Continuity Existed D power. ver supply ci s. ctor terminals	rcuit.	rness connecto	:or.
ECH igr conn ck ti tor ECH ne vo	ition switch lect ECM ha lect IPDM E/ he continuity + CM Terminal 133 eck harness ction result n Perform the Repair or re (ECM POW oltage betwee	OFF. rness conne R harness c between EC IPDM Connector E10 for short to g ormal? trouble diag place error-d ER SUPPLY een ECM har	ctor. onnector. CM harness 	Continuity Continuity Existed D power. ver supply ci s. ctor terminals	rcuit.	rness connecto	or.

< DTC/CIRCUIT DIAGNOSIS >

4. Check the continuity between ECM harness connector and IPDM E/R harness connector.

	+			
E	СМ	IPDN	ME/R	Continuity
Connector	Terminal	Connector	Terminal	
F15	116	F12	55	Existed

5. Also check harness for short to ground.

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit.

NO >> Repair or replace error-detected parts.

< DTC/CIRCUIT DIAGNOSIS >

U0101 CAN COMM CIRCUIT

Description

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

DTC Logic

INFOID:000000012406345 D

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
U0101	Lost communication with TCM	When ECM is not transmitting or receiving CAN communication signal of OBD (emission-related diagnosis) with TCM for 2 seconds or more.	 CAN communication line between TCM and ECM CAN communication line open or shorted
DTC CON	FIRMATION PROC	EDURE	
1.PERFO	RM DTC CONFIRMA	TION PROCEDURE	
2. Check	DTC.	wait at least 3 seconds.	
		"Diagnosis Procedure".	
Diagnosi	is Procedure		INFOID:00000001240634
Perform the Chart".	e trouble diagnosis fo	or CAN communication system. Refer to	LAN-17, "Trouble Diagnosis Flow

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U1000 CAN COMM CIRCUIT

Description

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

DTC Logic

INFOID:000000012406348

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
U1000	CAN communication line	When ECM is not transmitting or receiving CAN com- munication signal of OBD (emission related diagno- sis) for 2 seconds or more.	 Harness or connectors (CAN communication line is open or shorted)

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 3 seconds.

2. Check DTC.

Is DTC detected?

YES >> Proceed to <u>EC-180. "Diagnosis Procedure"</u>. NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000012406349

Perform the trouble diagnosis for CAN communication system. Refer to <u>LAN-17, "Trouble Diagnosis Flow</u> <u>Chart"</u>.

INFOID:000000012406347

P0011, P0021 IVT CONTROL

< DTC/CIRCUIT DIAGNOSIS >

P0011, P0021 IVT CONTROL

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P0011 or P0021 is displayed with DTC P0075 or P0081, first perform the trouble diagnosis for DTC P0075, P0081. Refer to <u>EC-196, "DTC Logic"</u>.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0011 P0021	Intake valve timing control performance (bank 1) Intake valve timing control performance (bank 2)	There is a gap between angle of target and phase-control angle degree.	 Crankshaft position sensor (POS) Camshaft position sensor (PHASE) Intake valve timing control solenoid valve Accumulation of debris to the signal pick-up portion of the camshaft Timing chain installation Foreign matter caught in the oil groove for intake valve timing control
	NFIRMATION PRO	OCEDURE	
2. Turn i 3. Turn i TESTING	gnition switch OFF gnition switch ON. gnition switch OFF CONDITION:	and wait at least 10 seconds. and wait at least 10 seconds. Dwing procedure, confirm that batter	y voltage is between 10 V and 16 V at
-	> GO TO 2. DRM DTC CONFIR	MATION PROCEDURE-I	
 Start of Maint 	gnition switch ON a engine and warm it	and select "DATA MONITOR" mode with up to the normal operating temperature nditions for at least 6 consecutive secor	
ENG SPE	ED 1,200 -	- 2,000 rpm	
COOLAN ⁻		han 60°C (140°F)	-
B/FUEL SO	CHDL More t	han 7.3 msec	-
Selector le	ver D posi	tion	-
4. Stop 5. Checl	ys drive at a safe s vehicle with engine < 1st trip DTC. ST	running and let engine idle for 10 secor	nds.
	e procedure "With C	CONSULT" above.	
YES >	DTC detected? > Proceed to <u>EC-1</u> > GO TO 3.	82. "Diagnosis Procedure"	
3.PERFO	ORM DTC CONFIR	MATION PROCEDURE-II	

3.PERFORM DTC CONFIRMATION PROCEDURE-II

With CONSULT

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P0011, P0021 IVT CONTROL

< DTC/CIRCUIT DIAGNOSIS >

1. Maintain the following conditions for at least 20 consecutive seconds.

ENG SPEED	1,400 - 3,175 rpm (A constant rotation is maintained.)
COOLAN TEMP/S	More than 60°C (140°F)
Selector lever	1st or 2nd position
Driving location uphill	Driving vehicle uphill (Increased engine load will help maintain the driving conditions re- quired for this test.)

CAUTION:

Always drive at a safe speed. 2. Check 1st trip DTC. With GST Follow the procedure "With CONSULT" above. Is 1st trip DTC detected? VES

YES >> Proceed to <u>EC-182</u>, "Diagnosis Procedure" NO >> INSPECTION END

Diagnosis Procedure

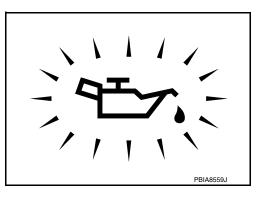
1.CHECK OIL PRESSURE WARNING LAMP

- 1. Start engine.
- 2. Check oil pressure warning lamp and confirm it is not illuminated.

Is oil pressure warming lamp illuminated?

YES >> Check the engine oil level. Refer to <u>LU-8, "Inspection"</u>.

NO >> GO TO 2.



2.CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE

Check intake valve timing control solenoid valve. Refer to <u>EC-183</u>, "Component Inspection". <u>Is the inspection result normal?</u>

YES >> GO TO 3.

NO >> Replace malfunctioning intake valve timing control solenoid valve. Refer to <u>EM-68</u>, "<u>Exploded</u> <u>View</u>".

3. CHECK CRANKSHAFT POSITION SENSOR (POS)

Check crankshaft position sensor (POS). Refer to EC-299, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace crankshaft position sensor (POS). Refer to <u>EM-39</u>, "Exploded View".

4.CHECK CAMSHAFT POSITION SENSOR (PHASE)

Check camshaft position sensor (PHASE). Refer to EC-303, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace malfunctioning camshaft position sensor (PHASE). Refer to EM-54, "Exploded View".

5.CHECK CAMSHAFT (INTAKE)

Check the following.

INFOID:000000012406351

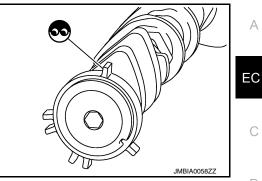
P0011, P0021 IVT CONTROL

< DTC/CIRCUIT DIAGNOSIS >

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

Is the inspection result normal?

YES >> GO TO 6. NO >> Remove debris and clean the signal plate of camshaft rear end or replace camshaft. Refer to <u>EM-87</u>, <u>"Exploded View"</u>.



6.CHECK TIMINO	G CHAIN INSTALLATION
Check service rec	ords for any recent repairs that may cause timing chain misalignment.
Are there any serv	vice records that may cause timing chain misalignment?
YES >> Check NO >> GO To	k timing chain installation. Refer to <u>EM-85, "Inspection"</u> . O 7.
7.CHECK LUBRI	ICATION CIRCUIT
Check lubrication	circuit. Refer to EM-91, "Inspection".
Is the inspection re	
	k intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u> . I lubrication line.
Component In	spection
1.CHECK INTAK	E VALVE TIMING CONTROL SOLENOID VALVE-I
	take valve timing control solenoid valve harness connector. nce between intake valve timing control solenoid valve terminals as per the following.
Terminals	Resistance
1 and 2	7.0 - 7.8 Ω [at 20°C (68°F)]
1 or 2 and ground	$\infty \Omega$ (Continuity should not exist)
Is the inspection re	esult normal?
YES >> GO To NO >> Repla <u>View</u> "	ice malfunctioning intake valve timing control solenoid valve. Refer to EM-68, "Exploded
2. CHECK INTAK	E VALVE TIMING CONTROL SOLENOID VALVE-II
1. Remove intak	e valve timing control solenoid valve. Refer to EM-68, "Exploded View".
	DC between intake valve timing control solenoid Is 1 and 2, and then interrupt it. Check that the
	s as shown in the figure.
CAUTION:	
	12 V DC continuously for 5 seconds or more. ay result in damage to the coil in intake valve
timing contro	ol solenoid valve.
NOTE:	ace O-ring when intake valve timing control
	ve is removed.
Is the inspection re	esult normal?
	ECTION END
	nce malfunctioning intake value timing control colonoid value. Pofer to EM 68. "Exploded

NO >> Replace malfunctioning intake valve timing control solenoid valve. Refer to <u>EM-68</u>, "<u>Exploded</u> <u>View</u>".

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< DTC/CIRCUIT DIAGNOSIS >

P0014, P0024 EVT CONTROL

DTC Description

[VQ35DE]

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0014	EXH/V TIM CONT-B1 [Exhaust valve timing control performance (bank 1)]	There is a gap between angle of target and phase central angle degree
P0024	EXH/V TIM CONT-B2 [Exhaust valve timing control performance (bank 2)]	 There is a gap between angle of target and phase-control angle degree.

POSSIBLE CAUSE

- · Crankshaft position sensor
- Camshaft position sensor
- Exhaust valve timing control position sensor
- · Exhaust valve timing control solenoid valve
- Accumulation of debris to the signal pick-up portion of the camshaft
- Timing chain installation
- · Foreign matter caught in the oil groove for exhaust valve timing control

TESTING CONDITION:

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

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0014 or P0024 is displayed with DTC P0078, P0084, P1078, or P1084, first perform the confirmation procedure (trouble diagnosis) for DTC P0078, P0084, P1078, or P1084.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable.
 - DTC P0078: Refer to <u>EC-198</u>, "DTC Description".
 - DTC P0084: Refer to EC-198. "DTC Description".
 - DTC P1078: Refer to EC-384, "DTC Description".
 - DTC P1084: Refer to <u>EC-384, "DTC Description"</u>.

NO >> GO TO 2.

2. PRECONDITIONING

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

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

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

TESTING CONDITION:

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

>> GO TO 3.

3. PERFORM DTC CONFIRMATION PROCEDURE - 1

With CONSULT

- 1. Turn the ignition switch ON and select "DATA MONITOR" mode of "ENGINE" using CONSULT.
- 2. Warm engine up to the normal operating temperature.
- 3. Maintain the following conditions for at least 6 consecutive seconds. Hold the accelerator pedal as steady as possible.

< DTC/CIRCUIT DIAGNOSIS >

ENG SPEED	500 – 2,000 rpm (A constant rotation is maintained)	A
COOLAN TEMP/S	More than 20°C (68°F)	
Selector lever	P or N position	EC
 4. Let engine idle for 5. Check 1st trip DTC With GST Follow the procedure "\ 		С
Is 1st trip DTC detected		D
4	NFIRMATION PROCEDURE - 2	E
	IITOR" mode of "ENGINE" using CONSULT. ing conditions for at least 20 consecutive seconds.	F
ENG SPEED	1,400 – 3,175 rpm (A constant rotation is maintained.)	G
COOLAN TEMP/S	More than 60°C (140°F)	0
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.)	Η
CAUTION: Always drive vehi 3. Check 1st trip DTC With GST	cle at a safe speed.	l J
Follow the procedure "		-
NO-1 >> To check m	<u>1?</u> <u>EC-185, "Diagnosis Procedure"</u> . nalfunction symptom before repair: Refer to <u>GI-41, "Intermittent Incident"</u> . on after repair: INSPECTION END	K
Diagnosis Procedu	INFOID:000000012406354	L
1. CHECK DTC PRIOF	RITY	
	is displayed with DTC P0078, P0084, P1078, or P1084, first perform the confirmation nosis) for DTC P0078, P0084, P1078, or P1084.	Μ
YES >> Perform (• DTC P00	diagnosis of applicable. 178: Refer to <u>EC-198, "DTC Description"</u> . 184: Refer to <u>EC-198, "DTC Description"</u> .	Ν
• DTC P10	178: Refer to <u>EC-384, "DTC Description"</u> . 184: Refer to <u>EC-384, "DTC Description"</u> .	0
•	L PRESSURE WARNING LAMP	Р
1. Start the engine.		

1. Start the engine.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

- 2. Check that engine oil pressure warning lamp is not illuminated. <u>Is engine oil pressure warning lamp illuminated?</u>
- YES >> Proceed to <u>LU-8</u>, "Inspection". NO >> GO TO 3.



 $\mathbf{3}$.check exhaust valve timing control solenoid valve

Check exhaust valve timing control solenoid valve. Refer to <u>EC-189, "Component Inspection (Exhaust Valve</u> <u>Timing Control Solenoid Valve)</u>".

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace malfunctioning exhaust valve timing control solenoid valve. Refer to <u>EM-68</u>, "<u>Exploded</u> <u>View</u>".

4.CHECK EXHAUST VALVE TIMING CONTROL POSITION SENSOR

Check exhaust valve timing control position sensor. Refer to <u>EC-188, "Component Inspection (Exhaust Valve</u> Timing Control Position Sensor)".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace malfunctioning exhaust valve timing control position sensor. Refer to <u>EM-68</u>, "<u>Exploded</u> <u>View</u>".

5. CHECK CRANKSHAFT POSITION SENSOR

Check crankshaft position sensor. Refer to <u>EC-187, "Component Inspection (Crankshaft Position Sensor)"</u>.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace crankshaft position sensor. Refer to EM-39, "Exploded View".

6.CHECK CAMSHAFT POSITION SENSOR

Check camshaft position sensor. Refer to <u>EC-187. "Component Inspection (Camshaft Position Sensor)"</u>. <u>Is the inspection result normal?</u>

YES >> GO TO 7.

NO >> Replace malfunctioning camshaft position sensor. Refer to EM-87, "Exploded View".

7.CHECK CAMSHAFT (EXH)

Check the following.

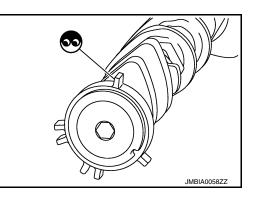
• Accumulation of debris on the signal plate of camshaft rear end

Chipping signal plate of camshaft rear end

Is the inspection result normal?

YES >> GO TO 8.

NO >> Remove debris and clean the signal plate of camshaft rear end or replace camshaft. Refer to <u>EM-88</u>, "<u>Removal</u> and Installation".



8. CHECK TIMING CHAIN INSTALLATION

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

YES >> Check timing chain installation. Refer to EM-69, "Removal and Installation".

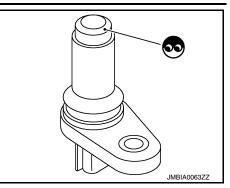
	PU	JU14, PUU∡	24 EVI CONI	RUL	
< DTC/CIRCUIT DIAG	NOSIS >			[VQ35DE	Ε]
NO >> GO TO 9.					
9. CHECK LUBRICATIO	ON CIRCUIT				А
Perform "Inspection of C	amshaft Spro	ocket (EXT) C	il Groove". Refer	to <u>EM-91, "Inspection"</u> .	_
Is the inspection result n					EC
YES >> INSPECTIC NO >> Clean lubric					
		ala afti Da a'tt			0
Component Inspec 1.CHECK CAMSHAFT				INFOID:000000012408	₆₃₅₅ C
		ENSUR (PD/	ASE) - 1		— D
 Turn ignition switch Loosen the fixing bo Disconnect camsha Remove the sensor Visually check the s 	olt of the sens ft position ser . Refer to <u>EM</u>	nsor (PHASE) - <u>54, "Remova</u>			E
Is the inspection result rYES>> GO TO 2.NO>> Replace n(PHASE)P	nalfunctioning	camshaft	position sensor and Installation".		F
(FRASE). K	eiei lo <u>Eim-54</u>	<u>+, Removala</u>	<u>ina mstallation </u> .		G
				JMBIA0065ZZ	Н
2.CHECK CAMSHAFT	POSITION S	ENSOR (PH	ASE) - 2		_
Check resistance camsh	naft position s	ensor (PHAS	E) terminals as fo	llows.	_
Crankshaft position sensor					J
+ –	Con	dition	Resistance		
Terminals					IZ.
1 2					K
1 3	Temperature	25°C (77°F)	Except 0 Ω or ∞		
2 3	10				L
Is the inspection result r YES >> INSPECTIC					
		amshaft posit	tion sensor (PHAS	SE). Refer to EM-54, "Removal and Insta	<mark>al-</mark> M
Component Inspec	tion (Cran	kshaft Pos	ition Sensor)	INFOID:000000012400	06256
1.check cranksha	,		,	IN 012.0000001240	N
1. Turn ignition switch					
 Loosen the fixing bc Disconnect cranksh Remove the sensor. 	olt of the sens aft position se	ensor (POS) h			0
			<u>a view</u> .		Ρ

< DTC/CIRCUIT DIAGNOSIS >

5. Visually check the sensor for chipping.

Is the inspection result normal?

NO >> Replace crankshaft position sensor (POS). Refer to <u>EM-</u> <u>39, "Exploded View"</u>.



2.CHECK CRANKSHAFT POSITION SENSOR (POS) - 2

Check resistance between crankshaft position sensor (POS) terminals as follows.

Crankshaft p	osition sensor			
+	-	Con	Resistance	
Tern	ninals			
1	2			
1	3	Temperature	25°C (77°F)	Except 0 Ω or ∞
2	3			

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace crankshaft position sensor (POS). Refer to <u>EM-39</u>, "<u>Exploded View</u>".

Component Inspection (Exhaust Valve Timing Control Position Sensor)

INFOID:000000012406357

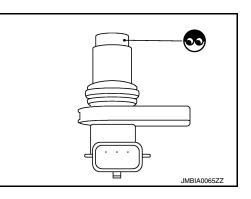
1. EXHAUST VALVE TIMING CONTROL POSITION SENSOR - 1

- 1. Turn ignition switch OFF.
- 2. Disconnect exhaust valve timing control position sensor harness connector.
- 3. Loosen the fixing bolt of the sensor.
- 4. Remove the sensor. Refer to EM-54, "Exploded View".
- 5. Visually check the sensor for chipping.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace malfunctioning exhaust valve timing control position sensor. Refer to <u>EM-54</u>, "<u>Exploded View</u>".



2.EXHAUST VALVE TIMING CONTROL POSITION SENSOR - 2

Check resistance exhaust valve timing control position sensor terminals as follows.

	timing control sensor	Condi		
+ –				Resistance
Terminal				
1	2			
1	3	Temperature	25°C (77°F)	Except 0 Ω or ∞ Ω
2	3			

Is the inspection result normal?

[VQ35DE]

[VQ35DE] < DTC/CIRCUIT DIAGNOSIS > YES >> INSPECTION END NO >> Replace malfunctioning exhaust valve timing control position sensor. Refer to EM-54, "Exploded А <u>View"</u>. Component Inspection (Exhaust Valve Timing Control Solenoid Valve) INFOID:000000012406358 EC 1. CHECK EXHAUST VALVE TIMING CONTROL SOLENOID VALVE - 1 1. Turn ignition switch OFF. 2. Disconnect exhaust valve timing control solenoid valve harness connector. 3. Check resistance between exhaust valve timing control solenoid valve terminals as follows. D Exhaust valve timing control solenoid valve Condition Resistance + Е Terminal 1 2 7.0 – 7.8 Ω 1 x 20°C (68°F) Temperature Ground (Continuity 2 should not exist) Is the inspection result normal? YES >> GO TO 2. NO >> Replace malfunctioning exhaust valve timing control solenoid valve. Refer to EM-68, "Exploded View". Н 2. CHECK EXHAUST VALVE TIMING CONTROL SOLENOID VALVE - 2 1. Remove intake valve timing control solenoid valve. Refer to EM-68, "Exploded View" 2. Apply 12 V between exhaust valve timing control solenoid valve terminals 1 and 2, and then interrupt it. Check that the plunger moves as shown in the figure. CAUTION: Never apply 12 V continuously for 5 seconds or more. Doing so may result in damage to the coil in exhaust valve timing control solenoid valve. NOTE: K

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

Is the inspection result normal?

YES >> INSPECTION END

- NO >> Replace malfunctioning exhaust valve timing control solenoid valve. Refer to <u>EM-68</u>, "<u>Exploded</u> <u>View</u>".
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P0030, P0031, P0032, P0036, P0051, P0052 A/F SENSOR 1 HEATER < DTC/CIRCUIT DIAGNOSIS > [VQ35DE]

P0030, P0031, P0032, P0036, P0051, P0052 A/F SENSOR 1 HEATER

DTC Logic

INFOID:000000012406359

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0030	Air fuel ratio (A/F) sensor 1 heater (bank 1) perfor- mance	Deterioration in A/F sensor 1 heater performance. (Voltage signal transmitted from A/F sensor 1 heat- er to ECM is higher/lower than voltage in the normal range.)	 Harness or connectors (The A/F sensor 1 heater circuit is open or shorted.) A/F sensor 1 heater
P0031	Air fuel ratio (A/F) sensor 1 heater (bank 1) control circuit low	The current amperage in the A/F sensor 1 heater circuit is out of the normal range. (An excessively low voltage signal is sent to ECM through the A/F sensor 1 heater.)	 Harness or connectors (The A/F sensor 1 heater circuit is open or shorted.) A/F sensor 1 heater
P0032	Air fuel ratio (A/F) sensor 1 heater (bank 1) control circuit high	The current amperage in the A/F sensor 1 heater circuit is out of the normal range. (An excessively high voltage signal is sent to ECM through the A/F sensor 1 heater.)	 Harness or connectors (The A/F sensor 1 heater circuit is shorted.) A/F sensor 1 heater
P0036	Air fuel ratio (A/F) sensor 1 heater (bank 2) perfor- mance	Deterioration in A/F sensor 1 heater performance. (Voltage signal transmitted from A/F sensor 1 heat- er to ECM is higher/lower than voltage in the normal range.)	 Harness or connectors (The A/F sensor 1 heater circuit is open or shorted.) A/F sensor 1 heater
P0051	Air fuel ratio (A/F) sensor 1 heater (bank 2) control circuit low	The current amperage in the A/F sensor 1 heater circuit is out of the normal range. (An excessively low voltage signal is sent to ECM through the A/F sensor 1 heater.)	 Harness or connectors (The A/F sensor 1 heater circuit is open or shorted.) A/F sensor 1 heater
P0052	Air fuel ratio (A/F) sensor 1 heater (bank 2) control circuit high	The current amperage in the A/F sensor 1 heater circuit is out of the normal range. (An excessively high voltage signal is sent to ECM through the A/F sensor 1 heater.)	 Harness or connectors (The A/F sensor 1 heater circuit is shorted.) A/F sensor 1 heater

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

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

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 11 V at idle.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

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

Is 1st trip DTC detected?

YES >> Proceed to <u>EC-190</u>, "Diagnosis Procedure".

NG >> INSPECTION END

Diagnosis Procedure

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

1. Disconnect air fuel ratio (A/F) sensor 1 harness connector.

2. Turn ignition switch ON.

3. Check the voltage between A/F sensor 1 harness connector and ground.

Revision: October 2015

EC-190

INFOID:000000012406360

P0030, P0031, P0032, P0036, P0051, P0052 A/F SENSOR 1 HEATER

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

		A/F sensor 1						
DTC	Bank	Connector	Terminal	Ground	Vo	oltage		
P0030, P0031, P0032	1	F28	1					
P0036, P0051, P0052	2	F65	1	Ground	Batter	y voltage		
Is the inspection resul		105	I					
YES >> GO TO 3.								
NO >> GO TO 2.								
2. CHECK AIR FUEL	RATIO (A	/F) SENSO	R 1 POW	ER SUP	PLY C	IRCUIT		
1. Turn ignition swite		,						
2. Disconnect IPDM		ess connect	or.					
3. Check the continu	ity betwee	en A/F sens	or 1 harne	ess conn	ector a	and IPDM E	E/R harness cor	nector.
DTC		A/F sensor	1		IPDN	1 E/R	Continuity	
	Bank	Connector	Termina	al Con	nector	Terminal		
P0030, P0031, P0032	1	F28	1	F	12	57	Existed	
P0036, P0051, P0052	2	F65	1					
Is the inspection resul	t normal?							
YES >> Perform the				supply ci	rcuit.			
NO >> Repair or	•		•					
3 .CHECK A/F SENS	OR 1 HEA	TER OUTF	PUT SIGN	AL CIRC	UIT			
1. Turn ignition swite	h OFF.							
2. Disconnect ECM		onnector.						
Check harness co	ontinuity be	etween A/F	sensor 1	harness	conne	ctor and EC	CM harness cor	inector.
		A/F sensor	1		EC	NA		
DTC	Book				ECM Connector Terminal		Continuity	
P0030, P0031, P0032	Bank 1	Connector F28	2		nector	Terminal 6		
P0036, P0051, P0052	2	F20	2	F	14	46	Existed	
						40		
4. Also check harne		t to ground	and short	to powe	er.			
Is the inspection resul								
YES >> GO TO 4. NO >> Repair op		short to are	ound or ch	ort to po	wor in	harness or	connectors	
4. CHECK A/F SENS	-	0				110111035 01	connectors.	
Check A/F sensor 1 h		er to <u>EC-19</u>	<u>1, "Compo</u>	onent Ins	spectio	<u>n"</u> .		
Is the inspection resul								
YES >> Check interview								ow"
		ing all tuel	ratio (A/F) sensor	i. Ref		4, "Exploded Vi	<u></u> .
Component Inspe	ection							INFOID:000000012406361
1.CHECK AIR FUEL	RATIO (A	/F) SENSO	R 1					
Check resistance betv	•	•		or the fo	lowing			
	VEEN A/F S		mais as p		lowing			
Terminal No.			Resistance	ce		-		
2 and 1		1.8 - 2	2.44 Ω [at 25	5°C (77°F)]		-		
2 and 3, 4			Ω ∞			_		
1 and 3, 4		(Cont	inuity should	d not exist)				

Is the inspection result normal?

P0030, P0031, P0032, P0036, P0051, P0052 A/F SENSOR 1 HEATER

< DTC/CIRCUIT DIAGNOSIS >

YES >> INSPECTION END

NO >> Replace malfunctioning air fuel ratio (A/F) sensor 1. Refer to EM-34, "Exploded View".

P0037, P0038, P0057, P0058 HO2S2 HEATER

< DTC/CIRCUIT DIAGNOSIS >

P0037, P0038, P0057, P0058 HO2S2 HEATER

DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0037	Heated oxygen sensor 2 heater (bank 1) control circuit low	The current amperage in the heated oxygen sensor 2 heater circuit is out of the normal range. (An excessively low voltage signal is sent to ECM through the heated oxygen sensor 2 heater.)	 Harness or connectors (The heated oxygen sensor 2 heater circuit is open or shorted.) Heated oxygen sensor 2 heater
P0038	Heated oxygen sensor 2 heater (bank 1) control circuit high	The current amperage in the heated oxygen sensor 2 heater circuit is out of the normal range. (An excessively high voltage signal is sent to ECM through the heated oxygen sensor 2 heater.)	 Harness or connectors (The heated oxygen sensor 2 heater circuit is shorted.) Heated oxygen sensor 2 heater
P0057	Heated oxygen sensor 2 heater (bank 2) control circuit low	The current amperage in the heated oxygen sensor 2 heater circuit is out of the normal range. (An excessively low voltage signal is sent to ECM through the heated oxygen sensor 2 heater.)	 Harness or connectors (The heated oxygen sensor 2 heater circuit is open or shorted.) Heated oxygen sensor 2 heater
P0058	Heated oxygen sensor 2 heater (bank 2) control circuit high	The current amperage in the heated oxygen sensor 2 heater circuit is out of the normal range. (An excessively high voltage signal is sent to ECM through the heated oxygen sensor 2 heater.)	 Harness or connectors (The heated oxygen sensor 2 heater circuit is shorted.) Heated oxygen sensor 2 heater
P0141	Heated oxygen sensor 2 heater (bank 1) circuit	The current amperage in the heated oxygen sensor 2 heater circuit is out of the normal range. (An excessively high voltage signal is sent to ECM through the heated oxygen sensor 2 heater.)	 Harness or connectors (The heated oxygen sensor 2 heater circuit is shorted.) Heated oxygen sensor 2 heater ECM
P0161	Heated oxygen sensor 2 heater (bank 2) circuit	The current amperage in the heated oxygen sensor 2 heater circuit is out of the normal range. (An excessively high voltage signal is sent to ECM through the heated oxygen sensor 2 heater.)	 Harness or connectors (The heated oxygen sensor 2 heater circuit is shorted.) Heated oxygen sensor 2 heater ECM

1.PRECONDITIONING

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

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

2. Turn ignition switch ON.

3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

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

>> GO TO 2.
2.PERFORM DTC CONFIRMATION PROCEDURE
1. Start engine and warm it up to the normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON.

- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- 6. Let engine idle for 1 minute.

7. Check 1st trip DTC.

Is 1st tip DTC detected?

YES >> Proceed to EC-194, "Diagnosis Procedure".

NO >> INSPECTION END

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P0037, P0038, P0057, P0058 HO2S2 HEATER

< DTC/CIRCUIT DIAGNOSIS >

Diagnosis Procedure

[VQ35DE]

1.CHECK HO2S2 POWER SUPPLY

- 1. Disconnect heated oxygen sensor 2 (HO2S2) harness connector.
- 2. Turn ignition switch ON.

3. Check the voltage between HO2S2 harness connector and ground.

DTC		HO2S2	Ground	Voltage	
DIC	Bank	Connector	Terminal	Ground	voltage
P0037, P0038	1	F86	1	Ground	Battery voltage
P0057, P0058	2	F85	1	Giouna	Dattery Voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.CHECK HO2S2 SENSOR 1 POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.

2. Disconnect IPDM E/R harness connector.

3. Check the continuity between HO2S2 harness connector and IPDM E/R harness connector.

DTC	HO2S2			IPD	Continuity	
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0037, P0038	1	F86	1	F12	56	Existed
P0057, P0058	2	F85	1	F12 50		LAISIEU

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit.

NO >> Repair or replace error-detected parts.

$\mathbf{3}$.check ho2s2 heater output signal circuit for open and short

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.

3. Check the continuity between HO2S2 harness connector and ECM harness connector.

DTC		HO2S2		EC	Continuity	
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0037, P0038	1	F86	2	F14	7	Existed
P0057, P0058	2	F85	2	1 14	47	LAISIEU

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

Is the inspection result normal?

YES >> GO TO 4.

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

4.CHECK HEATED OXYGEN SENSOR 2 HEATER

Check heated oxygen sensor 2 heater. Refer to EC-194, "Component Inspection".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u>.

NO >> Replace malfunctioning heated oxygen sensor 2. Refer to EM-34, "Exploded View".

Component Inspection

1.CHECK HEATED OXYGEN SENSOR 2 HEATER

Check resistance between HO2S2 terminals as per the following.

INFOID:000000012406364

P0037, P0038, P0057, P0058 HO2S2 HEATER

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

Terminal No.	Resistance (Approx.)	A
1 and 2	3.0 Ω [at 25°C (77°F)]	
3 and 1, 2, 4	$\Omega \propto$	EC
4 and 1, 2, 3	(Continuity should not exist)	
ne inspection result norma	<u>I?</u>	С
S >> INSPECTION EN	ID	
>> Replace malfunc	tioning heated oxygen sensor 2. Refer to <u>EM-34, "Exploded V</u>	
		D
		E
		F
		G
		Н
		I
		J
		5
		K
		L
		_
		M
		Ν
		0
		Р

P0075, P0081 IVT CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

P0075, P0081 IVT CONTROL SOLENOID VALVE

DTC Logic

INFOID:000000012406365

IVQ35DE1

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0075	Intake valve timing control so- lenoid valve (bank 1) circuit	An improper voltage is sent to the ECM through intake valve timing control solenoid	Harness or connectors (Intake valve timing control solenoid valve
P0081	Intake valve timing control so- lenoid valve (bank 2) circuit	valve.	circuit is open or shorted.)Intake valve timing control solenoid valve

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

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

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine and let it idle for 5 seconds.
- 2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to EC-196, "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000012406366

1. CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE POWER SUPPLY

- 1. Turn ignition switch OFF.
- 2. Disconnect intake valve timing (IVT) control solenoid valve harness connector.
- 3. Turn ignition switch ON.
- 4. Check the voltage between intake valve timing control solenoid valve harness connector and ground with CONSULT or tester.

DTC	IVT co	ontrol solenoi	d valve	Ground	Voltage	
DIC	Bank	Connector	Terminal	Ground		
P0075	1	F51	1	Ground	Battery voltage	
P0081	2	F52	1	Ground		

Is the inspection result normal?

YES >> GO TO 2.

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

 $\mathbf{2}$.check intake value timing control solenoid value output signal circuit for open and short

1. Turn ignition switch OFF.

- 2. Disconnect ECM harness connector.
- 3. Check the continuity between intake valve timing control solenoid valve harness connector and ECM harness connector.

P0075, P0081 IVT CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

	IVT c	control solenoid	valve	FC	CM			А
DTC	Bank	Connector	Terminal	Connector	Terminal	Continuity		
P0075	1	F51	2		117			
P0081	2	F52	2	F15	119	Existed		EC
4. Also cl	neck harne	ess for short	to ground	and short to	o power.			
Is the inspe			J					С
-	> GO TO 3							
~			-		•	in harness or c	onnectors.	
J. CHECK	INTAKE \	ALVE TIMIN	NG CONTF	ROL SOLEN	NOID VALV	E		D
		-	solenoid v	alve. Refer	to <u>EC-197</u>	, "Component li	nspection".	
Is the inspe								E
						nt Incident".	Refer to EM-68, "Exploded	
110	<u>View"</u> .	mananotion	ing intako					F
Compon	ent Insp	ection					INFOID:000000012406367	Γ
1.CHECK	INTAKE \	ALVE TIMIN	NG CONTF	ROL SOLEN	NOID VALV	E-I		G
		e valve timin						
2. Check	resistance	e between in	take valve	timing cont	rol solenoio	d valve terminal	is as per the following.	Н
Termin	als	Resis	tance					
1 and		7.0 - 7.8 Ω [at		1				
			Ω					
1 or 2 and	ground	(Continuity sh	ould not exist	t)				
Is the inspe	ection resu	<u>ilt normal?</u>						J
	> GO TO 2		ing intoko	volvo timin	a control a	alanaid value	Defer to EM 69. "Evolution	
NO >:	View".	manunction	ing intake	valve umin	ig control s	solenoid valve.	Refer to EM-68, "Exploded	
2. CHECK		ALVE TIMIN	NG CONTE			E-II		K
-						M-68, "Explode	nd View"	
2. Provid	e 12 V DO	C between i	ntake valve	e timing co	ntrol solend	pid		L
		1 and 2, an s shown in t		errupt it. C	heck that t	he		
		5 5110 WIT III L	ne ngure.					B. 4
		V DC cont						Μ
		result in da olenoid val		ine coll in	intake vai	ve		
NOTE								Ν
		 O-ring wl s removed. 		e valve tin	ning conti	rol		
Is the inspe								\circ
		TION END					JMBIA0079ZZ	0
	Replace		ing intake	valve timin	ig control s	solenoid valve.	Refer to EM-68, "Exploded	
	<u>View"</u> .							Ρ

P0078, P0084 EVT CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

P0078, P0084 EVT CONTROL SOLENOID VALVE

DTC Description

INFOID:000000012406368

[VQ35DE]

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0078	EX V/T ACT/CIRC-B1 [Exhaust valve timing control solenoid valve (bank 1) circuit]	An improper voltage is sent to the ECM through exhaust valve timing con-
P0084	EX V/T ACT/CIRC-B2 [Exhaust valve timing control solenoid valve (bank 2) circuit]	trol solenoid valve.

POSSIBLE CAUSE

- · Harness or connectors (Exhaust valve timing control solenoid valve circuit is open or shorted.)
- Exhaust valve timing control solenoid valve

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

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

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start the engine and let it idle for 5 seconds.
- 2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to EC-198, "Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-41, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000012406369

1. CHECK EXHAUST VALVE TIMING CONTROL SOLENOID VALVE POWER SUPPLY CIRCUIT - 1

- 1. Turn ignition switch OFF.
- 2. Disconnect exhaust valve timing control solenoid valve harness connector.
- 3. Turn ignition switch ON.
- 4. Check the voltage between exhaust valve timing control solenoid valve harness connector and ground.

		+			
DTC	Exhaust valve	e timing control	solenoid valve	-	Voltage
	Bank	Connector	Terminal		
P0078	1	F48	1	Ground	Battery volt-
P0084	2	F49	1	Gibunu	age

Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 4.

2.CHECK EVT CONTROL SOLENOID VALVE OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.

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EC-198

P0078, P0084 EVT CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

- 2. Disconnect ECM harness connector.
- 3. Check the continuity between exhaust valve timing control solenoid valve harness connector and ECM A harness connector.

		+			_		E
DTC	Exhaust valve	e timing control	solenoid valve	E	СМ	Continuity	
	Bank	Connector	Terminal	Connector	Terminal		
P0078	1	F48	2		58	Eviated	
P0084	2	F49	2	F15	60	- Existed	
. Also ch	eck harness	for short to g	ground and s	hort to powe	er.		
s the inspe	<u>ction result n</u>	ormal?					
	GO TO 3.						
	• •		•	•		ess or connectors.	
	EXHAUST V						
	aust valve tin trol Solenoid		solenoid valv	ve. Refer to	<u>EC-199, "Co</u>	omponent Inspection (Exhaust Val	<u>/e</u>
	ction result n						
	INSPECTIC						
	Replace ma		exhaust valv	ve timing co	ntrol solenoi	d valve. Refer to EM-68, "Explode	<u>əd</u>
1	<u>View"</u> .						
+.CHECK	EXHAUST V	ALVE TIMIN	G CONTRO	L SOLENOI	D VALVE PC	OWER SUPPLY CIRCUIT - 2	
		y between E	CM harness	connector	and exhaust	t valve timing control solenoid val	/e
harness	s connector.						
		+		_			
			Exhaust valve	timing control			
DTC	E	СМ		id valve	Continuity		
	Connector	Terminal	Connector	Terminal			
P0075	F14	51	F48	1	Existed	-	
P0081		51	F49	I	Existed	-	
2. Also ch	eck harness	for short to g	ground.			-	
•	<u>ction result n</u>						
	Perform the				rcuit.		
	Repair or re		•				
Compone	ent Inspec	tion (Exha	aust Valve	Timing C	ontrol So	lenoid Valve) INFOID:000000012408	370
1.CHECK	EXHAUST V	AI VE TIMIN	G CONTRO	I SOLENOI	D VALVE -	1	
	nition switch						_
	nect exhaust		control sole	noid valve h	arness conn	ector.	
						e terminals as follows.	
		1		1			
	e timing control bid valve						
+			Condition	Re	sistance		
	 minal	-					
				7.0	790		

2

Ground

Temperature

1

1

2



20°C (68°F)

7.0 – 7.8 Ω

 ∞

(Continuity

should not exist)

[VQ35DE]

P0078, P0084 EVT CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

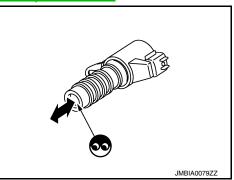
- YES >> GO TO 2.
- NO >> Replace malfunctioning exhaust valve timing control solenoid valve. Refer to <u>EM-68</u>, "<u>Exploded</u> <u>View</u>".

2. CHECK EXHAUST VALVE TIMING CONTROL SOLENOID VALVE - 2

- 1. Remove exhaust valve timing control solenoid valve. Refer to EM-68, "Exploded View".
- Apply 12 V between exhaust valve timing control solenoid valve terminals 1 and 2, and then interrupt it. Check that the plunger moves as shown in the figure.
 CAUTION:

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

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



Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Replace malfunctioning exhaust valve timing control solenoid valve. Refer to <u>EM-68</u>, "<u>Exploded</u> <u>View</u>".

P0101 MAF SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P0101 MAF SENSOR

DTC Logic

DTC DETECTION LOGIC

NOTE: If DTC P0101 is displayed with other DTC, first perform the trouble diagnosis for other DTC.

DTC No.	Trouble diagnos		DTC detecting condition	Possible cause
P0101	(Trouble diagnosis control (Trouble diagnosis co	1 ensor cir-	 A high voltage from the sensor is sent to ECM under light load driving condition. A low voltage from the sensor is sent to ECM under heavy load driving condition. 	 Harness or connectors (The sensor circuit is open or short- ed.) Intake air leaks MAF sensor EVAP control system pressure sensor Intake air temperature sensor
отс со	NFIRMATION PRO	OCEDU	RE	
1. PREC	ONDITIONING			
dure befo 1. Turn 2. Turn 3. Turn	re conducting the ne ignition switch OFF ignition switch ON.	ext test. and wait	RE has been previously conducted, a at least 10 seconds. at least 10 seconds. at least 10 seconds.	lways perform the following proce-
~	ORM DTC CONFIRI	MATION	PROCEDURE	
1 Start	engine and warm it	up to nor	rmai operating temperature	
2. Drive CAU Alwa	the vehicle for at le TION: ys drive vehicle at	ast 5 sec safe spe		
2. Drive CAU Alwa	the vehicle for at le TION: ys drive vehicle at	ast 5 sec safe spe Suitable pos	conds under the following conditions: eed.	
2. Drive CAU Alwa Selector le Vehicle sp NOTI • The	the vehicle for at le TION: ys drive vehicle at ever 2 eed 2 E: e gear must be fixed	ast 5 sec safe spe Suitable pos 40 km/h (25 while dri	conds under the following conditions: eed. sition 5 MPH) or more iving the vehicle.	
2. Drive CAU Alwa Selector le Vehicle sp NOTI • The • Kee 3. Chec	the vehicle for at le TION: ys drive vehicle at ever 5 eed 2 E: e gear must be fixed ep the accelerator point k 1st trip DTC.	ast 5 sec safe spe Suitable pos 40 km/h (25 while dri	conds under the following conditions: eed. sition 5 MPH) or more	
2. Drive CAU Alwa Selector le Vehicle sp NOTI • The • Kee 3. Chec Is 1st trip YES	the vehicle for at le TION: ys drive vehicle at ever 2 eed 2 E: e gear must be fixed ep the accelerator points e t	Suitable pos Suitable pos to km/h (25 while dri edal as s 01, "Diag	conds under the following conditions: eed. sition 5 MPH) or more iving the vehicle. teady as possible during cruising.	
2. Drive CAU Alwa Selector le Vehicle sp NOTI • The • Kee 3. Chec Is 1st trip YES NO	the vehicle for at le TION: ys drive vehicle at ever 2 eed 2 E: e gear must be fixed ep the accelerator per k 1st trip DTC. DTC detected? >> Proceed to EC-2	Suitable pos Suitable pos to km/h (25 while dri edal as s 01, "Diag	conds under the following conditions: eed. sition 5 MPH) or more iving the vehicle. teady as possible during cruising.	INFOID:000000012406372
2. Drive CAU Alwa Selector le Vehicle sp • The • Kee 3. Chec Is 1st trip YES NO	the vehicle for at le TION: ys drive vehicle at ever 5 eed 2 E: e gear must be fixed ep the accelerator per k 1st trip DTC. <u>DTC detected?</u> >> Proceed to <u>EC-2</u> >> INSPECTION EN	ast 5 sec safe spe Suitable pos 40 km/h (25 while dri edal as s 01, "Diag	conds under the following conditions: eed. sition 5 MPH) or more iving the vehicle. teady as possible during cruising.	INFOID:000000012406372
2. Drive CAU Alwa Selector le Vehicle sp NOTI • The • Kee 3. Chec Is 1st trip YES NO Diagnos Diagnos Check the • Air duct • Vacuum • Intake a	the vehicle for at le TION: ys drive vehicle at ever seed 2 eed 2 E: e gear must be fixed ep the accelerator por k 1st trip DTC. DTC detected? >> Proceed to EC-22 >> INSPECTION EN sis Procedure K INTAKE SYSTEM e following for conne	ast 5 sec safe spe Suitable pos 40 km/h (25 while dri edal as s 01, "Diag ND I ection.	conds under the following conditions: eed. sition 5 MPH) or more iving the vehicle. teady as possible during cruising.	INFOID:000000012406372

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INFOID:000000012406371

P0101 MAF SENSOR

< DTC/CIRCUIT DIAGNOSIS >

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

MAF	sensor	Ground	Voltage	
Connector	Connector Terminal		voltage	
F68	1	Ground	Approx. 5 V	

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3. CHECK MASS AIR FLOW (MAF) SENSOR POWER SUPPLY CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM sensor harness connector.
- 3. Check the continuity between MAF sensor harness connector and ECM harness connector.

MAF	MAF sensor		ECM	
Connector	Terminal	Connector	nnector Terminal (
F68	1	F14	28	Existed

Is the inspection result normal?

YES >> Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u>.

NO >> Repair or replace error-detected parts.

4.CHECK MAF SENSOR GROUND CIRCUIT

1. Turn ignition switch OFF.

2. Disconnect ECM harness connector.

3. Check the continuity between MAF sensor harness connector and ECM harness connector.

MAF	sensor	ECM		Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
F68	2	F14	40	Existed	

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

Is the inspection result normal?

YES >> GO TO 5.

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

5.CHECK MAF SENSOR INPUT SIGNAL CIRCUIT

1. Check the continuity between MAF sensor harness connector and ECM harness connector.

MAF	sensor	ECM		Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
F68	3	F14	38	Existed	

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

Is the inspection result normal?

YES >> GO TO 6.

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

 $\mathbf{6}$. CHECK INTAKE AIR TEMPERATURE SENSOR

Check intake air temperature sensor. Refer to EC-203, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace MAF sensor (with intake air temperature sensor). Refer to EM-27. "Exploded View".

			P0101 MAF SENSOR	
< DTC/CIRCU	JIT DIAGNOS	SIS >		[VQ35DE
7.CHECK EV	AP CONTRO	L SYSTEM	PRESSURE SENSOR	
Check EVAP c	control system	pressure	sensor. Refer to <u>EC-333. "Component In</u>	spection".
Is the inspection		al?		
	O TO 8. enlace EV/AP (control sve	tem pressure sensor.	
8.CHECK MA		control sys		
1		EC-203 "	Component Inspection".	
Is the inspectio			oomponent inspection.	
YES >> Ch	heck intermitte	ent incident	t. Refer to <u>GI-41, "Intermittent Incident"</u> . er to <u>EM-27, "Exploded View"</u> .	
Component	t Inspectior	า		INFOID:0000000124065
1				
1.CHECK MA		V (IVIAF) S		
2. Reconnec	ct all harness on ne and warm i		mal operating temperature.	
 Reconnec Start engir Connect C Select "MA 	ne and warm i CONSULT and ASS AIR FLO	t up to nori I select "DA	mal operating temperature. ATA MONITOR" mode. R (Hz)" and check the indication.	
 Reconnec Start engir Connect C 	ne and warm i CONSULT and ASS AIR FLO	t up to norn I select "DA W SENSO	mal operating temperature. ATA MONITOR" mode. R (Hz)" and check the indication. Condition	Indication (Hz)
 Reconnec Start engir Connect C Select "MA Monitor 	ne and warm i CONSULT and ASS AIR FLO ^V or item	t up to norn I select "DA W SENSO Ignition swit	mal operating temperature. ATA MONITOR" mode. R (Hz)" and check the indication. Condition tch ON (Engine stopped.)	Approx. 3,720 Hz
 Reconnec Start engir Connect C Select "MA 	ne and warm i CONSULT and ASS AIR FLO ^V or item	t up to norn I select "DA W SENSO Ignition swit Idle (Engine	mal operating temperature. ATA MONITOR" mode. R (Hz)" and check the indication. Condition tch ON (Engine stopped.) e is warmed-up to normal operating temperature.)	Approx. 3,720 Hz 4,100 – 4,700 Hz
 Reconnec Start engir Connect C Select "MA Monito MASS AIR FLOV 	ne and warm i CONSULT and ASS AIR FLO ^V or item W SENSOR (Hz)	t up to norn select "DA W SENSO Ignition swit Idle (Engine Idle to abou	mal operating temperature. ATA MONITOR" mode. R (Hz)" and check the indication. Condition tch ON (Engine stopped.) e is warmed-up to normal operating temperature.)	Approx. 3,720 Hz
 Reconnec Start engir Connect C Select "MA Monito MASS AIR FLOV *: Check for Without COI Turn ignition Reconnec Start engir 	ne and warm i CONSULT and ASS AIR FLO or item W SENSOR (Hz) linear frequency i NSULT ion switch OFF ct all harness co ne and warm i	t up to norn select "DA W SENSO Ignition swit Idle (Engine Idle to abou rise in respor	mal operating temperature. ATA MONITOR" mode. R (Hz)" and check the indication. Condition tch ON (Engine stopped.) e is warmed-up to normal operating temperature.) it 4,000 rpm	Approx. 3,720 Hz 4,100 – 4,700 Hz 4,100 – 4,700 to Approx. 8,000 Hz
 Reconnec Start engir Connect C Select "MA Monito MASS AIR FLOV *: Check for Without COI Turn ignition Reconnec Start engir 	ne and warm i CONSULT and ASS AIR FLO or item W SENSOR (Hz) linear frequency i NSULT ion switch OFF ct all harness co ne and warm i	t up to norn select "DA W SENSO Ignition swit Idle (Engine Idle to abou rise in respor	ATA MONITOR" mode. R (Hz)" and check the indication. Condition tch ON (Engine stopped.) a is warmed-up to normal operating temperature.) it 4,000 rpm use to engine being increased to about 4,000 rpm. disconnected. mal operating temperature.	Approx. 3,720 Hz 4,100 – 4,700 Hz 4,100 – 4,700 to Approx. 8,000 Hz
 Reconnec Start engir Connect C Select "MA Monito MASS AIR FLOV *: Check for Without COI Turn ignitic Reconnec Start engir Check the 	ne and warm i CONSULT and ASS AIR FLO or item W SENSOR (Hz) Inear frequency i NSULT ion switch OFF ct all harness of ne and warm i e frequency be	t up to norn select "DA W SENSO Ignition swit Idle (Engine Idle to abou rise in respor	ATA MONITOR" mode. R (Hz)" and check the indication. Condition tch ON (Engine stopped.) a is warmed-up to normal operating temperature.) it 4,000 rpm use to engine being increased to about 4,000 rpm. disconnected. mal operating temperature.	Approx. 3,720 Hz 4,100 – 4,700 Hz 4,100 – 4,700 to Approx. 8,000 Hz
 Reconnec Start engir Connect C Select "MA Monito MASS AIR FLOV *: Check for Without COI Turn ignition Reconnec Start engir 	ne and warm i CONSULT and ASS AIR FLO or item W SENSOR (Hz) linear frequency NSULT ion switch OFF ct all harness of ne and warm i e frequency be ECM	t up to norn select "DA W SENSO Ignition swit Idle (Engine Idle to abou rise in respor	mal operating temperature. ATA MONITOR" mode. R (Hz)" and check the indication. Condition tch ON (Engine stopped.) e is warmed-up to normal operating temperature.) it 4,000 rpm ase to engine being increased to about 4,000 rpm. disconnected. mal operating temperature. M harness connector terminals under the Condition	Approx. 3,720 Hz 4,100 – 4,700 Hz 4,100 – 4,700 to Approx. 8,000 Hz e following conditions. Frequency (Hz)
 Reconnec Start engir Connect C Select "MA Monito MASS AIR FLOV *: Check for Without COI Turn ignition Reconnec Start engir Check the 	ne and warm i CONSULT and ASS AIR FLO or item W SENSOR (Hz) UNSULT ion switch OFF ot all harness of ne and warm i e frequency be ECM +	t up to norn select "DA W SENSO Ignition swit Idle (Engine Idle to abou rise in respor	mal operating temperature. ATA MONITOR" mode. R (Hz)" and check the indication. Condition tch ON (Engine stopped.) a is warmed-up to normal operating temperature.) t 4,000 rpm use to engine being increased to about 4,000 rpm. disconnected. mal operating temperature. M harness connector terminals under the Condition Ignition switch ON (Engine stopped.)	Approx. 3,720 Hz 4,100 – 4,700 Hz 4,100 – 4,700 to Approx. 8,000 Hz
 Reconnec Start engir Connect C Select "MA Monito MASS AIR FLOV *: Check for Without COI Turn ignitic Reconnec Start engir Check the 	ne and warm i CONSULT and ASS AIR FLO or item W SENSOR (Hz) UNSULT ion switch OFF ot all harness of ne and warm i e frequency be ECM +	t up to norn select "DA W SENSO Ignition swit Idle (Engine Idle to abou rise in respor	mal operating temperature. ATA MONITOR" mode. R (Hz)" and check the indication. Condition tch ON (Engine stopped.) e is warmed-up to normal operating temperature.) it 4,000 rpm ase to engine being increased to about 4,000 rpm. disconnected. mal operating temperature. M harness connector terminals under the Condition	Approx. 3,720 Hz 4,100 – 4,700 Hz 4,100 – 4,700 to Approx. 8,000 Hz e following conditions. Frequency (Hz)

YES >> GO TO 4.

NO >> GO TO 2.

2.check for the cause of uneven air flow through map sensor

1. Turn ignition switch OFF.

Check for the cause of uneven air flow through MAF sensor. Refer to the following. 2.

- Crushed air ducts
- Malfunctioning seal of air cleaner element _
- Uneven dirt of air cleaner element _
- Improper specification of intake air system parts

Is the inspection result normal?

Ο

Ρ

< DTC/CIRCUIT DIAGNOSIS >

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

3.CHECK MAF SENSOR-II

With CONSULT

1. Repair or replace malfunctioning part.

2. Start engine and warm it up to normal operating temperature.

3. Connect CONSULT and select "DATA MONITOR" mode.

4. Select "MASS AIR FLOW SENSOR (Hz)" and check the indication.

Monitor item	Condition	Indication (Hz)
	Ignition switch ON (Engine stopped.)	Approx. 3,720 Hz
MASS AIR FLOW SENSOR (Hz)	Idle (Engine is warmed-up to normal operating temperature.)	4,100 – 4,700 Hz
	Idle to about 4,000 rpm	4,100 – 4,700 to Approx. 8,000 Hz*

*: Check for linear frequency rise in response to engine being increased to about 4,000 rpm.

Without CONSULT

- 1. Repair or replace malfunctioning part.
- 2. Start engine and warm it up to normal operating temperature.
- 3. Check the frequency between ECM harness connector terminals under the following conditions.

	ECM				
Connector	+	-	Condition	Frequency (Hz)	
Connector	Terminal				
			Ignition switch ON (Engine stopped.)	Approx. 3,720 Hz	
F14	38	40	Idle (Engine is warmed-up to normal operating temperature.)	4,100 – 4,700 Hz	
			Idle to about 4,000 rpm	4,100 – 4,700 to Approx. 8,000 Hz*	

*: Check for linear frequency rise in response to engine being increased to about 4,000 rpm.

Is the inspection result normal?

YES >> INSPECTION END NO >> GO TO 4.

NO >> GO 10 4.

4.CHECK MAF SENSOR-III

With CONSULT

- 1. Turn ignition switch OFF.
- 2. Disconnect MAF sensor harness connector and reconnect it again.
- 3. Start engine and warm it up to normal operating temperature.
- 4. Connect CONSULT and select "DATA MONITOR" mode.
- 5. Select "MASS AIR FLOW SENSOR (Hz)" and check the indication.

Monitor item	Condition	Indication (Hz)
	Ignition switch ON (Engine stopped.)	Approx. 3,720 Hz
MASS AIR FLOW SENSOR (Hz)	Idle (Engine is warmed-up to normal operating temperature.)	4,100 – 4,700 Hz
	Idle to about 4,000 rpm	4,100 – 4,700 to Approx. 8,000 Hz*

*: Check for linear frequency rise in response to engine being increased to about 4,000 rpm.

Without CONSULT

- 1. Turn ignition switch OFF.
- 2. Disconnect MAF sensor harness connector and reconnect it again.
- 3. Start engine and warm it up to normal operating temperature.
- 4. Check the frequency between ECM harness connector terminals under the following conditions.

P0101 MAF SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

	ECM	1		
Connector	+	_	Condition	Frequency (Hz)
Connector	Terr	ninal		
			Ignition switch ON (Engine stopped.)	Approx. 3,720 Hz
F14	38	40	Idle (Engine is warmed-up to normal operating temperature.)	4,100 – 4,700 Hz
			Idle to about 4,000 rpm	4,100 – 4,700 to Approx. 8,000 Hz*
*: Check fo	r linear frequend	cy rise in respor	nse to engine being increased to about 4,000 rpm	
s the inspect	ion result no	rmal?		
	NSPECTION			
NO >> C	Clean or repla	ace MAF sen	sor. Refer to EM-27, "Removal and Insta	allation".

P0102, P0103 MAF SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P0102, P0103 MAF SENSOR

DTC Logic

NOTE:

If DTC P0102 or P0103 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. Refer to <u>EC-379, "DTC Logic"</u>.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0102	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 leakage Mass air flow sensor
P0103	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

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

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

Which DTC is detected?

P0102 >> GO TO 2. P0103 >> GO TO 3.

P0103 >> GO TO 3.

2. PERFORM DTC CONFIRMATION PROCEDURE FOR DTC P0102

- 1. Start engine and wait at least 5 seconds.
- 2. Check DTC.

Is DTC detected?

YES >> Proceed to EC-206, "Diagnosis Procedure".

NO >> INSPECTION END

3.PERFORM DTC CONFIRMATION PROCEDURE FOR DTC P0103-I

- 1. Turn ignition switch ON and wait at least 5 seconds.
- 2. Check DTC.

Is DTC detected?

- YES >> Proceed to EC-206. "Diagnosis Procedure".
- NO >> GO TO 4.

4.PERFORM DTC CONFIRMATION PROCEDURE FOR DTC P0103-II

- 1. Start engine and wait at least 5 seconds.
- 2. Check DTC.

Is DTC detected?

- YES >> Proceed to <u>EC-206, "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

Diagnosis Procedure

1.INSPECTION START

Confirm the detected DTC.

Which DTC is detected?

P0102 >> GO TO 2.

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INFOID:000000012406374

INFOID-000000012406375

P0102, P0103 MAF SENSOR

GNOSIS >				[VQ35DE]
YSTEM				
r connection.				
etween air duc	t to intak	e manifolo		•
t normal?				
t the narts				
•				
		arness co	nector	
h ON.				
between MAF	sensor h	narness co	onnector and ground.	
	round	Volta	ge (V)	
1 Gi	round	Аррі	ox. 5	
t normal?				
	SUPPLY	CIRCUIT		
		or harness	connector and ECM ha	arness connector
	ECM			
nal Connec	1	Terminal	Continuity	
nal Connec F14	1			
	1	Terminal	Continuity	
F14 t normal? ermittent incide	tor	Terminal 28 • to <u>GI-41,</u>	Continuity	
F14 t normal? ermittent incide replace error-d	nt. Refer	Terminal 28 • to <u>GI-41,</u> parts.	Continuity Existed "Intermittent Incident".	
F14 t normal? ermittent incide replace error-d SOR GROUND	nt. Refer etected p CIRCUI	Terminal 28 • to <u>GI-41,</u> parts. T FOR OI	Continuity Existed "Intermittent Incident". PEN AND SHORT	
F14 t normal? ermittent incide replace error-d SOR GROUND	nt. Refer etected p CIRCUI	Terminal 28 • to <u>GI-41,</u> parts. T FOR OI	Continuity Existed "Intermittent Incident".	
F14 t normal? ermittent incide replace error-d SOR GROUND	tor nt. Refer etected p CIRCUI AF senso	Terminal 28 • to <u>GI-41,</u> parts. T FOR OI	Continuity Existed "Intermittent Incident". PEN AND SHORT	
F14 t normal? ermittent incide replace error-d SOR GROUND	tor nt. Refer etected p CIRCUI AF senso ECM	Terminal 28 • to <u>GI-41,</u> parts. T FOR OI	Continuity Existed "Intermittent Incident". PEN AND SHORT	
F14 t normal? ermittent incide replace error-d SOR GROUND ity between M/	tor nt. Refer etected p CIRCUI AF senso ECM	Terminal 28 to <u>GI-41,</u> parts. T FOR OI or harness	Continuity Existed "Intermittent Incident". PEN AND SHORT connector and ECM ha	
F14 t normal? ermittent incide replace error-d SOR GROUND ity between MA nal Connec	tor The formation of th	Terminal 28 to <u>GI-41,</u> parts. T FOR OI or harness Terminal 40	Continuity Existed "Intermittent Incident". PEN AND SHORT connector and ECM ha Continuity Existed	
F14 F14 ermittent incide replace error-d SOR GROUND ity between MA nal Connec F14	tor The formation of th	Terminal 28 to <u>GI-41,</u> parts. T FOR OI or harness Terminal 40	Continuity Existed "Intermittent Incident". PEN AND SHORT connector and ECM ha Continuity Existed	
F14 F14 ermittent incide replace error-d SOR GROUND ity between M/ nal Connec F14 ss for short to g t normal?	tor nt. Refer etected p CIRCUI AF senso ECM tor	Terminal 28 to <u>GI-41,</u> parts. T FOR OI or harness Terminal 40 nd short to	Continuity Existed "Intermittent Incident". PEN AND SHORT connector and ECM ha Continuity Existed power.	arness connector.
F14 F14 ermittent incide replace error-d SOR GROUND ity between MA nal Connec F14 ss for short to g t normal? en circuit, shor	tor nt. Refer etected p CIRCUI AF senso ECM tor pround ar	Terminal 28 to <u>GI-41,</u> parts. T FOR OI or harness Terminal 40 nd short to	Continuity Existed "Intermittent Incident". PEN AND SHORT connector and ECM ha Continuity Existed power.	arness connector.
F14 t normal? ermittent incide replace error-d SOR GROUND ity between M/ nal Connec F14 ss for short to g t normal? en circuit, short SOR INPUT SI	tor nt. Refer etected p CIRCUI AF senso ECM tor pround ar to grour GNAL CI	Terminal 28 to <u>GI-41,</u> parts. T FOR OI or harness Terminal 40 nd short to nd or shor	Continuity Existed "Intermittent Incident". PEN AND SHORT connector and ECM ha Continuity Existed power. : to power in harness of DR OPEN AND SHORT	arness connector. r connectors.
F14 t normal? ermittent incide replace error-d SOR GROUND ity between M/ nal Connec F14 ss for short to g t normal? en circuit, short SOR INPUT SI	tor nt. Refer etected p CIRCUI AF senso ECM tor pround ar to grour GNAL CI	Terminal 28 to <u>GI-41,</u> parts. T FOR OI or harness Terminal 40 nd short to nd or shor	Continuity Existed "Intermittent Incident". PEN AND SHORT connector and ECM ha Continuity Existed power.	arness connector. r connectors.
F14 t normal? ermittent incide replace error-d SOR GROUND ity between M/ nal Connec F14 ss for short to g t normal? en circuit, short SOR INPUT SI	tor nt. Refer etected p CIRCUI AF senso ECM tor pround ar to grour GNAL CI	Terminal 28 to <u>GI-41,</u> parts. T FOR OI or harness Terminal 40 nd short to nd or shor	Continuity Existed "Intermittent Incident". PEN AND SHORT connector and ECM ha Continuity Existed power. : to power in harness of DR OPEN AND SHORT	arness connector. r connectors.
	YSTEM or connection. between air duc t normal? ct the parts. SOR POWER S air flow (MAF) ch ON. between MAF Grainal 1 Gr 1	YSTEM r connection. between air duct to intak t normal? ct the parts. SOR POWER SUPPLY air flow (MAF) sensor h ch ON. between MAF sensor h Ground 1 Ground 1 Ground t normal? SOR POWER SUPPLY ch OFF. harness connector.	YSTEM r connection. between air duct to intake manifold t normal? ct the parts. SOR POWER SUPPLY air flow (MAF) sensor harness con- ch ON. between MAF sensor harness con- ch ON. c foround Voltage 1 Ground Voltage 1 Ground Appri- t normal? SOR POWER SUPPLY CIRCUIT ch OFF. harness connector.	YSTEM r connection. etween air duct to intake manifold <u>t normal?</u> ct the parts. SOR POWER SUPPLY air flow (MAF) sensor harness connector. ch ON. e between MAF sensor harness connector and ground. <u>minal</u> <u>Ground</u> Voltage (V) <u>1</u> <u>Ground</u> <u>Approx. 5</u> <u>t normal?</u> SOR POWER SUPPLY CIRCUIT ch OFF.

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

F14

3

F68

Existed

38

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 7.

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

7.CHECK MASS AIR FLOW SENSOR

Check mass air flow sensor. Refer to EC-208, "Component Inspection".

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u>.
- NO >> Replace mass air flow sensor. Refer to EM-27, "Exploded View".

Component Inspection

INFOID:000000012406376

1.CHECK MASS AIR FLOW (MAF) SENSOR-I

With CONSULT

- 1. Turn ignition switch OFF.
- 2. Reconnect all harness connectors disconnected.
- 3. Start engine and warm it up to normal operating temperature.
- 4. Connect CONSULT and select "DATA MONITOR" mode.
- 5. Select "MASS AIR FLOW SENSOR (Hz)" and check the indication.

Monitor item	Condition	Indication (Hz)
	Ignition switch ON (Engine stopped.)	Approx. 3,720 Hz
MASS AIR FLOW SENSOR (Hz)	Idle (Engine is warmed-up to normal operating temperature.)	4,100 – 4,700 Hz
	Idle to about 4,000 rpm	4,100 – 4,700 to Approx. 8,000 Hz*

*: Check for linear frequency rise in response to engine being increased to about 4,000 rpm.

Without CONSULT

- 1. Turn ignition switch OFF.
- 2. Reconnect all harness connectors disconnected.
- 3. Start engine and warm it up to normal operating temperature.
- 4. Check the frequency between ECM harness connector terminals under the following conditions.

	ECM				
Connector	+	-	Condition	Frequency (Hz)	
Connector	Terminal				
			Ignition switch ON (Engine stopped.)	Approx. 3,720 Hz	
F14	38	40	Idle (Engine is warmed-up to normal operating temperature.)	4,100 – 4,700 Hz	
			Idle to about 4,000 rpm	4,100 – 4,700 to Approx. 8,000 Hz*	

*: Check for linear frequency rise in response to engine being increased to about 4,000 rpm.

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 2.

2.CHECK FOR THE CAUSE OF UNEVEN AIR FLOW THROUGH MAF SENSOR

- 1. Turn ignition switch OFF.
- 2. Check for the cause of uneven air flow through MAF sensor. Refer to the following.
- Crushed air ducts
- Malfunctioning seal of air cleaner element
- Uneven dirt of air cleaner element
- Improper specification of intake air system parts

Is the inspection result normal?

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

P0102, P0103 MAF SENSOR

< DTC/CIRCUIT DIAGNOSIS >

3.CHECK MAF SENSOR-II

With CONSULT

- 1. Repair or replace malfunctioning part.
- 2. Start engine and warm it up to normal operating temperature.
- 3. Connect CONSULT and select "DATA MONITOR" mode.
- 4. Select "MASS AIR FLOW SENSOR (Hz)" and check the indication.

Monitor item	Condition	Indication (Hz)	C
	Ignition switch ON (Engine stopped.)	Approx. 3,720 Hz	
MASS AIR FLOW SENSOR (Hz)	Idle (Engine is warmed-up to normal operating temperature.)	4,100 – 4,700 Hz	D
	Idle to about 4,000 rpm	4,100 – 4,700 to Approx. 8,000 Hz*	

*: Check for linear frequency rise in response to engine being increased to about 4,000 rpm.

Without CONSULT

- 1. Repair or replace malfunctioning part.
- 2. Start engine and warm it up to normal operating temperature.
- 3. Check the frequency between ECM harness connector terminals under the following conditions.

ECM					
Connector	+	-	Condition	Frequency (Hz)	G
Connector	Terminal				
			Ignition switch ON (Engine stopped.)	Approx. 3,720 Hz	F
F14	38	40	Idle (Engine is warmed-up to normal operating temperature.)	4,100 – 4,700 Hz	
			Idle to about 4,000 rpm	4,100 – 4,700 to Approx. 8,000 Hz*	

*: Check for linear frequency rise in response to engine being increased to about 4,000 rpm.

Is the inspection result normal?

YES	>> INSPECTION END
NO	>> GO TO 4.

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4.CHECK MAF SENSOR-III

With CONSULT

- 1. Turn ignition switch OFF.
- 2. Disconnect MAF sensor harness connector and reconnect it again.
- 3. Start engine and warm it up to normal operating temperature.
- 4. Connect CONSULT and select "DATA MONITOR" mode.
- 5. Select "MASS AIR FLOW SENSOR (Hz)" and check the indication.

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Monitor item	Condition	Indication (Hz)	
	Ignition switch ON (Engine stopped.)	Approx. 3,720 Hz	NI
MASS AIR FLOW SENSOR (Hz)	Idle (Engine is warmed-up to normal operating temperature.)	4,100 – 4,700 Hz	IN
	Idle to about 4,000 rpm	4,100 – 4,700 to Approx. 8,000 Hz*	

*: Check for linear frequency rise in response to engine being increased to about 4,000 rpm.

Without CONSULT

- 1. Turn ignition switch OFF.
- 2. Disconnect MAF sensor harness connector and reconnect it again.
- 3. Start engine and warm it up to normal operating temperature.
- 4. Check the frequency between ECM harness connector terminals under the following conditions.

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P0102, P0103 MAF SENSOR

< DTC/CIRCUIT DIAGNOSIS >

ECM					
Connector	+ – Terminal		Condition	Frequency (Hz)	
Connector					
				Ignition switch ON (Engine stopped.)	Approx. 3,720 Hz
F14	38 40		Idle (Engine is warmed-up to normal operating temperature.)	4,100 – 4,700 Hz	
			Idle to about 4,000 rpm	4,100 – 4,700 to Approx. 8,000 Hz*	

*: Check for linear frequency rise in response to engine being increased to about 4,000 rpm.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Clean or replace MAF sensor. Refer to <u>EM-27. "Removal and Installation"</u>.

P0111 IAT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P0111 IAT SENSOR

DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis (Trouble diagnosis content)	DTC detecting condition	Possible cause
P0111	IAT SENSOR 1 B1 [Intake air temperature (IAT) sensor circuit range/perfor- mance]	The comparison result of signals transmitted to ECM from each temperature sensor (IAT sensor, ECT sensor, FTT sensor, and EOT sensor) shows that the voltage signal of the IAT sensor is higher/lower than that of other temperature sensors when the engine is started with its cold state.	 Harness or connectors (High or low resistance in the IAT sensor circuit) IAT sensor
	NFIRMATION PROCEDU	JRE	
I.INSPE			
	ssary to erase permanent D	DTC?	
	>> GO TO 3. >> GO TO 2.		
2.perf	ORM COMPONENT FUNC	TION CHECK	
Perform o	component function check.	Refer to EC-212, "Component Function	<u>Check"</u> .
Use the c		check the overall function of the IAT	sensor circuit. During this check, a
•	TC might not be confirmed.		
YES :	>> INSPECTION END	waasia Deelaaduwa "	
•	>> Proceed to <u>EC-212, "Dia</u> ONDITIONING	ignosis Procedure.	
		RE has been previously conducted, al	ways perform the following proce-
	re conducting the next test. ignition switch OFF and wa		
2. Turn	ignition switch ON. ignition switch OFF and wa		
TESTING	CONDITION:		
 Before 	performing the following	procedure, do not add fuel. procedure, check that fuel level is b	
 Before 	performing the following	procedure, confirm that battery volt	age is 11 V or more at idle.
;	>> GO TO 4.		
4 .PERF	ORM DTC CONFIRMATION	N PROCEDURE	
1. Move NOT	e the vehicle to a cool place E:		
Cool 2. Turn	the vehicle in an environme	ent of ambient air temperature between ve the vehicle for 12 hours.	–10°C (14°F) and 35°C (95°F).
Neve	r turn ignition switch ON	during this procedure.	
	vehicle must be cooled with		
	engine and let it idle for 5 n TION:	ninutes or more.	
	r turn ignition switch OFF k 1st trip DTC.	during idling.	

4. Check 1st trip DTC.

INFOID:000000012406377

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P0111 IAT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

Is 1st trip DTC detected?

- YES >> Proceed to EC-212, "Diagnosis Procedure".
- NO >> INSPECTION END

Component Function Check

1. CHECK INTAKE AIR TEMPERATURE (IAT) SENSOR

1. Turn ignition switch OFF.

2. Disconnect mass air flow sensor harness connector.

3. Check resistance between mass air flow sensor terminals as follows.

Terminals	Condition	Resistance (k Ω)	
1 and 2	Temperature [°C (°F)]	25 (77)	1,800 – 2,200

Is the inspection result normal?

YES >> Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u>.

NO >> Proceed to EC-212, "Diagnosis Procedure".

Diagnosis Procedure

1.CHECK INTAKE AIR TEMPERATURE (IAT) SENSOR

Check intake air temperature sensor. Refer to EC-212. "Component Inspection".

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u>.
- NO >> Replace mass air flow sensor (with intake air temperature sensor). Refer to <u>EM-27. "Exploded</u> <u>View"</u>.

Component Inspection

1. CHECK INTAKE AIR TEMPERATURE (IAT) SENSOR

- 1. Turn ignition switch OFF.
- 2. Disconnect mass air flow sensor harness connector.
- 3. Check resistance between mass air flow sensor terminals as follows.

Terminals	Condition	Resistance (k Ω)	
1 and 2	Temperature [°C (°F)]	25 (77)	1,800 – 2,200

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace mass air flow sensor (with intake air temperature sensor). Refer to <u>EM-27</u>, "<u>Exploded</u> <u>View</u>".

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P0112, P0113 IAT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P0112, P0113 IAT SENSOR

DTC Logic

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INFOID:000000012406381

[VQ35DE]

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis	DTC detectin	a condition	Possible cause
DICINU.	name		goonation	
P0112	Intake air tempera- ture sensor circuit low input	An excessively low voltage sent to ECM.	e from the sensor is	 Harness or connectors (The sensor circuit is open or shorted.)
P0113	Intake air tempera- ture sensor circuit high input	An excessively high volta sent to ECM.	ge from the sensor is	Intake air temperature sensor
DTC CON	FIRMATION PF	ROCEDURE		
1.PRECC	NDITIONING			
f DTC Co	nfirmation Proced	ure has been previous	sly conducted, alw	ays perform the following before conduct-
2. Turn ig	gnition switch OFF gnition switch ON.	⁻ and wait at least 10 ⁻ and wait at least 10 ⁻		
S	> GO TO 2.			
~		RMATION PROCEDU	RF	
		and wait at least 5 se		
2. Check	1st trip DTC.			
	DTC detected?		aluma II	
	> INSPECTION E	213, "Diagnosis Proce ND	<u>aure</u> .	
Diagnos	is Procedure			INFOID:000000012406382
		MPERATURE SENSC		
2. Turn ig	gnition switch ON.	·	-	nsor) harness connector.
3. Check	the voltage betw	een mass air flow sen	sor harness conne	ector and ground.
	MAF sensor			
Connec		Ground	Voltage	
F68	4	Ground	Approx. 5 V	
is the insp	ection result norm	al?		
-	> GO TO 2.	wit abort to ground a	cohort to now or in	harposs or conpostors
-		-	•	harness or connectors. CUIT FOR OPEN AND SHORT
	gnition switch OFF			
	nnect ECM harnes			

2. Disconnect ECM harness connector.

3. Check harness continuity between mass air flow sensor harness connector and ECM harness connector.

MAF sensor		ECM		Continuity	
Connector	Terminal	Connector Terminal		Continuity	
F68	2	F14	40	Existed	

P0112, P0113 IAT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

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

Is the inspection result normal?

YES >> GO TO 3.

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

 $\mathbf{3}$. CHECK INTAKE AIR TEMPERATURE SENSOR

Check intake air temperature sensor. Refer to EC-214, "Component Inspection".

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
- NO >> Replace mass air flow sensor (with intake air temperature sensor). Refer to <u>EM-27</u>, "<u>Exploded</u> <u>View</u>".

Component Inspection

INFOID:000000012406383

1. CHECK INTAKE AIR TEMPERATURE SENSOR

1. Turn ignition switch OFF.

2. Disconnect mass air flow sensor harness connector.

3. Check resistance between mass air flow sensor terminals as per the following.

Terminal	Condition	Resistance (k Ω)	
2 and 4	Temperature [°C (°F)]	25 (77)	1.800 - 2.200

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace mass air flow sensor (with intake air temperature sensor). Refer to <u>EM-27</u>, "<u>Exploded</u> <u>View</u>".

P0116 ECT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P0116 ECT SENSOR

DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis (Trouble diagnosis content)	DTC detecting condition	Possible cause
P0116	ECT SEN/CIRC [Engine coolant temperature (ECT) sensor circuit range/per- formance]	The comparison result of signals transmitted to ECM from each temperature sensor (IAT sensor, ECT sensor, FTT sensor, and EOT sensor) shows that the voltage signal of the ECT sensor is higher/lower than that of other temperature sensors when the engine is started with its cold state.	 Harness or connectors (High or low resistance in the ECT sensor circuit) ECT sensor
	NFIRMATION PROCEDU	JRE	
1. INSPE	CTION START		
YES	<u>ssary to erase permanent D</u> >> GO TO 3. >> GO TO 2.	TC?	
2.perf	ORM COMPONENT FUNC	TION CHECK	
Perform o	component function check. F	Refer to EC-216, "Component Function	<u>Check"</u> .
Use the c	component function check to TC might not be confirmed.	check the overall function of the ECT	sensor circuit. During this check, a
Is the ins	pection result normal?		
	> INSPECTION END > Proceed to <u>EC-216, "Dia</u>	gnosis Procedure".	
•	ONDITIONING		
dure befo	ONFIRMATION PROCEDU ore conducting the next test. ignition switch OFF and wa	RE has been previously conducted, al t at least 10 seconds.	ways perform the following proce-
	ignition switch ON. ignition switch OFF and wai	t at least 10 seconds.	
TESTING	CONDITION:	procedure, do not add fuel.	
 Before 	performing the following	procedure, do not add idel. procedure, check that fuel level is b procedure, confirm that battery volt	
	>> GO TO 4.		
4.PERF	ORM DTC CONFIRMATION	I PROCEDURE	
1. Move NOT	e the vehicle to a cool place. E:		
Cool 2. Turn		nt of ambient air temperature between el the vehicle for 12 hours.	−10°C (14°F) and 35°C (95°F).
-	er turn ignition switch ON	during this procedrue.	
The 3. Start	C. vehicle must be cooled with engine and let it idle for 5 m TION:		
Neve	er turn ignition switch OFF	during idling.	

4. Check 1st trip DTC.

INFOID:000000012406384

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< DTC/CIRCUIT DIAGNOSIS >

Is 1st trip DTC detected?

- YES >> Proceed to EC-216, "Diagnosis Procedure".
- NO >> INSPECTION END

Component Function Check

1.CHECK ENGINE COOLANT TEMPERATURE (ECT) SENSOR

- 1. Turn ignition switch OFF.
- 2. Disconnect ECT sensor harness connector.
- 3. Remove ECT sensor. Refer to CO-27, "Exploded View".
- 4. Check resistance between ECT sensor terminals by heating with hot water as shown in the figure.

Terminals	Condition		Resistance (k Ω)
		20 (68)	2.1 – 2.9
1 and 2	Temperature [°C (°F)]	50 (122)	0.68 – 1.00
		90 (194)	0.236 - 0.260

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to <u>GI-41, "Intermittent</u> <u>Incident"</u>.
- NO >> Proceed to EC-216, "Diagnosis Procedure".

Diagnosis Procedure

1.CHECK ENGINE COOLANT TEMPERATURE (ECT) SENSOR

Check ECT sensor. Refer to EC-216, "Component Inspection".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u>.

NO >> Replace ECT sensor. Refer to <u>CO-27, "Exploded View"</u>.

Component Inspection

1. CHECK ENGINE COOLANT TEMPERATURE SENSOR

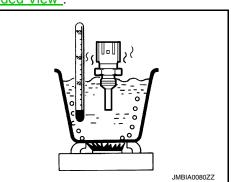
- 1. Turn ignition switch OFF.
- 2. Disconnect engine coolant temperature sensor harness connector.
- 3. Remove engine coolant temperature sensor. Refer to CO-27. "Exploded View".
- Check resistance between engine coolant temperature sensor terminals as per the following.

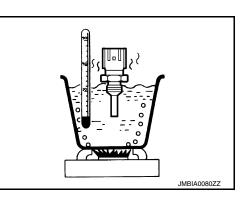
Terminals	Condition		Resistance (k Ω)
1 and 2	Temperature [°C (°F)]	20 (68)	2.1 - 2.9
		50 (122)	0.68 - 1.00
		90 (194)	0.236 - 0.260

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace engine coolant temperature sensor. Refer to <u>CO-27, "Exploded View"</u>.





INFOID:000000012406386

INFOID:000000012406387

INFOID:000000012406385

P0117, P0118 ECT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P0117, P0118 ECT SENSOR

DTC Logic

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INFOID:000000012406388

[VQ35DE]

DTC DETECTION LOGIC

DTC No.	Trouble Diagnosis Name	DTC detectir	ng condition	Possible Cause
P0117	Engine coolant tem- perature sensor cir- cuit low input	An excessively low volta sent to ECM.	age from the sensor is	 Harness or connectors (The sensor circuit is open or shorted.)
P0118	Engine coolant tem- perature sensor cir- cuit high input	An excessively high volt sent to ECM.	age from the sensor is	Engine coolant temperature sensor
	NFIRMATION PRO	OCEDURE		
1. PRECO	ONDITIONING			
		re has been previous	ly conducted, alwa	ays perform the following before conduct-
ing the ne 1. Turn i		and wait at least 10 s	seconds.	
2. Turn i	gnition switch ON.			
3. Turn i	gnition switch OFF	and wait at least 10 s	Seconds.	
>	> GO TO 2.			
~		MATION PROCEDU	RE	
		nd wait at least 5 sec		
2. Checl	CDTC.			
Is DTC de				
	Proceed to <u>EC-2</u> INSPECTION EN	<u>17, "Diagnosis Proce</u> ID	<u>dure"</u> .	
-	sis Procedure			NEC/10-00000011406380
				INFOID:000000012406389
1.CHECH	KECT SENSOR PO	OWER SUPPLY		
		nt temperature (ECT)	sensor harness c	onnector.
	gnition switch ON. < the voltage between	en ECT sensor harne	ess connector and	ground.
	0			5
	ECT sensor	Ground	Voltage	
Conne	ctor Terminal		voltage	
F80) 1	Ground	Approx. 5 V	
•	ection result norma	<u> ?</u>		
-	> GO TO 2.	uit short to around or	short to power in	harness or connectors.
~	· ·	ROUND CIRCUIT FC	•	

1. Turn ignition switch OFF.

2. Disconnect ECM harness connector.

3. Check the continuity between ECT sensor harness connector and ECM harness connector.

ECT	sensor	E	CM	Continuity
Connector	Terminal	Connector	Terminal	Continuity
F80	2	F14	35	Existed

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

EC-217

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P0117, P0118 ECT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 3.

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

3.CHECK ENGINE COOLANT TEMPERATURE SENSOR

Check engine coolant temperature sensor. Refer to EC-218. "Component Inspection".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u>.

NO >> Replace engine coolant temperature sensor. Refer to <u>CO-27, "Exploded View"</u>.

Component Inspection

INFOID:000000012406390

1.CHECK ENGINE COOLANT TEMPERATURE SENSOR

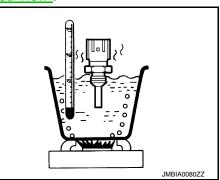
- 1. Turn ignition switch OFF.
- 2. Disconnect engine coolant temperature sensor harness connector.
- 3. Remove engine coolant temperature sensor. Refer to CO-27, "Exploded View".
- 4. Check resistance between engine coolant temperature sensor terminals as per the following.

Terminals	Condition		Resistance (k Ω)
		20 (68)	2.1 - 2.9
1 and 2	Temperature [°C (°F)]	50 (122)	0.68 - 1.00
		90 (194)	0.236 - 0.260

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace engine coolant temperature sensor. Refer to CO-27, "Exploded View".



[VQ35DE]

P0122, P0123 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P0122, P0123 TP SENSOR

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P0122 or P0123 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. Refer to <u>EC-379, "DTC Logic"</u>.

DTC No.	Trouble diagnosis name	DTC de	tecting condition	Possible cause
P0122	Throttle position sensor 2 circuit low input	An excessively low 2 is sent to ECM.	voltage from the TP sensor	Harness or connectors (TP sensor 2 circuit is open or shorted.)
P0123	Throttle position sensor 2 circuit high input	An excessively high 2 is sent to ECM.	voltage from the TP sensor	Electric throttle control actuator (TP sensor 2)
DTC CON	FIRMATION PROCI	EDURE		
1.PRECO	NDITIONING			
If DTC Con	firmation Procedure h	as been previous	sly conducted, always	perform the following before conduct-
ing the nex		weit at least 10		-
	nition switch OFF and nition switch ON.	wait at least 10	seconas.	
3. Turn ig	nition switch OFF and	wait at least 10	seconds.	
	CONDITION: forming the followin	a procedure co	nfirm that battery yo	tage is more than 8 V at idle.
		9 p. 00000010, 00		
>>	GO TO 2.			
2.PERFO	RM DTC CONFIRMAT	ION PROCEDU	RE	
	ngine and let it idle for	1 second.		
2. Check				
Is DTC det			aluma II	
YES >> NO >>	Proceed to <u>EC-219.</u> INSPECTION END	Diagnosis Proce	<u>aure</u> .	
	s Procedure			NUTCHD-000000040405000
				INFOID:000000012406392
1.CHECK	THROTTLE POSITIC	N SENSOR 2 P	OWER SUPPLY	
	nect electric throttle c	ontrol actuator ha	arness connector.	
	nition switch ON.	ectric throttle co	ntrol actuator harness	connector and ground.
o. oncor	the voltage between t			connector and ground.
Electric t	hrottle control actuator	Creation		
Connect	or Terminal	Ground	Voltage	
F50	5	Ground	Approx. 5 V	
	ection result normal?			
	• GO TO 3.			
-	GO TO 2.			UT
L .CHECK	INKUTTLE PUSITIC	IN SENSOR 2 PO	OWER SUPPLY CIRCU	וור

1. Turn ignition switch OFF.

- 2. Disconnect ECM harness connector.
- 3. Check the continuity between electric throttle control actuator harness connector and ECM harness connector.

INFOID:000000012406391

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P0122, P0123 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

Electric throttle	control actuator	E	CM	Continuity
Connector	Terminal	Connector	Terminal	Continuity
F50	5	F15	98	Existed

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".

NO >> Repair or replace error-detected parts.

$\mathbf{3}$. CHECK THROTTLE POSITION SENSOR 2 GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check the continuity between electric throttle control actuator harness connector and ECM harness connector.

Electric throttle	control actuator	E	CM	Continuity
Connector	Terminal	Connector	Terminal	Continuity
F50	4	F15	75	Existed

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

Is the inspection result normal?

YES >> GO TO 4.

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

4.CHECK THROTTLE POSITION SENSOR 2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

 Check the continuity between electric throttle control actuator harness connector and ECM harness connector.

Electric throttle	control actuator	E	CM	Continuity
Connector	Terminal	Connector	Terminal	Continuity
F50	3	F15	72	Existed

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

Is the inspection result normal?

YES >> GO TO 5.

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

5.CHECK THROTTLE POSITION SENSOR

Check throttle position sensor. Refer to EC-220, "Component Inspection".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u>.

NO >> Replace electric throttle control actuator. Refer to EM-29, "Exploded View".

Component Inspection

INFOID:000000012406393

1. CHECK THROTTLE POSITION SENSOR

- 1. Turn ignition switch OFF.
- 2. Reconnect all harness connectors disconnected.
- 3. Perform EC-148. "Description".
- 4. Turn ignition switch ON.
- 5. Set selector lever to D position.
- 6. Check the voltage between ECM harness connector terminals under the following conditions.

P0122, P0123 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

	ECM				
Connector			Condition		Voltage
Connector	Terminal	Terminal			
	71			Fully released	More than 0.36 V
F15	(TP sensor 1 sig- nal)	75	A coolerator pedal	Fully depressed	Less than 4.75 V
FIJ	72	(Sensor ground)	Accelerator pedal	Fully released	Less than 4.75 V
	(TP sensor 2 sig- nal)			Fully depressed	More than 0.36 V

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace electric throttle control actuator. Refer to EM-29, "Exploded View".

[VQ35DE]

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P0125 ECT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P0125 ECT SENSOR

DTC Logic

DTC DETECTION LOGIC

NOTE:

- If DTC P0125 is displayed with P0116, first perform the trouble diagnosis for DTC P0116. Refer to <u>EC-</u> <u>215, "DTC Logic"</u>.
- If DTC P0125 is displayed with P0117 or P0118, first perform the trouble diagnosis for DTC P0117, P0118. Refer to <u>EC-217, "DTC Logic"</u>.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0125	Insufficient engine cool- ant temperature for closed loop fuel control	 Voltage sent to ECM from the sensor is not practical, even when some time has passed after starting the engine. Engine coolant temperature is insufficient for closed loop fuel control. 	 Harness or connectors (High resistance in the circuit) Engine coolant temperature sensor Thermostat

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

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

>> GO TO 2.

2.CHECK ENGINE COOLANT TEMPERATURE SENSOR FUNCTION

With CONSULT

- 1. Turn ignition switch ON.
- 2. Select "DATA MONITOR" mode with CONSULT.
- 3. Check that "COOLAN TEMP/S" is above 10°C (50°F).

With GST

Follow the procedure "With CONSULT" above.

Is the temperature above 10°C (50°F)?

- YES >> INSPECTION END
- NO >> GO TO 3.

3. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

1. Start engine and run it for 65 minutes at idle speed.

If "COOLAN TEMP/S" increases to more than 10°C (50°F) within 65 minutes, stop engine because the test result will be OK.

CAUTION: Never overheat engine.

2. Check 1st trip DTC.

With GST

Follow the procedure "With CONSULT" above.

Is 1st trip DTC detected?

- YES >> <u>EC-222</u>, "Diagnosis Procedure"
- NO >> INSPECTION END

Diagnosis Procedure

1.CHECK ENGINE COOLANT TEMPERATURE SENSOR

Check engine coolant temperature sensor. Refer to EC-223, "Component Inspection".

Revision: October 2015

EC-222

INFOID:000000012406395

[VQ35DE]

INFOID:000000012406394

2016 Quest

P0125 ECT SENSOR

		P01	25 ECT SENS	SOR	
< DTC/CIR	CUIT DIAGNOSIS >			[VQ35DE]	_
Is the inspe	ction result normal?				•
	GO TO 2.	ant tomporat			A
-	Replace engine cool		ure sensor.		
					EC
When the e	engine is cold [lower t lant does not flow.	han 70°C (1	58°F)] condition, g	grasp lower radiator hose and confirm that the	
0	ction result normal?				0
YES >>	· Check intermittent in				С
NO >>	Repair or replace the	ermostat. Ref	er to <u>CO-25, "Exp</u>	oloded View".	
Compone	ent Inspection			INFOID:00000001240639	; D
1 .снеск	ENGINE COOLANT	TEMPERATU	JRE SENSOR		
	nition switch OFF.				E
	nect engine coolant te e engine coolant temp				
	resistance between e				F
termina	als as per the following	J.			
Trantal				, , , , , , , , , , , , ,	
Terminals	Condition	20 (69)	Resistance (kΩ) 2.1 - 2.9		G
1 and 2	Temperature [°C (°F)]	20 (68)	0.68 - 1.00		
		90 (194)	0.236 - 0.260		Н
Is the inspe	ction result normal?		0.200 0.200		
	INSPECTION END			JMBIA0080ZZ	
NO >>	Replace engine coo		ature sensor. Ref	fer to	1
	CO-27, "Exploded Vi	<u>ew"</u> .			
					J
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< DTC/CIRCUIT DIAGNOSIS >

P0127 IAT SENSOR

INFOID:000000012406397

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0127	Intake air temperature too high	Rationally incorrect voltage from the sensor is sent to ECM, compared with the voltage signal from engine coolant temperature sensor.	 Harness or connectors (The sensor circuit is open or shorted) Intake air temperature sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

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

TESTING CONDITION:

This test may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

- 1. Wait until engine coolant temperature is less than 96°C (205°F)
- Turn ignition switch ON.
- Select "DATA MONITOR" mode with CONSULT.
- Check the engine coolant temperature.
- If the engine coolant temperature is not less than 96°C (205°F), turn ignition switch OFF and cool down engine.

NOTE:

Perform the following steps before engine coolant temperature is above 96°C (205°F).

- 2. Turn ignition switch ON.
- 3. Select "DATA MONITOR" mode with CONSULT.
- 4. Start engine.
- Hold vehicle speed at more than 70 km/h (43 MPH) for 100 consecutive seconds. CAUTION:

Always drive vehicle at a safe speed.

6. Check 1st trip DTC.

With GST

Follow the procedure "With CONSULT" above.

Is 1st trip DTC detected?

- YES >> Proceed to EC-224, "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000012406398

1.CHECK INTAKE AIR TEMPERATURE SENSOR

Check intake air temperature sensor. Refer to EC-225, "Component Inspection".

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u>.
- NO >> Replace mass air flow sensor (with intake air temperature sensor).

P0127 IAT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

Component Inspection

INFOID:000000012406399

[VQ35DE]

1.CHECK INTAKE AIR TEMPERATURE SENSOR

- 1. Turn ignition switch OFF.
- 2. Disconnect mass air flow sensor harness connector.
- 3. Check resistance between mass air flow sensor terminals as follows.

Terminals	Condition	Resistance (k Ω)	
1 and 2	Temperature [°C (°F)]	25 (77)	1.800 - 2.200

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace mass air flow sensor (with intake air temperature sensor). Refer to <u>EM-27, "Exploded</u> <u>View"</u>. A

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P0128 THERMOSTAT FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

P0128 THERMOSTAT FUNCTION

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P0128 is displayed with DTC P0300, P0301, P0302, P0303, P0304, P0305 or P0306, first perform the trouble diagnosis for P0300, P0301, P0302, P0303, P0304, P0305, P0306. Refer to EC-290, "DTC Logic".

Engine coolant temperature has not risen enough to open the thermostat even though the engine has run long enough.

This is due to a leak in the seal or the thermostat being stuck open.

DTC No.	Trouble diagnosis (Trouble diagnosis content)	DTC detecting condition	Possible cause
P0128	THERMSTAT FNCTN [Coolant thermostat (coolant temperature below thermostat regulating temperature)]	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

NOTE:

Never refuel before and during the following procedure.

1.PRECONDITIONING-I

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

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

>> GO TO 2.

2.PRECONDITIONING-II

With CONSULT 1. Turn ignition sv

- Turn ignition switch ON.
- 2. Check the following conditions:

Ambient temperature	–10°C (14°F) or more
A/C switch	OFF
Blower fan switch	OFF

Select "DATA MONITOR" mode of "ENGINE" using CONSULT. 3.

Check the following conditions: 4.

-10°C - 46°C (14 - 115°F)

Is the condition satisfied?

YES >> GO TO 3.

NO >> 1. Satisfy the condition.

2. GO TO 3.

3. PERFORM DTC CONFIRMATION PROCEDURE-I

(P)With CONSULT

- Start engine.
- Drive the vehicle until the following condition is satisfied. **CAUTION:**
- Always drive vehicle at safe speed.
- STEP 1

INFOID:000000012406400

P0128 THERMOSTAT FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

"FUEL T/TMP SE" become		
	r = r = r = r = r = r	
COOLAN TEMP/S	65°C (149°F) or less	
FUEL T/TMP SE	Less than the value calculated by sub- tracting 24°C (43°F) from "COOLAN TEMP/S".*	
*: Example		
COOLAN TEMP/S	FUEL T/TMP SE	
70°C (158°F)	45°C (113°F) or less	
65°C (149°F)	40°C (104°F) or less	
60°C (140°F)	35°C (95°F) or less	
T/TMP SE" maintained at NOTE: Keep the accelerator pedal a	(32 MPH) or more with the difference between "COOLAN TEMP/S" an 24°C (43°F) or more. s steady as possible during cruising.	d "FUEL
NOTE: Keep the accelerator pedal a	(32 MPH) or more until "COOLAN TEMP/S" increases by 6°C (11°F). s steady as possible during cruising.	
the condition satisfied? YES >> GO TO 4. NO >> GO TO 1.		
	ATION PROCEDURE-II	
With CONSULT	following condition is satisfied.	
With CONSULT Drive the vehicle until the COOLAN TEMP/S		
With CONSULT Drive the vehicle until the COOLAN TEMP/S CAUTION: Always drive vehicle at s Check 1st trip DTC. 1st trip DTC detected? YES >> Proceed to EC-22	following condition is satisfied. 65°C (149°F) or more safe speed. 7, "Diagnosis Procedure".	
With CONSULT Drive the vehicle until the COOLAN TEMP/S CAUTION: Always drive vehicle at s Check 1st trip DTC. 1st trip DTC detected? YES >> Proceed to EC-22 NO >> INSPECTION END	Following condition is satisfied. 65°C (149°F) or more safe speed. 7, "Diagnosis Procedure".	00000012406401
With CONSULT Drive the vehicle until the COOLAN TEMP/S CAUTION: Always drive vehicle at s Check 1st trip DTC. S 1st trip DTC detected? YES >> Proceed to EC-22 NO >> INSPECTION END Diagnosis Procedure	following condition is satisfied. 65°C (149°F) or more safe speed. 7, "Diagnosis Procedure".	00000012406401
With CONSULT Drive the vehicle until the COOLAN TEMP/S CAUTION: Always drive vehicle at s Check 1st trip DTC. 1st trip DTC detected? YES >> Proceed to EC-22 NO >> INSPECTION ENI Diagnosis Procedure CHECK ENGINE COOLAN heck engine coolant tempera the inspection result normal YES >> GO TO 2. NO >> Replace engine co	following condition is satisfied. 65°C (149°F) or more safe speed. 7, "Diagnosis Procedure". 0 INFOID 00 T TEMPERATURE SENSOR ture sensor. Refer to EC-227, "Component Inspection".	00000012406401
With CONSULT Drive the vehicle until the COOLAN TEMP/S CAUTION: Always drive vehicle at s Check 1st trip DTC. S 1st trip DTC detected? YES >> Proceed to EC-22 NO >> INSPECTION END Diagnosis Procedure .CHECK ENGINE COOLAN Check engine coolant tempera S the inspection result normal YES >> GO TO 2.	following condition is satisfied. 65°C (149°F) or more fafe speed. 7, "Diagnosis Procedure". T TEMPERATURE SENSOR ture sensor. Refer to EC-227, "Component Inspection". 2 bolant temperature sensor. D-25, "Exploded View".	00000012406401
With CONSULT Drive the vehicle until the COOLAN TEMP/S CAUTION: Always drive vehicle at s Check 1st trip DTC. 1st trip DTC detected? YES >> Proceed to EC-22 NO >> INSPECTION ENI Diagnosis Procedure CHECK ENGINE COOLAN check engine coolant tempera the inspection result normal YES >> GO TO 2. NO >> Replace engine co CHECK THERMOSTAT check thermostat. Refer to CC the inspection result normal YES >> INSPECTION ENI	following condition is satisfied. 65°C (149°F) or more fafe speed. 7, "Diagnosis Procedure". T TEMPERATURE SENSOR ture sensor. Refer to EC-227, "Component Inspection". Solution temperature sensor. -25, "Exploded View". 2	00000012406401
With CONSULT Drive the vehicle until the COOLAN TEMP/S CAUTION: Always drive vehicle at s Check 1st trip DTC. S 1st trip DTC detected? YES >> Proceed to EC-22 NO >> INSPECTION ENI Diagnosis Procedure CHECK ENGINE COOLAN CHECK ENGINE COOLAN CHECK ENGINE COOLAN CHECK ENGINE COOLAN CHECK THERMOSTAT CHECK THERMOSTAT CHECK THERMOSTAT CHECK THERMOSTAT	following condition is satisfied. 65°C (149°F) or more safe speed. 7, "Diagnosis Procedure". 0 T TEMPERATURE SENSOR ture sensor. Refer to EC-227, "Component Inspection". 2 polant temperature sensor. 2-25, "Exploded View". 2 at. Refer to CO-25, "Exploded View".	00000012406401

P0128 THERMOSTAT FUNCTION

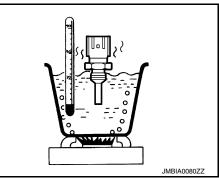
< DTC/CIRCUIT DIAGNOSIS >

- 1. Turn ignition switch OFF.
- 2. Disconnect engine coolant temperature sensor harness connector.
- 3. Remove engine coolant temperature sensor. Refer to CO-27, "Exploded View".
- 4. Check resistance between engine coolant temperature sensor terminals as per the following.

Terminals	Condition	Resistance (k Ω)	
		20 (68)	2.1 - 2.9
1 and 2		0.68 - 1.00	
		90 (194)	0.236 - 0.260

<u>Is the inspection result normal?</u> YES >> INSPECTION END

NO >> Replace engine coolant temperature sensor. Refer to <u>CO-27, "Exploded View"</u>.



< DTC/CIRCUIT DIAGNOSIS >

P0130, P0150 A/F SENSOR 1

Trouble diagnosis name

DTC Logic

DTC No.

DTC DETECTION LOGIC

To judge malfunctions, the diagnosis checks that the A/F signal computed by ECM from the A/F sensor 1 signal fluctuates according to fuel feedback control.

DTC detecting condition

DICINO.	nouble diagnosis name	1		r ussible cause	
P0130	Air fuel ratio (A/F) sensor 1 (bank 1) circuit		The A/F signal computed by ECM from the A/F sensor 1 signal is constantly in a range other than approx. 2.2 V.	Harness or connectors (The A/F sensor 1 circuit is open or shorted.)	
		B) The A/F signal computed by ECM from the A/F sensor 1 signal is constantly approx. 2.2 V.			
P0150 Air fuel ratio (A/F) sensor 1		A) The A/F signal computed by ECM from the A/F sensor 1 signal is constantly in a range other than approx. 2.2 V.		Harness or connectors (The A/F sensor 1 circuit is open er shorted)	
	(bank 2) circuit	B)	The A/F signal computed by ECM from the A/F sensor 1 signal is constantly approx. 2.2 V.	or shorted.) • A/F sensor 1	
	FIRMATION PROCE	DUF	RE		
.PRECO	NDITIONING				
		s be	en previously conducted, always perform	the following before conduct-	
ng the nex	t test. Inition switch OFF and w	vait	at least 10 seconds		
	inition switch OFF and w	vait	at least TO seconds.		
3. Turn ig	nition switch OFF and w	vait	at least 10 seconds.		
	CONDITION:				
setore per	rforming the following	pro	cedure, confirm that battery voltage is	more than 11 V at Idle.	
	00 70 0				
_	> GO TO 2.				
2. PERFO	RM DTC CONFIRMATIO	I NC	PROCEDURE FOR MALFUNCTION A		
		nor	mal operating temperature.		
	gine idle for 2 minutes. 1st trip DTC.				
	DTC detected?				
-	Proceed to <u>EC-231, "D</u>)iaaı	aosis Procedure"		
	> With CONSULT: GO T				
	> With GST: GO TO 7.				
3. СНЕСК	AIR FUEL RATIO (A/F)	SE	NSOR 1 FUNCTION		
			mal operating temperature. N1 (B2)" in "DATA MONITOR" mode with	CONSULT.	
	"A/F SEN1 (B1)" or "A/F				
Does the ir	ndication fluctuate aroun	d 2.	<u>2 V?</u>		
YES >>	> GO TO 4.				
NO >>	Proceed to <u>EC-231, "C</u>)iagı	nosis Procedure".		
1.PERFO	RM DTC CONFIRMATIO	NC NC	PROCEDURE FOR MALFUNCTION B-I		
1. Select SEN1"	"A/F SEN1 (B1) P1276 in "DTC WORK SUPPO	6" (f	or DTC P0130) or "A/F SEN1 (B2) P12	286" (for DTC P0150) of "A/F	
2. Touch	"START".				

3. When the following conditions are met, "TESTING" will be displayed on the CONSULT screen.

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[VQ35DE]

INFOID:000000012406403

Possible cause

< DTC/CIRCUIT DIAGNOSIS >

ENG SPEED	1,000 - 3,200 rpm
VHCL SPEED SE	More than 64 km/h (40 mph)
B/FUEL SCHDL	1.0 - 10.0 msec
Selector lever	D position

If "TESTING" is not displayed after 20 seconds, retry from step 2. CAUTION:

Always drive vehicle at a safe speed.

Is "TESTING" displayed on CONSULT screen?

YES >> GO TO 5.

NO >> Check A/F sensor 1 function again. GO TO 3.

5. PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION B-II

Release accelerator pedal fully.

NOTE:

Never apply brake when releasing the accelerator pedal.

Which does "TESTING" change to?

COMPLETED>>GO TO 6.

OUT OF CONDITION>>Retry DTC CONFIRMATION PROCEDURE. GO TO 4.

O.PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION B-III

Touch "SELF-DIAG RESULT".

Which is displayed on CONSULT screen?

OK >> INSPECTION END

NG >> Proceed to <u>EC-231, "Diagnosis Procedure"</u>.

1. PERFORM COMPONENT FUNCTION CHECK FOR MALFUNCTION B

Perform component function check. Refer to EC-230, "Component Function Check".

NOTE:

Use component function check to check the overall function of the A/F sensor 1 circuit. During this check, a 1st trip DTC might not be confirmed.

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Proceed to <u>EC-231, "Diagnosis Procedure"</u>.

Component Function Check

INFOID:000000012406404

1.PERFORM COMPONENT FUNCTION CHECK

With GST

- 1. Start engine and warm it up to normal operating temperature.
- 2. Drive the vehicle at a speed of 80 km/h (50 MPH) for a few minutes in the suitable gear position.
- 3. Shift the selector lever to the D position, then release the accelerator pedal fully until the vehicle speed decreases to 50 km/h (31 MPH).

CAUTION: Always drive vehicle at a safe speed. NOTE:

Never apply brake when releasing the accelerator pedal.

- 4. Repeat steps 2 and 3 for 5 times.
- 5. Stop the vehicle and turn ignition switch OFF.
- 6. Wait at least 10 seconds and restart engine.
- 7. Repeat steps 2 and 3 for 5 times.
- Stop the vehicle.
- 9. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to <u>EC-231, "Diagnosis Procedure"</u>.

NO >> INSPECTION END

Revision: October 2015

< DTC/CIRCUIT DIAGNOSIS >

Diagnosis Procedure

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

- 1. Disconnect A/F sensor 1 harness connector.
- 2. Turn ignition switch ON.

3. Check the voltage between A/F sensor 1 harness connector and ground.

DTC		A/F sensor 1	Ground	Voltage		
DIC	Bank	Connector	Terminal	Orbund	voltage	
P0130	1	F28	1	Ground	Battery voltage	
P0150	2	F65	1	Gibuliu	Ballery vollage	

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

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

1. Turn ignition switch OFF.

2. Disconnect IPDM E/R harness connector.

3. Check the continuity between A/F sensor 1 harness connector and IPDM E/R harness connector.

DTC	A/F sensor 1		IPDM E/R		Continuity		
ыс	Bank	Connector	Terminal	Connector	Terminal	Continuity	
P0130	1	F28	1	F12	57	57	Existed
P0150	2	F65	1	112	57	LAISteu	

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit.

NO >> Repair or replace error-detected parts.

3.CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.

3. Check the continuity between A/F sensor 1 harness connector and ECM harness connector.

DTC	A/F sensor 1			E	Continuity		
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity	
P0130	1	F28	3	F15	66		
F0130			4		67	Existed	
P0150	2 F65 -	2 565	3	115	76	LAISIEU	
F0150		4	-	77			

4. Check the continuity between A/F sensor 1 harness connector and ground, or ECM harness connector and ground.

DTC		A/F sensor 1	Ground	Continuity	
DIC	Bank	Connector	Terminal	Giouna	Continuity
P0130	1	F28	3		Not existed
F0130	I	F20	4	Ground	
P0150	C	E65	3	Giouna	
P0150	i0 2 F65		4		

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< DTC/CIRCUIT DIAGNOSIS >

DTC	EC	CM	Ground	Continuity	
DIC	Connector	Terminal	Ground	Continuity	
P0130		66			
F 0 1 3 0	F15	67	Ground	Not ovisted	
P0150	F15	76	Ground	Not existed	
F0150		77			

5. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 4.

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

4. CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace malfunctioning air fuel ratio (A/F) sensor 1. Refer to EM-34, "Exploded View".

NO >> Repair or replace error-detected parts.

< DTC/CIRCUIT DIAGNOSIS >

P0131, P0151 A/F SENSOR 1

DTC Logic

DTC DETECTION LOGIC

To judge the malfunction, the diagnosis checks that the A/F signal computed by ECM from the A/F sensor 1 signal is not inordinately low.

DTC No.	Trouble diagno	osis name	DTC detecting condition	Possible cause
P0131	Air fuel ratio (A/I (bank 1) circuit I	ow voltage	• The A/F signal computed by ECM from the A	
P0151	Air fuel ratio (A/I (bank 2) circuit I		F sensor 1 signal is constantly approx. 0 V.	shorted.) • A/F sensor 1
DTC CONF	IRMATION PI	ROCEDU	RE	
1.PRECON	DITIONING			
ing the next 1. Turn ign 2. Turn ign 3. Turn ign TESTING C	test. ition switch OF ition switch ON ition switch OF ONDITION:	F and wait F and wait	een previously conducted, always perfo at least 10 seconds. at least 10 seconds. ocedure, confirm that battery voltage	J
•	GO TO 2.			
2.CHECK A	VF SENSOR 1	FUNCTIO	Ν	
2. Select "/ 3. Check "/ With GST Follow the p Is the indicat YES >> NO >>	gine and warm A/F SEN1 (B1)' A/F SEN1 (B1)' rocedure "With tion constantly Proceed to <u>EC-</u> GO TO 3.	' or ['] A/F SI ' or "A/F SI CONSULT approx. 0 \ 234, "Diag	<u>/?</u> Inosis Procedure".	with CONSULT.
	M DTC CONFI	RMATION	PROCEDURE	
 Turn ign Turn ign 	ition switch OF ition switch ON ition switch OF	F, wait at le	east 10 seconds. east 10 seconds and then restart engin	
CAUTIC			ore than 40 km/h (25 MPH) within 20 s peed.	econds after restarting engine.
			for approximately 20 consecutive seco	nds.
ENG SPEED		1,000 - 3,20	00 rpm	
VHCL SPEED) SE	More than 4	40 km/h (25 mph)	

NOTE:

Selector lever

B/FUEL SCHDL

• Keep the accelerator pedal as steady as possible during cruising.

1.5 - 9.0 msec

Suitable position

- If this procedure is not completed within 1 minute after restarting engine at step 1, return to step 1.
- 6. Check 1st trip DTC.

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< DTC/CIRCUIT DIAGNOSIS >

With GST

Follow the procedure "With CONSULT" above.

Is 1st trip DTC detected?

YES >> Proceed to <u>EC-234. "Diagnosis Procedure"</u>.

NO >> INSPECTION END

Diagnosis Procedure

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

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

DTC		A/F sensor 1	Ground	Voltage		
DIC	Bank	Connector	Terminal	Oround	voltage	
P0131	1	F28	1	Ground	Batten voltage	
P0151	2	F65	1	Giouna	Battery voltage	

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

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

- 1. Turn ignition switch OFF.
- 2. Disconnect IPDM E/R harness connector.
- 3. Check the continuity between A/F sensor 1 harness connector and IPDM E/R harness connector.

DTC	A/F sensor 1			IPDN	Continuity	
ыс	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0131	1	F28	1	F12	57	Existed
P0151	2	F65	1	F IZ	57	Existed

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit.

NO >> Repair or replace error-detected parts.

${\it 3.}$ CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

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

DTC		A/F sensor 1			ECM		
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity	
P0131	1	F28	3		66		
FUIJI	I	F20	4	F15	67	Eviated	
P0151	2	F65	3	FIJ	76	Existed	
FUISI	2	F03	4		77		

4. Check the continuity between A/F sensor 1 harness connector and ground, or ECM harness connector and ground.

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< DTC/CIRCUIT DIAGNOSIS >

	A/F sensor 1			Que est	0
DTC	Bank	Connector	Terminal	Ground	Continuity
P0131	1	1 F28 3	3		
10101	I	120	4	Ground	Not existed
P0151	2	F65	3	Ground	NUL EXISTED
FUIJI	2 F00	4	1		

DTC	E	CM	Ground	Continuity
DIC	Connector	Terminal	Giouna	Continuity
P0131		66		
P0131	F 4 F	67	Cround	Not evicted
D0151	F15	76	Ground	Not existed
P0151		77		

Check intermittent incident. Refer to GI-41, "Intermittent Incident".

5. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 4.

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

4.CHECK INTERMITTENT INCIDENT

<u>Is the in</u>	spection result normal?
YES NO	>> Replace malfunctioning air fuel ratio (A/F) sensor 1. Refer to <u>EM-34, "Exploded View"</u> . >> Repair or replace error-detected parts.

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< DTC/CIRCUIT DIAGNOSIS >

P0132, P0152 A/F SENSOR 1

DTC Logic

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[VQ35DE]

DTC DETECTION LOGIC

To judge the malfunction, the diagnosis checks that the A/F signal computed by ECM from the A/F sensor 1 signal is not inordinately high.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0132	Air fuel ratio (A/F) sensor 1 (bank 1) circuit high voltage	The A/F signal computed by ECM from the A/F	Harness or connectors (The A/F sensor 1 circuit is open or
P0152	Air fuel ratio (A/F) sensor 1 (bank 2) circuit high voltage	sensor 1 signal is constantly approx. 5 V.	shorted.) • A/F sensor 1

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

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

2. Turn ignition switch ON.

3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10.5 V at idle.

>> GO TO 2.

2. CHECK A/F SENSOR 1 FUNCTION

With CONSULT

- 1. Start engine and warm it up to normal operating temperature.
- 2. Select "A/F SEN1 (B1)" or "A/F SEN1 (B2)" in "DATA MONITOR" mode with CONSULT.
- 3. Check "A/F SEN1 (B1)" or "A/F SEN1 (B2)" indication.

With GST

Follow the procedure "With CONSULT" above.

Is the indication constantly approx. 5 V?

YES >> Proceed to EC-237, "Diagnosis Procedure".

NO >> GO TO 3.

3. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF, wait at least 10 seconds and then restart engine.
- Drive and accelerate vehicle to more than 40 km/h (25 MPH) within 20 seconds after restarting engine. CAUTION:

Always drive vehicle at a safe speed.

5. Maintain the following conditions for approximately 20 consecutive seconds.

ENG SPEED	1,000 - 3,200 rpm
VHCL SPEED SE	More than 40 km/h (25 mph)
B/FUEL SCHDL	1.5 - 9.0 msec
Selector lever	Suitable position

NOTE:

- Keep the accelerator pedal as steady as possible during cruising.
- If this procedure is not completed within 1 minute after restarting engine at step 1, return to step
- Check 1st trip DTC.

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DTC/CIF		AGNOSIS	>					[VQ35D	E]
		e "With COI ted?	NSULT" a	above.					
'ES >>	Proceed	to <u>EC-237</u> TION END	<u>, "Diagno</u>	osis Proc	<u>edure"</u> .				
agnosi	s Proce	dure						INFOID:0000000124	06409
.CHECK	AIR FUE	L RATIO (A	VF) SEN	SOR 1 P	OWER SUF	PPLY			
Turn ig	nition swi ⁻				ness conne	ctor and g	round.		
DTC		A/F sensor 1		Groun	d Volta				
510	Bank	Connector	Terminal	Groun	u volla	iye			
P0132	1	F28	1	Groun	d Battery v	voltage			
P0152	2	F65	1						
'ES >> IO >>	ection result GO TO 3 GO TO 2 AIR FUE	3. 2.	VF) SEN	SOR 1 P	OWER SUF	PLY CIRC	CUIT		
ES >> O >> CHECK Turn ig Discon	> GO TO 3 > GO TO 2 AIR FUE nition swi	3. 2. L RATIO (A tch OFF. /I E/R harn nuity betwe	ess conn en A/F se	ector.	arness con	nector and		arness connector.	
ES >> O >> CHECK Turn ig Discon	> GO TO 3 > GO TO 2 AIR FUE Inition swi Inect IPDM the contir	3. 2. L RATIO (A tch OFF. /I E/R harn nuity betwe A/F so	ess conn en A/F se ensor 1	ector. ensor 1 h	arness coni IPDN	nector and		arness connector.	
ES O CHECK Turn ig Discon Check	> GO TO 3 > GO TO 2 AIR FUE nition swi	3. 2. L RATIO (A tch OFF. A E/R harn nuity betwe A/F so nk Con	ess conn en A/F se ensor 1	ector.	arness coni IPDN Connector	nector and /I E/R Terminal	I IPDM E/R ha	arness connector.	
ES >> IO >> .CHECK Turn ig Discon Check DTC	> GO TO 2 > GO TO 2 AIR FUE pnition swimect IPDM the contin	3. 2. L RATIO (A tch OFF. A E/R harn nuity betwe A/F so nk Com	ess conn en A/F se ensor 1 nector	ector. ensor 1 h Terminal	arness coni IPDN	nector and	I IPDM E/R ha	arness connector.	
ES >> O >> CHECK Turn ig Discon Check DTC P0132 P0152 the inspective ES >> O >> CHECK Turn ig Discon	 > GO TO 2 > GO TO 2 > GO TO 2 > AIR FUE mect IPDM the contin Ba 12 ection results > Perform > Repair o A/F SENS mect ECM 	3. 2. L RATIO (A tch OFF. A E/R harn nuity betwe A/F so nk Conn A/F so nk Conn nk Conn the trouble r replace e SOR 1 INP tch OFF. I harness c	ess conn en A/F se ensor 1 hector 28 65 diagnos rror-dete UT SIGN onnector	ector. ensor 1 h Terminal 1 is for pov cted part IAL CIRC	arness coni IPDM Connector F12 ver supply c s. CUIT FOR C	nector and // E/R Terminal 57 ircuit.	Continuity		
ES >> O >> CHECK Turn ig Discon Check DTC P0132 P0152 the inspective ES >> O >> CHECK Turn ig Discon	 > GO TO 2 > GO TO 2 > GO TO 2 > AIR FUE mect IPDM the contin Ba 12 ection results > Perform > Repair o A/F SENS mect ECM 	3. 2. L RATIO (A tch OFF. A E/R harn huity betwe A/F so A/F so A/F so A/F so A/F so N A/F so A/F	ess conn en A/F se ensor 1 hector 28 65 diagnos rror-dete UT SIGN onnector en A/F se	ector. ensor 1 h Terminal 1 is for pov cted part IAL CIRC	arness coni IPDM Connector F12 ver supply c s. CUIT FOR C arness coni	nector and // E/R Terminal 57 ircuit.	Continuity Existed		
ES >> O >> CHECK Turn ig Discon Check DTC P0132 P0152 the inspective ES >> O >> CHECK Turn ig Discon	 > GO TO 2 > GO TO 2 > GO TO 2 > AIR FUE mect IPDM the contin Ba 1 2 ection results > Perform > Perform > Repair o A/F SENS mect ECN the contin 	3. 2. L RATIO (A tch OFF. A E/R harn huity betwe A/F se A/F sensor A/F sensor	ess conn en A/F se ensor 1 hector 28 65 diagnos rror-dete UT SIGN onnector en A/F se 1	ector. ensor 1 h Terminal 1 is for pov cted part IAL CIRC : ensor 1 h	arness coni IPDM Connector F12 ver supply c s. CUIT FOR C arness coni ECM	nector and A E/R Terminal 57 ircuit. DPEN AND nector and	Continuity Existed		
ES >> O >> CHECK Turn ig Discon Check DTC P0132 P0152 the inspe ES >> O >> CHECK Turn ig Discon Check	 > GO TO 2 > GO TO 2 > GO TO 2 > AIR FUE mect IPDM the contin Ba 12 ection results > Perform > Repair o A/F SENS mect ECM 	3. 2. L RATIO (A tch OFF. A E/R harn huity betwe A/F so A/F so A/F so A/F so A/F so N A/F so A/F	ess conn en A/F se ensor 1 hector 28 65 diagnos rror-dete UT SIGN onnector en A/F se 1	ector. ensor 1 h Terminal 1 is for pov cted part IAL CIRC : ensor 1 h	arness coni IPDM Connector F12 ver supply c s. CUIT FOR C arness coni ECM	nector and A E/R Terminal 57 ircuit.	Continuity Existed		

and ground.

< DTC/CIRCUIT DIAGNOSIS >

DTC		A/F sensor 1			Continuity	
DIC	Bank	Connector	Terminal	Ground	Continuity	
P0132	1	F28	3			
F0132	I	120	4	Ground	Not existed	
D0152	C	F65	3	Ground	NOT EXISTED	
F0152	P0152 2		4			

DTC	EC	CM	Ground	Continuity
DIC	Connector	Terminal	Ground	Continuity
D0122		66		
P0132	F 4 F	67	Ground	Not existed
P0152	F15	76		
		77		

5. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 4.

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

4.CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace malfunctioning air fuel ratio (A/F) sensor 1. Refer to EM-34, "Exploded View".

NO >> Repair or replace error-detected parts.

< DTC/CIRCUIT DIAGNOSIS >

P0137, P0157 HO2S2

DTC Logic

DTC DETECTION LOGIC

The heated oxygen sensor 2 has a much longer switching time between rich and lean than the air fuel ratio (A/F) sensor 1. The oxygen storage capacity of the three way catalyst (manifold) causes the longer switching time. To judge the malfunctions of heated oxygen sensor 2, ECM monitors whether the maximum voltage of the sensor is sufficiently high during various driving conditions such as fuel-cut.

a : 0.72 V

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-		
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r		
	JSBIA4446GB	

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0137	Heated oxygen sensor 2 (bank 1) circuit low volt- age	The maximum voltage from the sensor does not	 Harness or connectors (The sensor circuit is open or shorted) Heated oxygen sensor 2
P0157	Heated oxygen sensor 2 (bank 2) circuit low volt- age	reach the specified voltage.	Fuel pressureFuel injectorIntake air leakage

DTC CONFIRMATION PROCEDURE

1.INSPECTION START

Will CONSULT be used?

Will CONSULT be used?

YES	>> GO TO 2.
NO	>> GO TO 5.

 $\mathbf{2}$

2.PRECONDITIONING

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

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

2. Turn ignition switch ON.

3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

For better results, perform "DTC WORK SUPPORT" at a temperature of 0 to 30°C (32 to 86°F).

>> GO	TO 3.
-------	-------

3. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

- 1. Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT.
- 2. Start engine and warm it up to the normal operating temperature.
- 3. Turn ignition switch OFF and wait at least 10 seconds.
- 4. Turn ignition switch ON.
- 5. Turn ignition switch OFF and wait at least 10 seconds.
- 6. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- 7. Let engine idle for 1 minute.
- 8. Check that "COOLAN TEMP/S" indicates more than 70°C (158°F).
- If not, warm up engine and go to next step when "COOLAN TEMP/S" indication reaches 70°C (158°F).
- 9. Open engine hood.

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< DTC/CIRCUIT DIAGNOSIS >

- 10. Select "HO2S2 (B1) P1147" (for DTC P0137) or "HO2S2 (B2) P1167" (for DTC P0157) of "HO2S2" in "DTC WORK SUPPORT" mode with CONSULT.
- 11. Follow the instruction of CONSULT display.
 - NOTE:

It will take at most 10 minutes until "COMPLETED" is displayed.

12. Touch "SELF-DIAG RESULTS".

Which is displayed on CONSULT screen?

OK >> INSPECTION END

NG >> Proceed to EC-241, "Diagnosis Procedure".

CAN NOT BE DIAGNOSED>>GO TO 4.

4.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

- 1. Turn ignition switch OFF and leave the vehicle in a cool place (soak the vehicle).
- 2. Perform DTC confirmation procedure again.

>> GO TO 3.

5.PERFORM COMPONENT FUNCTION CHECK

Perform component function check. Refer to <u>EC-240, "Component Function Check"</u>. **NOTE:**

Use component function check to check the overall function of the heated oxygen sensor 2 circuit. During this check, a 1st trip DTC might not be confirmed.

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Proceed to EC-241, "Diagnosis Procedure".

Component Function Check

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1.PERFORM COMPONENT FUNCTION CHECK-I

Without CONSULT

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

	ECM				
DTC	Connec-	+	_	Condition	Voltage
	tor	Terminal	Terminal		
P0137	— F14	41 [HO2S2 (bank 1) signal]	35 (Sensor	Revving up to 4,000 rpm under no load at least 10 times	The voltage should be above 0.72 V at least once during this procedure.
P0157		32 [HO2S2 (bank 2) signal]	ground)		

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.PERFORM COMPONENT FUNCTION CHECK-II

Check the voltage between ECM harness connector terminals under the following conditions.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

	ECM						
Connec-	+	-		Conditi	on	Voltage	
tor	Terminal	Terminal					
F14	41 [HO2S2 (bank 1) signal]	35	-	ng engine at id	le for 10 min-	The voltage should be above 0.72 V	
	32 [HO2S2 (bank 2) signal]	ground)	utes			at least once during this procedure.	
ection res	ult normal?						
voltage be	etween ECM hai	ness conr	nector t	erminals ur	der the follow	ving conditions.	
	FCM						
Connec-	+	_		Conditio	n	Voltage	
tor	Terminal	Terminal				5	
E14	41 [HO2S2 (bank 1) signal]	35	Coasting from 80 km/h (50 MPH) The voltage should be above 0.72 V				
F14	32 [HO2S2 (bank 2) signal]	(Sensor ground)				at least once during this procedure	
ection res	ult normal?						
		ianosis Pr	ocedur	e"			
			oocaai	<u> </u>			
	euure					INFOID:0000000124064	
	E RATIO SELF-L	EARNING	G VALU	JE			
				to <u>EC-151, '</u>	'Description"		
-			•				
					-		
		IS FOR DIC	P0171	or P0174.	Refer to EC-	<u>267, "DTC Logic"</u> .	
				אטה פאטש.	г		
					1		
nnect heat			ess con	nector.			
	nuity between h	eated oxy	/gen se	ensor 2 (HC	02S2) harnes	s connector and ECM harnes	
the conti ctor.	nuity between n						
	-		F	СМ			
	HO2S2	minal Cor	E	CM Terminal	Continuity		
	tor F14 ection res > INSPEC > GO TO > GO TO ORM COM voltage be Connec- tor F14 ection res > INSPEC > Proceed is	ConnectortorTerminal41 [HO2S2 (bank 1) signal]F14 32 [HO2S2 (bank 2) signal]ection result normal?> INSPECTION END> GO TO 3.DRM COMPONENT FUNCvoltage between ECM harConnectortortorECMConnectortorF14F14F14Better (Connector)tortortortorTerminal41 [HO2S2 (bank 1) signal]Better (HO2S2 (bank 1)) signal]Signal]ection result normal? (HO2S2 (bank 2)) signal]ection result normal? signal]> INSPECTION END > Proceed to EC-241, "Dial is ProcedureMIXTURE RATIO SELF-L the mixture ratio self-learn ngine for at least 10 minuted rip DTC P0171 or P0174 cores > Perform trouble diagnosi > GO TO 2.CHO2S2 GROUND CIRCU gnition switch OFF.	ConnectiontorTerminalTerminalF14 $\begin{array}{c} 41\\ [HO2S2 (bank 1)\\ signal] \\ \hline 32\\ [HO2S2 (bank 2)\\ signal] \\ \hline \end{array}35\\ (Sensorground) \\ \hline \end{array}Ection result normal?> INSPECTION END> GO TO 3.DRM COMPONENT FUNCTION CHIvoltage between ECM harness conrConnectiontorECMConnectiontorECMConnectiontorTerminalTerminalF14[HO2S2 (bank 1)signal]35(Sensorground)ection result normal?(HO2S2 (bank 2))signal]Proceed toECONECION result normal?signal]> INSPECTION END> Proceed to EC-241. "Diagnosis Pris Procedurea MIXTURE RATIO SELF-LEARNINGthe mixture ratio self-learning value.ngine for at least 10 minutes at idle stripDTC P0171 or P0174 detected?> Perform trouble diagnosis for DTC> GO TO 2.C HO2S2 GROUND CIRCUIT FOR Cgnition switch OFF.$	ConnectiontorTerminalTerminalF14 $\begin{bmatrix} HO2S2 (bank 1) \\ signal \end{bmatrix}$ $35 \\ (Sensor ground) \end{bmatrix}$ Keepin utesection result normal? > INSPECTION END > GO TO 3.INSPECTION END > GO TO 3.Sensor connector the section result normal?voltage between ECM harness connector to the signal Between ECM harness connector the signal Between ECM Harnes Between ECM	Connection tor Terminal Terminal F14 $\begin{bmatrix} HO2S2 (bank 1) \\ signal \end{bmatrix}$ $35 \\ (Sensor ground)$ Keeping engine at id ection result normal? 32 ground) Keeping engine at id ection result normal? signal] 35 Keeping engine at id Proced 32 ground) Keeping engine at id voltage between ECM harness connector terminals un ECM Condition voltage terminal Terminal F14 ECM Condition for Terminal Terminal F14 $\begin{bmatrix} HO2S2 (bank 1) \\ signal \end{bmatrix}$ $35 \\ (Sensor ground)$ F14 $\begin{bmatrix} 41 \\ (HO2S2 (bank 2) \\ signal \end{bmatrix}$ $35 \\ (Sensor ground)$ Coasting from 80 km/ with selector lever in the selector lever i	Contraction tor Terminal Terminal F14 $\begin{bmatrix} O2S2 (bank 1) \\ signal \\ 32 \\ [O2S2 (bank 2) \\ signal \\ 32 \\ [O2S2 (bank 2) \\ signal \\ 32 \\ [O2S2 (bank 2) \\ signal \\ 7 \\ > INSPECTION END \\> GO TO 3. Keeping engine at idle for 10 minutes ection result normal? > INSPECTION END > GO TO 3. Keeping engine at idle for 10 minutes PRM COMPONENT FUNCTION CHECK-III voltage between ECM harness connector terminals under the follow Connector + - Condition tor Terminal Terminal Condition F14 [HO2S2 (bank 1)] signal] 35 (Sensor ground) Coasting from 80 km/h (50 MPH) with selector lever in the D position F14 [HO2S2 (bank 2)] signal] 35 (Sensor ground) Coasting from 80 km/h (50 MPH) with selector lever in the D position ection result normal? > Sensor ground) Sensor ground) signal] 35 (Sensor ground) Coasting from 80 km/h (50 MPH) with selector lever in the D position ection result normal? Sensor ground) Sensor ground) Sensor ground) Proceed to EC-241. "Diagnosis Procedure". Sensor ground) Sensor ground) Sensor ground) MIXTURE RATIO SELF-LEARNING VALUE Sensor ground) $	

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

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Is the inspection result normal?

2

YES >> GO TO 3.

P0157

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

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< DTC/CIRCUIT DIAGNOSIS >

$\overline{\mathbf{3}}$.check ho2s2 input signal circuit for open and short

1. Check the continuity between HO2S2 harness connector and ECM harness connector.

DTC	HO2S2			E	Continuity	
ыс	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0137	1	F86	3	F14	41	Existed
P0157	2	F85	3	F 14	32	Existed

2. Check the continuity between HO2S2 harness connector and ground, or ECM harness connector and ground.

DTC			Ground	Continuity	
DIC	Bank	Connector	Terminal	Orbund	Continuity
P0137	1	F86	3	Ground	Not existed
P0157	2	F85	3	Ground	

DTC	E	СМ	Ground	Continuity	
DIC	Connector	Terminal	Cround	Continuity	
P0137	F14	41	Ground	Not existed	
P0157	1 14	32	Ground	NUL EXISLEU	

3. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 4.

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

4.CHECK HEATED OXYGEN SENSOR 2

Check heated oxygen sensor 2. Refer to EC-242, "Component Inspection".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u>.

NO >> Replace malfunctioning heated oxygen sensor 2. Refer to EM-34, "Exploded View".

Component Inspection

INFOID:000000012406413

1.INSPECTION START

Will CONSULT be used?

Will CONSULT be used?

YES >> GO TO 2.

NO >> GO TO 3.

2. CHECK HEATED OXYGEN SENSOR 2

With CONSULT

- 1. Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT.
- 2. Start engine and warm it up to the normal operating temperature.
- 3. Turn ignition switch OFF and wait at least 10 seconds.
- 4. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- 5. Let engine idle for 1 minute.
- 6. Select "FUEL INJECTION" in "ACTIVE TEST" mode, and select "HO2S2 (B1)/(B2)" as the monitor item with CONSULT.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

А

EC

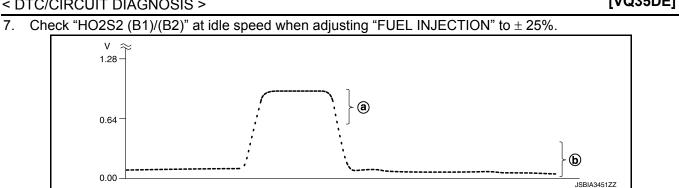
D

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"HO2S2 (B1)/(B2)" should be above (a) 0.72 V at least once when the "FUEL INJECTION" is + 25%. "HO2S2 (B1)/(B2)" should be below (b 0.27 V at least once when the "FUEL INJECTION" is – 25%.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace malfunctioning heated oxygen sensor 2. Refer to <u>EM-34, "Exploded View"</u>.

3.CHECK HEATED OXYGEN SENSOR 2-I

Without CONSULT

- Start engine and warm it up to the normal operating temperature. 1.
- 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. 3.
- 4. Let engine idle for 1 minute.
- Check the voltage between ECM harness connector terminals under the following conditions. 5.

	ECM				
Connector	+	-	Condition	Voltage	
Connector	Terminal	Terminal			
F14	41 [HO2S2 (bank 1) signal]	35 (Sensor	Revving up to 4,000 rpm under no load at	The voltage should be above 0.72 V at least once during this procedure.	
Г 14	32 [HO2S2 (bank 2) signal]	ground)	least 10 times	The voltage should be below 0.27 V at least once during this procedure.	

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 4.

4.CHECK HEATED OXYGEN SENSOR 2-II

Check the voltage between ECM harness connector terminals under the following conditions.

	ECM				
Connector	+	-	Condition	Voltage	
Connector	Terminal	Terminal			
F14 -	41 [HO2S2 (bank 1) signal]	35 (Sanaar		The voltage should be above 0.72 V at least once during this procedure.	
F 14	32 [HO2S2 (bank 2) signal]	(Sensor ground)	Keeping engine at idle for 10 minutes	The voltage should be below 0.27 V at least once during this procedure.	

the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 5.

5.CHECK HEATED OXYGEN SENSOR 2-III

Check the voltage between ECM harness connector terminals under the following conditions.

< DTC/CIRCUIT DIAGNOSIS >

	ECM			
Connector	+	-	Condition	Voltage
Connector	Terminal	Terminal		
F14	41 [HO2S2 (bank 1) signal]	35 (Sensor	Coasting from 80 km/h (50 MPH) with se-	The voltage should be above 0.72 V at least once during this procedure.
1 14	32 [HO2S2 (bank 2) signal]	ground)	lector lever in the D position	The voltage should be below 0.27 V at least once during this procedure.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace malfunctioning heated oxygen sensor 2. Refer to EM-34, "Exploded View".

< DTC/CIRCUIT DIAGNOSIS >

P0138, P0158 HO2S2

DTC Logic

[VQ35DE]

EC

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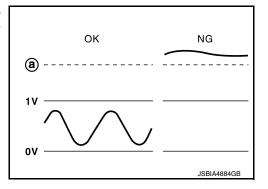
DTC DETECTION LOGIC

The heated oxygen sensor 2 has a much longer switching time between rich and lean than the air fuel ratio (A/ F) sensor 1. The oxygen storage capacity of the three way catalyst (manifold) causes the longer switching time.

MALFUNCTION A

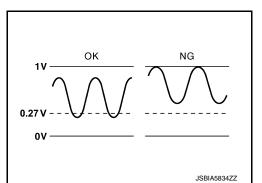
To judge the malfunctions of heated oxygen sensor 2, ECM monitors whether the voltage is unusually high during various driving conditions such as fuel cut.

a : 1.3 V



MALFUNCTION B

To judge the malfunctions of heated oxygen sensor 2, ECM monitors whether the minimum voltage of sensor is sufficiently low during various driving conditions such as fuel-cut.



DTC No.	Trouble diagnosis name		DTC detecting condition	Possible cause
	Heated oxygen sensor 2	A)	An excessively high voltage from the sen- sor is sent to ECM.	 Harness or connectors (The sensor circuit is open or shorted) Heated oxygen sensor 2
P0138	(bank 1) circuit high volt- age	B)	The minimum voltage from the sensor is not reached to the specified voltage.	 Harness or connectors (The sensor circuit is open or shorted) Heated oxygen sensor 2 Fuel pressure Fuel injector
	Heated oxygen sensor 2	A)	An excessively high voltage from the sen- sor is sent to ECM.	 Harness or connectors (The sensor circuit is open or shorted) Heated oxygen sensor 2
P0158	(bank 2) circuit high volt- age	B)	The minimum voltage from the sensor is not reached to the specified voltage.	 Harness or connectors (The sensor circuit is open or shorted) Heated oxygen sensor 2 Fuel pressure Fuel injector

Р

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

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

< DTC/CIRCUIT DIAGNOSIS >

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION A

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

Is 1st trip DTC detected?

- YES >> Proceed to EC-248, "Diagnosis Procedure".
- NO-1 >> With CONSULT: GO TO 3.
- NO-2 >> Without CONSULT: GO TO 5.

3. PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION B

NOTE:

For better results, perform "DTC WORK SUPPORT" at a temperature of 0 to 30°C (32 to 86°F).

- 1. Select "DATA MONITOR" mode with CONSULT.
- 2. Start engine and warm it up to the normal operating temperature.
- 3. Turn ignition switch OFF and wait at least 10 seconds.
- 4. Turn ignition switch ON.
- 5. Turn ignition switch OFF and wait at least 10 seconds.
- 6. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- 7. Let engine idle for 1 minute.
- Check that "COOLAN TEMP/S" indicates more than 70°C (158°F). If not, warm up engine and go to next step when "COOLAN TEMP/S" indication reaches 70°C (158°F).
- 9. Open engine hood.
- 10. Select "HO2S2 (B1) P1146" (for DTC P0138) or "HO2S2 (B2) P1166" (for DTC P0158) of "HO2S2" in "DTC WORK SUPPORT" mode with CONSULT.
- 11. Follow the instruction of CONSULT display.
- NOTE:
 - It will take at most 10 minutes until "COMPLETED" is displayed.
- 12. Touch "SELF-DIAG RESULTS".

Which is displayed on CONSULT screen?

OK >> INSPECTION END

NG >> Proceed to EC-248, "Diagnosis Procedure".

CON NOT BE DIAGNOSED>>GO TO 4.

4.PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION B AGAIN

- 1. Turn ignition switch OFF and leave the vehicle in a cool place (soak the vehicle).
- 2. Perform DTC confirmation procedure again.

>> GO TO 3.

5. PERFORM COMPONENT FUNCTION CHECK FOR MALFUNCTION B

Perform component function check. Refer to EC-246, "Component Function Check".

NOTE:

Use component function check to check the overall function of the heated oxygen sensor 2 circuit. During this check, a 1st trip DTC might not be confirmed.

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Proceed to <u>EC-248, "Diagnosis Procedure"</u>.

Component Function Check

1.PERFORM COMPONENT FUNCTION CHECK-I

INFOID:000000012406415

< DTC/CIRCUIT DIAGNOSIS >

Without CONSULT

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

		ECM				
DTC	Connec-	+	-	Condition	Voltage	D
	tor	Terminal	Terminal			
P0138	F14	41 [HO2S2 (bank 1) signal]	35 (Sensor	Revving up to 4,000 rpm under no	The voltage should be below 0.27 V	E
P0158	1 14	32 [HO2S2 (bank 2) signal]	ground)	load at least 10 times	at least once during this procedure.	F

Is the inspection result normal?

>> INSPECTION END YES

NO >> GO TO 2.

2.PERFORM COMPONENT FUNCTION CHECK-II

Check the voltage between ECM harness connector terminals under the following conditions.

		ECM				
DTC	Connec-	+	_	Condition	Voltage	
	tor	Terminal	Terminal			
P0138	F14	41 [HO2S2 (bank 1) signal]	35 (Sensor	Keeping engine speed at idle for 10	The voltage should be below 0.27 V	J
P0158	- F14	32 [HO2S2 (bank 2) signal]	ground)	minutes	at least once during this procedure.	K

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 3.

3. PERFORM COMPONENT FUNCTION CHECK-III

Check the voltage between ECM harness connector terminals under the following conditions.

		ECM				
DTC	Connec-	+	-	Condition	Voltage	
	tor	Terminal	Terminal			
P0138	F14	41 [HO2S2 (bank 1) signal]	35 (Sensor	Coasting from 80 km/h (50 MPH)	The voltage should be below 0.27 V	
P0158	1 14	32 [HO2S2 (bank 2) signal]	ground)	with selector lever in the D position	at least once during this procedure.	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to EC-248, "Diagnosis Procedure".

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< DTC/CIRCUIT DIAGNOSIS >

Diagnosis Procedure

[VQ35DE]

1.INSPECTION START

Confirm the detected malfunction (A or B). Refer to <u>EC-245, "DTC Logic"</u>.

Which malfunction is detected?

A >> GO TO 2.

B >> GO TO 6.

2.CHECK HO2S2 CONNECTOR FOR WATER

1. Disconnect heated oxygen sensor 2 harness connector.

2. Check that water is not inside connectors.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace harness or connectors.

 $\mathbf{3}$.check ho2s2 ground circuit for open and short

1. Disconnect heated oxygen sensor 2 harness connector.

2. Disconnect ECM harness connector.

3. Check the continuity between heated oxygen sensor 2 (HO2S2) harness connector and ECM harness connector.

DTC		HO2S2		E	CM	Continuity
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0138	1	F86	4	F14	35	Existed
P0158	2	F85	4	1 14	55	LAIsted

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

Is the inspection result normal?

YES >> GO TO 4.

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

4.CHECK HO2S2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between HO2S2 harness connector and ECM harness connector.

DTC		HO2S2		E	CM	Continuity
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0138	1	F86	3	F14	41	Existed
P0158	2	F85	3	F 14	32	Existed

2. Check the continuity between HO2S2 harness connector and ground, or ECM harness connector and ground.

DTC		HO2S2		Ground	Continuity
DIC	Bank	Connector	Terminal	Ground	Continuity
P0138	1	F86	3	Ground	Not existed
P0158	2	F85	3	Orbuild	NUL EXISTED

DTC	E	CM	Ground	Continuity	
DIC	Connector Terminal		Ground	Continuity	
P0138	F14	41	Ground	Not existed	
P0158	1 14	32	Ground	NUL EXISIEU	

3. Also check harness for short to power. <u>Is the inspection result normal?</u>

Revision: October 2015

			P	0138, P0)158 HO2	2S2		
< DTC/CI		AGNOSIS		,			[VQ35DE]	
	> GO TO 5							
_			-		ort to power	r in harness o	or connectors.	А
		OXYGEN						
			Refer to	<u>EC-250, "Co</u>	omponent In	spection".		EC
		<u>ult normal?</u>						
						ent Incident" fer to EM-34	"Exploded View".	
~	•		-	NING VALU				С
						"Description"		
		it least 10 n			lo <u>ec-151,</u>	'Description"		D
	-			•	ficult to start	t engine?		
			gnosis for	DTC P0172	2, P0175. Re	efer to EC-27	<u>1, "DTC Logic"</u> .	_
_	> GO TO 7		_					E
1.CHECK	KHO2S2 G	BROUND C	IRCUIT FO	OR OPEN A	AND SHOR	Τ		
	gnition swi		aanaar 0 h		nantar			F
		l harness c		arness con	nector.			
				harness co	onnector and	d ECM harne	ss connector.	
	1							G
DTC		HO2S2			СМ	Continuity		
	Bank	Connector	Terminal	Connector	Terminal			Н
P0138	1	F86	4	F14	35	Existed		
P0158	2	F85	4		40 00000			I
		ess for sho ult normal?	rt to ground	d and short	to power.			1
	> GO TO 8							
-		-	short to g	round or sh	ort to power	r in harness o	or connectors.	J
8.CHEC	K HO2S2 II	NPUT SIGN	VAL CIRCU	JIT FOR OI	PEN AND S	HORT		
1. Check	the contir	uity betwee	en HO2S2	harness co	onnector and	d ECM harne	ss connector.	K
DTC		HO2S2		E	СМ	Continuity		
	Bank	Connector	Terminal	Connector	Terminal			L
P0138	1	F86	3	F14	41	Existed		
P0158	2	F85	3		32			M
2. Check groun		nuity betwe	en HO2S	2 harness o	connector a	ind ground,	or ECM harness connector and	
groun	u.							NI
		HO2S2				_		Ν
DTC	Bank	Connector	Terminal	Ground	Continuity			
P0138	1	F86	3		N I I I I I I I I I I			0
P0158	2	F85	3	Ground	Not existed			
		·				-		Р
DTC	E	ECM	Ground	l Continu	iitv			T.
DIC	Connector	Terminal	Ground		iity			

	Connector	Ierminal		
P0138	F14	41	Ground	Not existed
P0158	1 14	32	Ground	NUL EXISTED

3. Also check harness for short to power.

Is the inspection result normal?

Revision: October 2015

< DTC/CIRCUIT DIAGNOSIS >

- YES >> GO TO 9.
- NO >> Repair open circuit, short to ground or short to power in harness or connectors.

9.CHECK HEATED OXYGEN SENSOR 2

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u>.
- NO >> Replace malfunctioning heated oxygen sensor 2. Refer to EM-34. "Exploded View".

Component Inspection

1.INSPECTION START

Will CONSULT be used?

Will CONSULT be used?

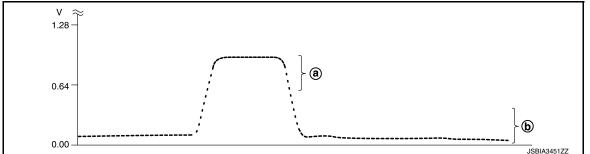
YES >> GO TO 2.

NO >> GO TO 3.

2.CHECK HEATED OXYGEN SENSOR 2

With CONSULT

- Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT.
- 2. Start engine and warm it up to the normal operating temperature.
- 3. Turn ignition switch OFF and wait at least 10 seconds.
- 4. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- 5. Let engine idle for 1 minute.
- Select "FUEL INJECTION" in "ACTIVE TEST" mode, and select "HO2S2 (B1)/(B2)" as the monitor item with CONSULT.
- 7. Check "HO2S2 (B1)/(B2)" at idle speed when adjusting "FUEL INJECTION" to \pm 25%.



"HO2S2 (B1)/(B2)" should be above (a) 0.72 V at least once when the "FUEL INJECTION" is + 25%. "HO2S2 (B1)/(B2)" should be below (b) 0.27 V at least once when the "FUEL INJECTION" is – 25%.

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Replace malfunctioning heated oxygen sensor 2. Refer to EM-34, "Exploded View".

3.CHECK HEATED OXYGEN SENSOR 2-I

Without CONSULT

- i. Start engine and warm it up to the normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- 4. Let engine idle for 1 minute.
- 5. Check the voltage between ECM harness connector terminals under the following conditions.

INFOID:000000012406417

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

	ECM				
Connector	+	-	Condition	Voltage	
Connector	Terminal	Terminal			
F14	41 [HO2S2 (bank 1) signal] 32 [HO2S2 (bank 2) signal]	35 (Sensor ground)	Revving up to 4,000 rpm under no load at least 10 times	The voltage should be above 0.72 V at least once during this procedure. The voltage should be below 0.27 V at least once during this procedure.	
<u>s the inspe</u>	ection result norr	<u>nal?</u>			
NO >>	 INSPECTION I GO TO 4. 				
1. CHECK	HEATED OXYG	SEN SENS	SOR 2-II		
Check the v	voltage between	ECM har	ness connector terminals under the	following conditions.	
	ECM				
Connector	+	-	Condition	Voltage	
	Terminal	Terminal			
F14	41 [HO2S2 (bank 1) signal] 32	35 (Sensor	Keeping engine at idle for 10 minutes	The voltage should be above 0.72 V at least once during this procedure. The voltage should be below 0.27 V at	
	32 [HO2S2 (bank 2) signal]	ground)		least once during this procedure.	
<u>s the inspe</u>	ection result norr	nal?			
	 INSPECTION I GO TO 5. 	END			
5. CHECK	HEATED OXYG	SEN SENS	SOR 2-III		
Check the	voltage between	ECM har	ness connector terminals under the	following conditions.	
	ECM				
Connector	+	_	Condition	Voltage	
Connector	Terminal	Terminal			
F14	41 [HO2S2 (bank 1) signal] 32 [HO2S2 (bank 2)	35 (Sensor ground)	Coasting from 80 km/h (50 MPH) with se- lector lever in the D position	The voltage should be above 0.72 V at least once during this procedure. The voltage should be below 0.27 V at least once during this procedure.	
a tha inana	signal]	200			
<u>s the inspe</u>	ection result norr INSPECTION I				
			neated oxygen sensor 2. Refer to EN	<u>1-34, "Exploded View".</u>	
			neated oxygen sensor 2. Refer to $\underline{\sf EN}$	<u>//-34, "Exploded View"</u> .	

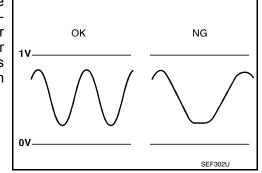
< DTC/CIRCUIT DIAGNOSIS >

P0139, P0159 HO2S2

DTC Logic

DTC DETECTION LOGIC

The heated oxygen sensor 2 has a much longer switching time between rich and lean than the air fuel ratio (A/F) sensor 1. The oxygen storage capacity of the three way catalyst 1 causes the longer switching time. To judge the malfunctions of heated oxygen sensor 2, ECM monitors whether the switching response of the sensor's voltage is faster than specified during various driving conditions such as fuel cut.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0139	Heated oxygen sensor 2 (bank 1) circuit slow re- sponse	The switching time between rich and lean of a heated oxygen sensor 2 signal delays more	 Harness or connectors (The sensor circuit is open or shorted) Heated oxygen sensor 2 Fuel system EVAP system Intake air system
P0159	Heated oxygen sensor 2 (bank 2) circuit slow re- sponse	than the specified time computed by ECM.	

DTC CONFIRMATION PROCEDURE

1.INSPECTION START

Do you have CONSULT?

Do you have CONSULT?

YES	>> GO TO 2.
NO	>> GO TO 7.

2.PRECONDITIONING

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

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

TESTING CONDITION:

For better results, perform "DTC WORK SUPPORT" at a temperature of 0 to 30°C (32 to 86°F).

>> GO TO 3.

3. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

- 1. Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT.
- 2. Start engine and warm it up to the normal operating temperature.
- 3. Turn ignition switch OFF and wait at least 10 seconds.
- 4. Turn ignition switch ON.
- 5. Turn ignition switch OFF and wait at least 10 seconds.
- 6. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- 7. Let engine idle for 1 minute.
- 8. Make sure that "COOLAN TEMP/S" indicates more than 70°C (158°F).
- 9. Drive the vehicle in a proper gear at 60 km/h (38MPH) and maintain the speed.
 - CAUTION: Always drive vehicle at a safe speed.

EC-252

[VQ35DE]

	P0'	139, P0159 HO2S2	2
< DTC/CIRCU	IT DIAGNOSIS >		[VQ35DE]
	ne accelerator pedal fully at lea	ast 5 seconds.	
• Enable f	: he engine brake.		
 Always 	drive carefully.		
	pply brake when releasing t	he accelerator pedal.	
	ep 9 and 10 at least 8 times. following item of "DATA MON	IITOR".	
DTC	Data monitor item	Status	-
P0139	HO2 S2 DIAG1 (B1)		-
10133	HO2 S2 DIAG2 (B1)	CMPLT	
P0159	HO2 S2 DIAG1 (B2)		
1 0100	HO2 S2 DIAG2 (B2)		_
	played on CONSULT screen?	2	
	D TO 6. T" is not displayed on DIAC 1		ation procedure again
	T" is not displayed on DIAG 1 T" is not displayed on DIAG 2		alion procedure again.
4	DTC WORK SUPPORT		
I. Open engi			
		(B2) P0159" of "HO2S2	2" in "DTC WORK SUPPORT" mode with
CONSULT			
 Start engin NOTE: 	e and follow the instruction of	CONSULT display.	
-	at most 10 minutes until "CON	MPLETED" is displayed.	
<u>s "COMPLETE</u>	ED" displayed on CONSULT s	screen?	
	D TO 6.		
_	D TO 5.		
	DTC CONFIRMATION PROC		<u> </u>
	on switch OFF and leave the v TC confirmation procedure ac		oak the vehicle).
		Juni	
>> G(D TO 3.		
3. PERFORM	SELF-DIAGNOSIS		
With CONS			
Perform ECM			
<u>s DTC "P0139</u>	" or "P0159" detected?		
	oceed to EC-255, "Diagnosis	Procedure".	
	SPECTION END		
	COMPONENT FUNCTION C		
Perform compo NOTE:	onent function check. Refer to	EC-253, "Component F	unction Check".
Use componer	nt function check to check the p DTC might not be confirmed		eated oxygen sensor 2 circuit. During this
	on result normal?		
	SPECTION END	D	
	oceed to <u>EC-255, "Diagnosis</u>	Procedure".	
Component	Function Check		INFCID:000000012406419
.PERFORM	COMPONENT FUNCTION C	HECK-I	

Without CONSULT

1. Start engine and warm it up to the normal operating temperature.

EC-253

< DTC/CIRCUIT DIAGNOSIS >

- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Turn ignition switch ON.
- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- 6. Let engine idle for 1 minute.
- 7. Check the voltage between ECM harness connector terminals under the following conditions.

		ECM			
DTC	Connec-	+	-	Condition	Voltage
	tor	Terminal	Terminal		
P0139	F14	41 [HO2S2 (bank 1) signal]	35 (Sensor	Revving up to 4,000 rpm under no	A change of voltage should be more than 0.56 V for 1 second during this
P0159	Г 14	32 [HO2S2 (bank 2) signal]	ground)	load at least 10 times	procedure.

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.PERFORM COMPONENT FUNCTION CHECK-II

Check the voltage between ECM harness connector terminals under the following conditions.

		ECM			
DTC	Connec-	+	-	Condition	Voltage
	tor	Terminal	Terminal		
P0139	F14	41 [HO2S2 (bank 1) signal]	35 (Sensor	Keeping engine at idle for 10 minutes	A change of voltage should be more than 0.56 V for 1 second during this
P0159	F 14	32 [HO2S2 (bank 2) signal]	ground)		procedure.

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 3.

3. PERFORM COMPONENT FUNCTION CHECK-III

Check the voltage between ECM harness connector terminals under the following conditions.

		ECM			
DTC	Connec-	+	-	Condition	Voltage
	tor	Terminal	Terminal	*	
P0139	F14	41 [HO2S2 (bank 1) signal]	35 (Sensor	Coasting from 80 km/h (50 MPH) in	A change of voltage should be more than 0.56 V for 1 second during this
P0159	Г 14	32 [HO2S2 (bank 2) signal]	ground)	D position	procedure.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to EC-255, "Diagnosis Procedure".

>> Perform trouble diagnosis for DTC P0171, P0174 or P0172, P0175. Refer to EC-267, "DTC Logic"

NO	>> Repair open circuit, shor
4	

4.CHECK HEATED OXYGEN SENSOR 2

3. 4.		the contin	harness c nuity betwe		l oxygen s	ensor 2 (HC	02S2) harne	ess connector and ECM harness
	DTC		HO2S2		E	CM	Continuity	' '
	ыс	Bank	Connector	Terminal	Connector	Terminal	Continuity	
I	P0139	1	F86	4	F14	35	Existed	•
					, <u>, , , ,</u>	55	LAISICU	

4

Clear the mixture ratio self-learning value. Refer to EC-151, "Description".

Is the 1st trip DTC P0171, P0172, P0174 or P0175 detected? Is it difficult to start engine?

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

F85

Is the inspection result normal?

2

< DTC/CIRCUIT DIAGNOSIS >

>> GO TO 2.

Turn ignition switch OFF.

1.CLEAR MIXTURE RATIO SELF-LEARNING VALUE

Run engine for at least 10 minutes at idle speed.

2.CHECK HO2S2 GROUND CIRCUIT FOR OPEN AND SHORT

Disconnect heated oxygen sensor 2 harness connector.

or EC-271, "DTC Logic".

Diagnosis Procedure

1.

2.

YES

NO

1.

2.

YES >> GO TO 3.

P0159

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

3.CHECK HO2S2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

Check the continuity between HO2S2 harness connector and ECM harness connector. 1.

-	DTC		HO2S2		E	CM	Continuity
	DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity
	P0139	1	F86	3	F14	41	Existed
	P0159	2	F85	3	F 14	32	Existed

2. Check the continuity between HO2S2 harness connector and ground, or ECM harness connector and ground.

DTC		HO2S2		Ground	Continuity
DIC	Bank	Connector	Terminal	Ground	Continuity
P0139	1	F86	3	Ground	Not existed
P0159	2	F85	3	Ground	NUL EXISIEU

DTC	E	CM	Ground	Continuity
ыс	Connector	Terminal	Ground	Continuity
P0139	F14	41	Ground	Not existed
P0159	F 14	32	Ground	NUL EXISTEN

3. Also check harness for short to power.

YES >> GO TO 4.

Is the inspection result normal?

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

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< DTC/CIRCUIT DIAGNOSIS >

Check heated oxygen sensor 2. Refer to EC-256, "Component Inspection".

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
- NO >> Replace malfunctioning heated oxygen sensor 2. Refer to <u>EM-34</u>, "<u>Exploded View</u>".

Component Inspection

INFOID:000000012406421

[VQ35DE]

1.INSPECTION START

Will CONSULT be used?

Will CONSULT be used?

YES >> GO TO 2.

NO >> GO TO 3.

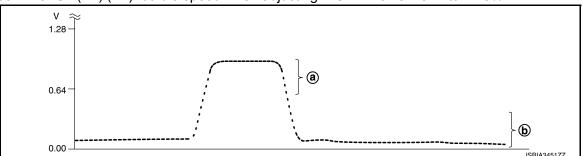
2.CHECK HEATED OXYGEN SENSOR 2

With CONSULT

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

2. Start engine and warm it up to the normal operating temperature.

- 3. Turn ignition switch OFF and wait at least 10 seconds.
- 4. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- 5. Let engine idle for 1 minute.
- Select "FUEL INJECTION" in "ACTIVE TEST" mode, and select "HO2S2 (B1)/(B2)" as the monitor item with CONSULT.
- 7. Check "HO2S2 (B1)/(B2)" at idle speed when adjusting "FUEL INJECTION" to \pm 25%.



"HO2S2 (B1)/(B2)" should be above (a) 0.72 V at least once when the "FUEL INJECTION" is + 25%. "HO2S2 (B1)/(B2)" should be below (b) 0.27 V at least once when the "FUEL INJECTION" is – 25%.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace malfunctioning heated oxygen sensor 2. Refer to EM-34. "Exploded View".

3.CHECK HEATED OXYGEN SENSOR 2-I

Without CONSULT

- T. Start engine and warm it up to the normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- 4. Let engine idle for 1 minute.
- 5. Check the voltage between ECM harness connector terminals under the following conditions.

	ECM			
Connector	+	-	Condition	Voltage
Connector	Terminal	Terminal		
F14	41 [HO2S2 (bank 1) signal]	35 (Sensor	Revving up to 4,000 rpm under no load at	The voltage should be above 0.72 V at least once during this procedure.
	32 [HO2S2 (bank 2) signal]	ground)	least 10 times	The voltage should be below 0.27 V at least once during this procedure.

Is the inspection result normal?

< DTC/CIRCUIT DIAGNOSIS > YES >> INSPECTION END

	voltage between	ECM har	ness connector terminals under the	following conditions.
	ECM			
Connector	+	-	Condition	Voltage
Connector	Terminal	Terminal		
F14	41 [HO2S2 (bank 1) signal]	35 (Sensor	Keeping engine at idle for 10 minutes	The voltage should be above 0.72 V at least once during this procedure.
	32 [HO2S2 (bank 2) signal]	ground)	·····	The voltage should be below 0.27 V at least once during this procedure.
YES >> NO >> O.CHECK	ection result norn > INSPECTION E > GO TO 5. HEATED OXYG	END SEN SENS		fe lless in en en d'Alexan
	voltage between	ECM nar	ness connector terminals under the	tollowing conditions.
	ECM			
Connector	+	_	Condition	Voltage
Connector	Terminal	Terminal		
	41 [HO2S2 (bank 1) signal]	35 (Sensor	Coasting from 80 km/h (50 MPH) with se-	The voltage should be above 0.72 V a least once during this procedure.
F14	32 (Sensor Jector lever i [HO2S2 (bank 2)			
F14		ground)	lector lever in the D position	The voltage should be below 0.27 V at least once during this procedure.
s the inspe	[HO2S2 (bank 2) signal] ection result norn	nal?	lector lever in the D position	
<u>s the inspe</u> YES >>	[HO2S2 (bank 2) signal] ection result norn	nal? END	heated oxygen sensor 2. Refer to E	least once during this procedure.
<u>s the inspe</u> YES >>	[HO2S2 (bank 2) signal] ection result norn	nal? END		least once during this procedure.
<u>s the inspe</u> YES >>	[HO2S2 (bank 2) signal] ection result norn	nal? END		least once during this procedure.
the inspension of the second sec	[HO2S2 (bank 2) signal] ection result norn	nal? END		least once during this procedure.
<u>s the inspe</u> YES >>	[HO2S2 (bank 2) signal] ection result norn	nal? END		least once during this procedure.
the inspenses YES >>	[HO2S2 (bank 2) signal] ection result norn	nal? END		least once during this procedure.
the inspenses	[HO2S2 (bank 2) signal] ection result norn	nal? END		least once during this procedure.
the inspe YES >>	[HO2S2 (bank 2) signal] ection result norn	nal? END		least once during this procedure.
<u>the inspe</u> YES >>	[HO2S2 (bank 2) signal] ection result norn	nal? END		least once during this procedure.
the inspenses	[HO2S2 (bank 2) signal] ection result norn	nal? END		least once during this procedure.

P0141, P0161 HEATED OXYGEN SENSOR 2 HEATER

< DTC/CIRCUIT DIAGNOSIS >

P0141, P0161 HEATED OXYGEN SENSOR 2 HEATER

DTC Logic

INFOID:000000012406422

[VQ35DE]

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P0141	HO2S2 HTR (B1) (O2 sensor heater circuit bank 1 sensor 2)	Sensor temperature does not increase for 100 consecutive seconds or more despite the maxi- mum operating condition of the heated oxygen	 Harness or connectors (The heated oxygen sensor 2 heater
P0161	HO2S2 HTR (B2) (O2 sensor heater circuit bank 2 sensor 2)	 sensor 2 heater. Sensor temperature does not decrease for 100 consecutive seconds or more despite the inactive condition of the heated oxygen sensor 2 heater. 	circuit is open or shorted.)Heated oxygen sensor 2 heater

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

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

TESTING CONDITION:

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

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine and warm it up to the normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Turn ignition switch ON.
- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 60 seconds under no load.
- 6. Let engine idle for 120 seconds.
- 7. Check 1st trip DTC.

Is 1st tip DTC detected?

YES >> Proceed to <u>EC-258, "Diagnosis Procedure"</u>. NO >> INSPECTION END

Diagnosis Procedure

1.CHECK H02S2 POWER SUPPLY

- 1. Disconnect heated oxygen sensor 2 (HO2S2) harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between HO2S2 harness connector and ground.

DTC		HO2S2		Ground	Voltage
DIC	Bank	Connector	Terminal	Ground	voltage
P0141	1	F86	1	Ground	Battery voltage
P0161	2	F85	1	Ground	Dattery voltage

Is the inspection result normal?

YES >> GO TO 3. NO >> GO TO 2. INFOID:000000012406423

P0141, P0161 HEATED OXYGEN SENSOR 2 HEATER

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

2.снеск н	O2S2 SEN		WER SU		0011									/
1. Turn ignit 2. Disconne	tion switch ect IPDM E e continuit	OFF. /R harness	connecto	or.		and	IPDM	E/R ha	arnes	conne	ector			E
		HO2S	>		IPDM	I F/R								
DTC	Bank	Connec		inal Co	nector		rminal	Conti	nuity					C
P0141	1	F86	1											
P0161	2	F85	1		F12		56	Exis	sted					
	Perform the Repair or re	trouble dia	r-detected	parts.				ND SH	IORT					E
2. Disconne	tion switch ect ECM ha e continuit	rness con		arness co	nnector	and	ECM	harnes	s con	nector.				F
DTC		HO2S2			ECM		Contir	nuity						0
DIC	Bank	Connector	Terminal	Connecto	r Term	inal	Contin	nunty						
P0141	1	F86	2	F14	7		Exis	ted						
P0161	2	F85	2		47	7								
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Is the inspection result normal?

Revision: October 2015

P0141, P0161 HEATED OXYGEN SENSOR 2 HEATER

< DTC/CIRCUIT DIAGNOSIS >

YES >> INSPECTION END

NO >> Replace malfunctioning heated oxygen sensor 2. Refer to EM-34, "Removal and Installation".

P014C, P014D, P014E, P014F, P015A, P015B, P015C, P015D A/F SENSOR 1 [VQ35DE] < DTC/CIRCUIT DIAGNOSIS >

P014C, P014D, P014E, P014F, P015A, P015B, P015C, P015D A/F SENSOR 1

DTC Logic

INFOID:000000012406425

DTC DETECTION LOGIC

To judge malfunctions, this diagnosis measures response time of the A/F signal computed by ECM from the A/ F sensor 1 signal. The time is compensated by engine operating (speed and load), fuel feedback control constant, and the A/F sensor 1 temperature index. Judgment is based on whether the compensated time (the A/F signal cycling time index) is inordinately long or not.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible Cause	
P014C	Air fuel ratio (A/F) sensor 1			
P014D	(bank 1) circuit slow re- sponse			E
P015A	Air fuel ratio (A/F) sensor 1			
P015B	(bank 1) circuit delayed re- sponse	• The response time of a A/F sensor 1 signal de- lays more than the specified time computed by	Harness or connectors (The A/F sensor 1 circuit is open or	F
P014E	Air fuel ratio (A/F) sensor 1	ECM.	shorted.) • A/F sensor 1	
P014F	(bank 2) circuit slow re- sponse			C
P015C	Air fuel ratio (A/F) sensor 1			
P015D	(bank 2) circuit delayed re- sponse			ŀ

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

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

2. Turn ignition switch ON.

3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 11 V at idle. Do vou have CONSULT?

YES	>> GO TO 2.
•	

NO >> GO TO 6.

2. PERFORM DTC CONFIRMATION PROCEDURE-1

With CONSULT

- 1. Start engine and warm it up to normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds. 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 minute. 6.
- Increase the engine speed up to about 3,600 rpm and keep it for 10 seconds. 7.
- Fully release accelerator pedal and then let engine idle for about 1 minute. 8.
- 9. Check the items status of "DATA MONITOR" as follows. NOTE:

If "PRSNT" changed to "ABSNT", refer to EC-230, "Component Function Check".

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P014C, P014D, P014E, P014F, P015A, P015B, P015C, P015D A/F SENSOR 1 < DTC/CIRCUIT DIAGNOSIS > [VQ35DE]

DTC	Data monitor item	Status
 P014C P014D P015A P015B 	A/F SEN1 DIAG3 (B1)	PRSNT
 P014E P014F P015C P015D 	A/F SEN1 DIAG3 (B2)	TRONT

Is "PRSNT" displayed on CONSULT screen?

YES >> GO TO 4.

NO >> GO TO 3.

3. PERFORM DTC CONFIRMATION PROCEDURE-2

With CONSULT

Perform DTC confirmation procedure-1 again.

Is "PRSNT" displayed on CONSULT screen?

YES >> GO TO 4.

NO >> Refer to EC-230, "Component Function Check".

4.PERFORM DTC CONFIRMATION PROCEDURE-2

With CONSULT

- 1. Wait for about 20 seconds at idle.
- 2. Check the items status of "DATA MONITOR" as follows.
- NOTE: If "CMPLT" changed to "INCMP", refer to EC-230, "Component Function Check".

DTC	Data monitor item	Status
• P014C	A/F SEN1 DIAG1 (B1)	
P014DP015AP015B	A/F SEN1 DIAG2 (B1)	CMPLT
• P014E	A/F SEN1 DIAG1 (B2)	GMPLI
P014FP015CP015D	A/F SEN1 DIAG2 (B2)	

Is "CMPLT" displayed on CONSULT screen?

YES >> GO TO 5.

NO >> Refer to EC-230, "Component Function Check".

5.PERFORM SELF-DIAGNOSIS

(B) With CONSULT

Check the "SELF-DIAG RESULT".

Is any DTC detected?

YES >> Proceed to EC-263, "Diagnosis Procedure".

NO >> INSPECTION END

6.CHECK AIR-FUEL RATIO SELF-LEARNING VALUE

With GST

- T. Start engine and warm it up to normal operating temperature.
- 2. Select Service \$01 with GST.
- 3. Calculate the total value of "Short term fuel trim" and "Long term fuel trim" indications.

Is the total percentage within ±15%?

YES >> GO TO 8. NO >> GO TO 7. < DTC/CIRCUIT DIAGNOSIS >

7. DETECT MALFUNCTIONING PART А Check the following. Intake air leaks · Exhaust gas leaks EC Incorrect fuel pressure Lack of fuel Fuel injector Incorrect PCV hose connection PCV valve Mass air flow sensor D >> Repair or replace malfunctioning part. 8.PERFORM DTC CONFIRMATION PROCEDURE Ε 1. Turn ignition switch OFF and wait at least 10 seconds. 2. Turn ignition switch ON. 3. Turn ignition switch OFF and wait at least 10 seconds. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load. F 4. 5. Let engine idle for 1 minute. Increase the engine speed up to about 3,600 rpm and keep it for 10 seconds. 6. 7. Fully release accelerator pedal and then let engine idle for about 1 minute. Check 1st trip DTC. 8. Is 1st trip DTC detected? >> Proceed to EC-263, "Diagnosis Procedure". YES Н NO >> INSPECTION END Diagnosis Procedure INFOID:000000012406426 **1.**RETIGHTEN A/F SENSOR 1 Loosen and retighten the A/F sensor 1. Refer to EM-34, "Exploded View". >> GO TO 2. 2.CHECK EXHAUST GAS LEAK Κ 1. Start engine and run it at idle. Listen for an exhaust gas leak before three way catalyst 1. 2. Three way catalyst 1 Three way catalyst 2 Muffler M A/F sensor 1 HO2S2 Ν To exhaust manifold : Exhaust gas PBIB1922E Is exhaust gas leak detected? YES >> Repair or replace. NO >> GO TO 3. 3.CHECK FOR INTAKE AIR LEAK Ρ Listen for an intake air leak after the mass air flow sensor. Is intake air leak detected? YES >> Repair or replace. NO >> GO TO 4. **4.**CLEAR THE MIXTURE RATIO SELF-LEARNING VALUE

P014C, P014D, P014E, P014F, P015A, P015B, P015C, P015D A/F SENSOR 1

< DTC/CIRCUIT DIAGNOSIS >

1. Clear the mixture ratio self-learning value. Refer to <u>EC-151, "Description"</u>.

2. Run engine for at least 10 minutes at idle speed.

Is the 1st trip DTC P0171, P0172, P0174 or P0175 detected? Is it difficult to start engine?

YES >> Perform trouble diagnosis for DTC P0171, P0174 or P0172, P0175. Refer to <u>EC-267, "DTC Logic"</u> or <u>EC-271, "DTC Logic"</u>.

NO >> GO TO 5.

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

1. Disconnect A/F sensor 1 harness connector.

2. Turn ignition switch ON.

3. Check the voltage between A/F sensor 1 harness connector and ground.

DTC		A/F sensor	1	Ground	Voltage
DIC	Bank	Connector	Terminal	Giouna	voltage
 P014C P014D P015A P015B 	1	F28	1	Ground	Battery voltage
 P014E P014F P015C P015D 	2	F65	1	Ground	Dattery voltage

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 6.

 ${f 6}.$ CHECK AIR FUEL RATIO (A/F) SENSOR 1 POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.

2. Disconnect IPDM E/R harness connector.

3. Check the continuity between A/F sensor 1 harness connector and IPDM E/R harness connector.

DTC		A/F sensor	1	IPDN	1 E/R	Continuity
DTC	Bank	Connector	Terminal	Connector	Terminal	Continuity
 P014C P014D P015A P015B 	1	F28	1	F12	57	Existed
 P014E P014F P015C P015D 	2	F65	1	ΓIΖ	57	Existed

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit.

NO >> Repair or replace error-detected parts.

7.check a/f sensor 1 input signal circuit for open and short

1. Turn ignition switch OFF.

2. Disconnect ECM harness connector.

3. Check the continuity between A/F sensor 1 harness connector and ECM harness connector.

[VQ35DE]

P014C, P014D, P014E, P014F, P015A, P015B, P015C, P015D A/F SENSOR 1 < DTC/CIRCUIT DIAGNOSIS > [VQ35DE]

DTC		A/F sensor	1	EC	CM	Continuity
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity
• P014C			3		66	
P014DP015AP015B	1	F28	4	F15	67	Existed
• P014E			3	115	76	LAISted
P014FP015CP015D	2	F65	4		77	

4. Check the continuity between A/F sensor 1 harness connector and ground, or ECM harness connector and ground.

DTC		A/F sensor	1	Ground	Continuity
DIC	Bank	Connector	Terminal	Giouna	Continuity
• P014C			3		
P014DP015AP015B	1	F28	4	Ground	Not existed
• P014E			3	Ground	NUL EXISIEU
P014FP015CP015D	2	F65	4		

DTC	ECM			Ground	Continuity
	Bank	Connector	Terminal	Giouna	Continuity
• P014C			66		
P014DP015AP015B	1	E15	67	Cround	Not existed
• P014E		F15 Ground Not existe	NUL EXISTED		
P014FP015CP015D	2		77		

5. Also check harness for short to power. L Is the inspection result normal? YES >> GO TO 8. NO >> Repair open circuit, short to ground or short to power in harness or connectors. Μ **8.**CHECK AIR FUEL RATIO (A/F) SENSOR 1 HEATER Check air fuel ratio (A/F) sensor 1 heater. Refer to EC-191, "Component Inspection". Ν Is the inspection result normal? YES >> GO TO 9. NO >> Replace malfunctioning air fuel ratio (A/F) sensor 1. Refer to EM-34, "Exploded View". Ο 9.CHECK MASS AIR FLOW SENSOR Check both mass air flow sensor (bank 1 and bank 2). Refer to EC-203, "Component Inspection". Ρ Is the inspection result normal? YES >> GO TO 10. NO >> Replace malfunctioning mass air flow sensor. Refer to EM-27, "Exploded View".

10.CHECK PCV VALVE

Check PCV valve. Refer to EC-512, "Work Procedure".

Is the inspection result normal?

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P014C, P014D, P014E, P014F, P015A, P015B, P015C, P015D A/F SENSOR 1

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

YES >> GO TO 11.

NO >> Repair or replace PCV valve. Refer to <u>EM-54</u>, "Exploded View".

11.CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace malfunctioning air fuel ratio (A/F) sensor 1. Refer to EM-34, "Exploded View".

NO >> Repair or replace error-detected parts.

< DTC/CIRCUIT DIAGNOSIS >

P0171, P0174 FUEL INJECTION SYSTEM FUNCTION

DTC Logic

INFOID:000000012406427

[VQ35DE]

DTC DETECTION LOGIC

With the Air/Fuel Mixture Ratio Self-Learning Control, the actual mixture ratio can be brought closely to the theoretical mixture ratio based on the mixture ratio feedback signal from A/F sensor 1. The ECM calculates the necessary compensation to correct the offset between the actual and the theoretical ratios. In case the amount of the compensation value is extremely large (the actual mixture ratio is too lean), the ECM judges the condition as the fuel injection system malfunction and illuminates the MIL (2 trip detection logic).

Sensor	Input signal to ECM	ECM function	Actuator	
A/F sensor 1	Density of oxygen in exhaust gas (Mixture ratio feedback signal)	Fuel injection control	Fuel injector	E

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	F
P0171	Fuel injection system too lean (bank 1)		 Intake air leakage A/F sensor 1 	I
P0174	Fuel injection system too lean (bank 2)	 Fuel injection system does not operate properly. The amount of mixture ratio compensation is too large. (The mixture ratio is too lean.) 	 Fuel injector Exhaust gas leakage Incorrect fuel pressure Lack of fuel 	G
			Mass air flow sensorIncorrect PCV hose connection	Н

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

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

2. Turn ignition switch ON.

3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE-I

- 1. Clear the mixture ratio self-learning value. Refer to <u>EC-151</u>, "Description".
- 2. Start engine.

Is it difficult to start engine?

YES	>> GO TO 3.

NO >> GO TO 4.

3.restart engine

If it is difficult to start engine, the fuel injection system has a malfunction, too. Crank engine while depressing accelerator pedal.

NOTE:

• When depressing accelerator pedal three-fourths (3/4) or more, the control system does not start the engine. Do not depress accelerator pedal too much.

Does engine start?

YES >> Proceed to EC-268, "Diagnosis Procedure".

NO >> Check exhaust and intake air leakage visually.

4.PERFORM DTC CONFIRMATION PROCEDURE-II

1. Keep engine idle for at least 5 minutes.

2. Check 1st trip DTC.

Is 1st trip DTC detected?

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Revision: October 2015

P0171, P0174 FUEL INJECTION SYSTEM FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

YES >> Proceed to EC-268, "Diagnosis Procedure".

NO >> GO TO 5.

5. PERFORM DTC CONFIRMATION PROCEDURE-III

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Start engine.
- 3. Maintain the following conditions for at least 10 consecutive minutes. Hold the accelerator pedal as steady as possible.
 - VHCL SPEED SE 50 120 km/h (31 75 mph)

CAUTION:

Always drive vehicle at a safe speed.

4. Check 1st trip DTC.

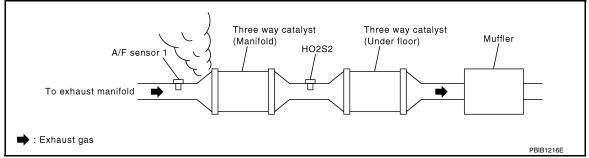
Is 1st trip DTC detected?

YES >> Proceed to <u>EC-268, "Diagnosis Procedure"</u>. NO >> INSPECTION END

Diagnosis Procedure

1. CHECK EXHAUST GAS LEAKAGE

- 1. Start engine and run it at idle.
- 2. Listen for an exhaust gas leakage before three way catalyst (manifold).



Is exhaust gas leakage detected?

YES >> Repair or replace malfunctioning part.

NO >> GO TO 2.

2. CHECK FOR INTAKE AIR LEAKAGE

- 1. Listen for an intake air leakage after the mass air flow sensor.
- 2. Check PCV hose connection.

Is intake air leakage detected?

YES >> Repair or replace malfunctioning part.

NO >> GO TO 3.

 ${\it 3.}$ CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT

1. Turn ignition switch OFF.

- 2. Disconnect corresponding A/F sensor 1 harness connector.
- 3. Disconnect ECM harness connector.
- 4. Check the continuity between A/F sensor 1 harness connector and ECM harness connector.

DTC	A/F sensor 1		ECM		Continuity	
ыс	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0171	1	F28	3		66	
FUITI	I	F20	4	F15	67	Existed
P0174	2	F65	3	F I J	76	Existed
FU1/4	2	105	4		77	1



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< DTC/CIRCUIT DIAGNOSIS >

5. Check the continuity between A/F sensor 1 harness connector and ground, or ECM harness connector and ground.

DTC -	A/F sensor 1			Ground	Continuity
	Bank	Connector	Terminal	Ground	Continuity
P0171	1	F28	3		
FUITI	1/1 F20 4	Ground	Not existed		
P0174	2	F65	3	Ground	NUL EXISLEU
FV1/4	2	105	4		

DTC	E	CM	Ground	Continuity	
DIC	Connector	Terminal	Giouna		
P0171		66			
	F15	67	Ground	Not existed	
	FID	76	Giouna	NOT EXISTED	
P0174		77			

6. Also check harness for short to power.

Is the inspection result normal?

O 4.

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

4.CHECK FUEL PRESSURE

- 1. Release fuel pressure to zero. Refer to EC-153, "Work Procedure".
- Install fuel pressure gauge kit [SST: (J-44321)] and check fuel pressure. Refer to <u>EC-153</u>, "Work Procedure".

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

Is the inspection result normal?

	hopotton robalt norman.	
YES	>> GO TO 6.	
NO	>> GO TO 5.	K
5. DE	TECT MALFUNCTIONING PART	
Check	fuel hoses and fuel tubes for clogging.	L
<u>Is the i</u>	nspection result normal?	
YES	>> Replace "fuel filter and fuel pump assembly". Refer to <u>FL-6, "Exploded View"</u> .	

NO >> Repair or replace malfunctioning part.

6.CHECK MASS AIR FLOW SENSOR

Check MAF sensor. Refer to EC-203, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 7.

NO >> Check connectors for rusted terminals or loose connections in the mass air flow sensor circuit or ground. Refer to <u>EC-206, "Diagnosis Procedure"</u>.

7. CHECK FUNCTION OF FUEL INJECTOR

With CONSULT

- 1. Start engine.
- 2. Perform "POWER BALANCE" in "ACTIVE TEST" mode with CONSULT.
- 3. Check that each circuit produces a momentary engine speed drop.

With GST

1. Let engine idle.

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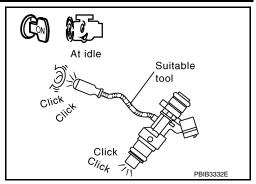
< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

- 2. Listen to each fuel injector operating sound.
- Is the inspection result normal?

YES >> GO TO 8.

NO >> Perform trouble diagnosis for FUEL INJECTOR, refer to <u>EC-479, "Diagnosis Procedure"</u>.



8. CHECK FUEL INJECTOR

- 1. Turn ignition switch OFF.
- 2. Confirm that the engine is cooled down and there are no fire hazards near the vehicle.
- 3. Disconnect all fuel injector harness connectors.
- 4. Remove fuel tube assembly. Refer to <u>EM-49</u>, "<u>Exploded View</u>". Keep fuel hose and all fuel injectors connected to fuel tube.
- 5. For DTC P0171, reconnect fuel injector harness connectors on bank 1. For DTC P0174, reconnect fuel injector harness connectors on bank 2.
- 6. Disconnect all ignition coil harness connectors.
- 7. Prepare pans or saucers under each fuel injector.
- Crank engine for about 3 seconds.
 For DTC P0171, check that fuel sprays out from fuel injectors on bank 1.
 For DTC P0174, check that fuel sprays out from fuel injectors on bank 2.

Fuel should be sprayed evenly for each fuel injector.

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u>.
- NO >> Replace fuel injectors from which fuel does not spray out. Always replace O-ring with new ones. Refer to <u>EM-49</u>, "<u>Exploded View</u>".

< DTC/CIRCUIT DIAGNOSIS >

P0172, P0175 FUEL INJECTION SYSTEM FUNCTION

DTC Logic

INFOID:000000012406429

DTC DETECTION LOGIC

With the Air/Fuel Mixture Ratio Self-Learning Control, the actual mixture ratio can be brought closely to the theoretical mixture ratio based on the mixture ratio feedback signal from A/F sensor 1. The ECM calculates the necessary compensation to correct the offset between the actual and the theoretical ratios. In case the amount of the compensation value is extremely large (the actual mixture ratio is too rich), the ECM judges the condition as the fuel injection system malfunction and illuminates the MIL (2 trip detection logic).

Sensor Input signal to ECM		ECM function	Actuator	D
A/F sensor 1	Density of oxygen in exhaust gas (Mixture ratio feedback signal)	Fuel injection control	Fuel injector	_

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0172	Fuel injection system too rich (bank 1)	 Fuel injection system does not operate properly. The amount of mixture ratio compensation is too 	 A/F sensor 1 Fuel injector Exhaust gas leakage
P0175	Fuel injection system too rich (bank 2)	large. (The mixture ratio is too rich.)	Incorrect fuel pressureMass air flow sensor
DTC CO	NFIRMATION PROC	EDURE	
1.PREC	ONDITIONING		
If DTC Co	onfirmation Procedure h	as been previously conducted, always perf	orm the following before conduct-
ing the ne			Ū.
	ignition switch OFF and ignition switch ON.	l wait at least 10 seconds.	
		l wait at least 10 seconds.	
~	>> GO TO 2.		
Z .PERF	ORM DTC CONFIRMA	TION PROCEDURE-I	
		earning value. Refer to <u>EC-151, "Description</u>	<u>1"</u> .
	engine. <u>Ilt to start engine?</u>		
	>> GO TO 3.		
	>> GO TO 4.		
3.REST/	ART ENGINE		
If it is diffi	cult to start engine, the	fuel injection system has a malfunction, too).
	gine while depressing a	ccelerator pedal.	
NOTE: • When c	lepressing accelerato	r pedal three-fourths (3/4) or more, the co	ontrol system does not start the
		lerator pedal too much.	······································
Does eng			
		"Diagnosis Procedure". ntake air leakage visually.	
4	ORM DTC CONFIRMA	0,	
	engine idle for at least k 1st trip DTC.	o minutes.	
	DTC detected?		
		"Diagnosis Procedure".	
NO >	>> GO TO 5.		

NO >> GO TO 5.

5.PERFORM DTC CONFIRMATION PROCEDURE-III

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< DTC/CIRCUIT DIAGNOSIS >

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Start engine.
- 3. Maintain the following conditions for at least 10 consecutive minutes. Hold the accelerator pedal as steady as possible.

 VHCL SPEED SE
 50 - 120 km/h (31 - 75 mph)

 CAUTION:
 Always drive vehicle at a safe speed.

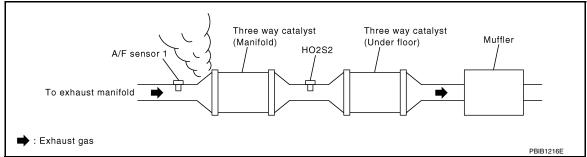
 4. Check 1st trip DTC.
 Is 1st trip DTC detected?

YES >> Proceed to <u>EC-272</u>, "Diagnosis Procedure". NO >> INSPECTION END

Diagnosis Procedure

1.CHECK EXHAUST GAS LEAKAGE

- 1. Start engine and run it at idle.
- 2. Listen for an exhaust gas leakage before three way catalyst (manifold).



Is exhaust gas leakage detected?

YES >> Repair or replace malfunctioning part.

NO >> GO TO 2.

2. CHECK FOR INTAKE AIR LEAKAGE

Listen for an intake air leakage after the mass air flow sensor.

Is intake air leakage detected?

YES >> Repair or replace malfunctioning part.

NO >> GO TO 3.

3.CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT

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

	1					
DTC	A/F sensor 1		E	Continuity		
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0172	1	F28	3		66	
FUITZ	I	F20	4	F15	67	Existed
P0175	2	F65	3	FIJ	76	Existed
F0175	2	F03	4		77	

5. Check the continuity between A/F sensor 1 harness connector and ground, or ECM harness connector and ground.

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< DTC/CIRCUIT DIAGNOSIS >

DTC

A/F sensor 1			Ground	Continuity	
Bank	Connector	Terminal	Ground	Continuity	
1 F28	E28	3			
	F20	1			

P0172	1	F28	Ŭ		
10172	I	120	4	Ground	Not existed
P0175	2	F65	3	Cround	Not Chisted
FUITS	2	105	4		

DTC	E	СМ	Ground	Continuity
DIC	Connector	Terminal	Ground	
P0172	F15	66	Ground	Not existed
		67		
P0175	FIJ	76		
P0175		77		

6. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 4.

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

4.CHECK FUEL PRESSURE

1.	Release fuel pressure to zero.	Refer to EC-153	. "Work Procedure".	

 Install fuel pressure gauge kit [SST: — (J-44321)] and check fuel pressure. Refer to <u>EC-153</u>, "Work Procedure".

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

Is the inspection result normal?

YES	>> GO TO 5.
NO	>> Replace "fuel filter and fuel pump assembly". Refer to <u>EM-49, "Exploded View"</u> .

5.CHECK MASS AIR FLOW SENSOR

Check MAF sensor. Refer to EC-203, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 6.
 NO >> Check connectors for rusted terminals or loose connections in the mass air flow sensor circuit or ground. Refer to <u>EC-206, "Diagnosis Procedure"</u>.

6.CHECK FUNCTION OF FUEL INJECTOR

With CONSULT

- 1. Start engine.
- 2. Perform "POWER BALANCE" in "ACTIVE TEST" mode with CONSULT.
- 3. Check that each circuit produces a momentary engine speed drop.

With GST

1. Let engine idle.

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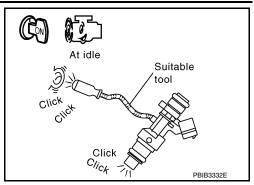
Listen to each fuel injector operating sound.

Is the inspection result normal?

YES >> GO TO 7.

2.

NO >> Perform trouble diagnosis for FUEL INJECTOR, refer to EC-479, "Diagnosis Procedure".



7. CHECK FUEL INJECTOR

- 1. Remove fuel injector assembly. Refer to <u>EM-49</u>, "<u>Exploded View</u>". Keep fuel hose and all fuel injectors connected to fuel tube.
- 2. Confirm that the engine is cooled down and there are no fire hazards near the vehicle.
- Disconnect all fuel injector harness connectors.
- 4. Disconnect all ignition coil harness connectors.
- 5. Prepare pans or saucers under each fuel injectors.
- 6. Crank engine for about 3 seconds. Check fuel does not drip from fuel injector.

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
- NO >> Replace the fuel injectors from which fuel is dripping. Always replace O-ring with new one. Refer to EM-49, "Exploded View".

< DTC/CIRCUIT DIAGNOSIS >

P0181 FTT SENSOR

DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis (Trouble diagnosis content)		DTC detecting condition	Possible cause
		A)	Rationally incorrect voltage from the sensor is sent to ECM, compared with the voltage signals from ECT sensor and intake air temperature sensor.	 Harness or connectors (The FTT sensor circuit is open or shorted) FTT sensor
P0181	FTT SENSOR [Fuel tank temperature (FTT) sensor circuit range/perfor- mance]	B)	The comparison result of signals trans- mitted to ECM from each temperature sensor (IAT sensor, ECT sensor, EOT sensor, and FTT sensor) shows that the voltage signal of the FTT sensor is higher/lower than that of other temper- ature sensors when the engine is start- ed with its cold state.	 Harness or connectors (High or low resistance in the FTT sensor circuit) FTT sensor
DTC CO	NFIRMATION PROCEDU	JRE		
1.INSPE	CTION START			
YES >	<u>ssary to erase permanent D</u> >> GO TO 7. >> GO TO 2. ONDITIONING	<u>1C?</u>		
dure befo 1. Turn 2. Turn 3. Turn	ONFIRMATION PROCEDU re conducting the next test. ignition switch OFF and wa ignition switch ON. ignition switch OFF and wa	t at le		ways perform the following proce
3.PERF	ORM DTC CONFIRMATION		OCEDURE FOR MALFUNCTION	A-I
2. Chec Is 1st trip YES	ignition switch ON and wait k 1st trip DTC. <u>DTC detected?</u> >> Proceed to <u>EC-277, "Dia</u> >> GO TO 4.			
4.CHEC	K ENGINE COOLANT TEN	IPER	ATURE	
2. Chec	xt "COOLAN TEMP/S" in "D k "COOLAN TEMP/S" value		MONITOR" with CONSULT.	
<u>"COOLAN</u> YES >	e procedure "With CONSUL <u>\ TEMP/S" less than 60°C (</u> >> INSPECTION END			
-	>> GO TO 5. ORM DTC CONFIRMATION		OCEDURE FOR MALFUNCTION	A-II
(P)With C				/
		N TE	MP/S" is less than 60°C (140°F).	

1. Cool engine down until "COOLAN TEMP/S" is less than 60°C (140°F).

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< DTC/CIRCUIT DIAGNOSIS >

2. Wait at least 10 seconds.

3. Check 1st trip DTC.

With GST

Follow the procedure "With CONSULT" above.

Is 1st trip DTC detected?

YES >> Proceed to EC-277, "Diagnosis Procedure".

NO >> GO TO 6.

Ó.PERFORM COMPONENT FUNCTION CHECK (FOR MALFUNCTION B)

Perform component function check. Refer to <u>EC-276, "Component Function Check"</u>. **NOTE:**

Use the component function check to check the overall function of the FTT sensor circuit. During this check, a 1st trip DTC might not be confirmed.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to <u>EC-277, "Diagnosis Procedure"</u>.

7.PRECONDITIONING

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

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

2. Turn ignition switch ON.

3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

- Before performing the following procedure, do not add fuel.
- Before performing the following procedure, check that fuel level is between 1/4 and 4/4.
- Before performing the following procedure, confirm that battery voltage is 11 V or more at idle.

>> GO TO 8.

8. PERFORM DTC CONFIRMATION PROCEDURE B

- 1. Start engine and let it idle for 60 minutes.
- 2. Move the vehicle to a cool place.
 - NOTE:

Cool the vehicle in an environment of ambient air temperature between –10°C (14°F) and 35°C (95°F).

3. Turn ignition switch OFF and leave the vehicle for 12 hours.

CAUTION: Never turn ignition switch ON during this procedure. NOTE:

- The vehicle must be cooled with the hood open.4. Start engine and let it idle for 5 minutes or more.
 - CAUTION:

Never turn ignition switch OFF during idling.

5. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to EC-277, "Diagnosis Procedure".
- NO >> INSPECTION END

Component Function Check

1.CHECK FUEL TANK TEMPERATURE (FTT) SENSOR

- 1. Turn ignition switch OFF.
- 2. Disconnect fuel level sensor unit and fuel pump harness connector.
- 3. Remove fuel level sensor unit. Refer to <u>FL-6</u>, "Exploded View".

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< DTC/CIRCUIT DIAGNOSIS >

4. Check resistance between fuel level sensor unit and fuel pump terminals by heating with hot water as shown in the figure.

Terminals	Condition	Resistance (k Ω)	
4 and 5	Temperature [°C (°F)]	20 (68)	2.3 – 2.7
4 and 5		50 (122)	0.79 – 0.90

Is the inspection result normal?

YES >> GO TO 2.

NO >> Proceed to EC-277, "Diagnosis Procedure".

2. CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to GI-41, "Intermittent Incident".
Is the inspection result normal?
YES >> INSPECTION END
NO >> Proceed to <u>EC-277, "Diagnosis Procedure"</u> .
Diagnosis Procedure
1.INSPECTION START
Confirm the detected malfunction (A or B). Refer to EC-275, "DTC Logic".
Which malfunction is detected?
A >> GO TO 2.
B >> GO TO 5.
2. CHECK FUEL TANK TEMPERATURE SENSOR POWER SUPPLY
1. Turn ignition switch OFF.
2. Disconnect fuel level sensor unit and fuel pump harness connector.
3. Turn ignition switch ON.
4. Check the voltage between fuel level sensor unit and fuel pump harness connector and ground.
Fuel level sensor unit and fuel pump

Fuel level sensor	unit and fuel pump	Ground	Voltage	
Connector	Terminal	Ground	voltage	
B40	4	Ground	Approx. 5 V	

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

${f 3.}$ CHECK FUEL TANK TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check the continuity between fuel tank temperature sensor harness connector and ECM harness connector tor.

Fuel level sensor unit and fuel pump		E	Continuity	
Connector	Terminal	Connector	Terminal	
B40	4	E19	128	Existed

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit.

4.CHECK FUEL TANK TEMPERATURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.

2. Disconnect ECM harness connector.

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NO >> Repair or replace error-detected parts.

< DTC/CIRCUIT DIAGNOSIS >

3. Check the continuity between fuel level sensor unit and fuel pump harness connector and ECM harness connector.

Fuel level sensor	unit and fuel pump	E	Continuity	
Connector	Terminal	Connector	Terminal	Continuity
B40	5	E19	148	Existed

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

Is the inspection result normal?

YES >> GO TO 5.

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

5. CHECK FUEL TANK TEMPERATURE SENSOR

Check fuel tank temperature sensor. Refer to EC-278, "Component Inspection".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".

NO >> Replace fuel level sensor unit and fuel pump. Refer to FL-6, "Exploded View".

Component Inspection

1.CHECK FUEL TANK TEMPERATURE SENSOR

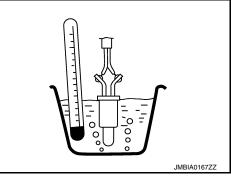
- 1. Turn ignition switch OFF.
- Remove fuel level sensor unit. Refer to FL-6, "Exploded View". 2.
- Check resistance between "fuel level sensor unit and fuel pump" 3. terminals by heating with hot water as shown in the figure.

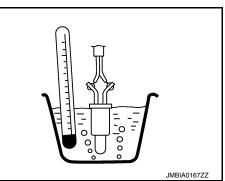
Terminals	Condition		Resistance
4 and 5	Tomporaturo [°C (°E)]	20 (68)	2.3 - 2.7 kΩ
4 810 5	4 and 5 Temperature [°C (°F)		0.79 - 0.90 kΩ

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace fuel level sensor unit and fuel pump. Refer to FL-6, "Exploded View".





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P0182, P0183 FTT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P0182, P0183 FTT SENSOR

DTC Logic

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DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC d	etecting condition	Possible cause
P0182	Fuel tank temperature sensor circuit low input	An excessively low sent to ECM.	v voltage from the sensor is	Harness or connectors (The sensor circuit is open or shorted.)
P0183	Fuel tends temperature An exceeded with high valtage from the concerts		Fuel tank temperature sensor	
DTC CON	FIRMATION PROCE	EDURE		
1.PRECO	NDITIONING			
ing the nex 1. Turn ig 2. Turn ig		wait at least 10	seconds.	perform the following before conduct-
>>	GO TO 2.			
2.PERFO	RM DTC CONFIRMAT	ION PROCEDU	IRE	
	nition switch ON and v	vait at least 5 se	econds.	
	1st trip DTC. TC detected?			
	 Proceed to <u>EC-279, '</u> 	Diagnosis Proc	edure".	
NO >>	INSPECTION END			
Diagnosi	s Procedure			INFOID:000000012406436
1.снеск	GROUND CONNECT	ION		
	nition switch OFF.			
	-	8. Refer to Grou	Ind Inspection in <u>GI-44.</u>	"Circuit Inspection".
	ction result normal? • GO TO 2.			
NO >>	Repair or replace gro			
		RATURE SENSO	OR POWER SUPPLY C	RCUIT
	nition switch OFF.	unit and fuel or	Imp" harness connector.	
3. Turn ig	nition switch ON.	-	-	
4. Check	the voltage between "	tuel level sensor	unit and fuel pump" hai	rness connector and ground.
Fuel level s	ensor unit and fuel pump			
Connect	or Terminal	Ground	Voltage	
B40	4	Ground	Approx. 5 V	
Is the inspe	ection result normal?			
	GO TO 4.			

3. DETECT MALFUNCTIONING PART

Check the following.

· Harness connectors E104, B4

· Harness for open or short between ECM and "fuel level sensor unit and fuel pump"

EC-279

P0182, P0183 FTT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

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

4.CHECK FUEL TANK TEMPERATURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.

2. Disconnect ECM harness connector.

3. Check the continuity between "fuel level sensor unit and fuel pump" harness connector and ECM harness connector.

Fuel level sensor	ensor unit and fuel pump ECM Continuit		ECM		
Connector	Terminal	Connector Terminal		Continuity	
B40	5	E19	148	Existed	

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

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

Harness connectors E105, M11

Harness connectors M77, B11

• Harness for open or short between "fuel level sensor unit and fuel pump" and ECM

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

6.CHECK FUEL TANK TEMPERATURE SENSOR

Refer to EC-280, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace "fuel level sensor unit and fuel pump".

7.CHECK INTERMITTENT INCIDENT

Refer to GI-41. "Intermittent Incident".

>> INSPECTION END

Component Inspection

1.CHECK FUEL TANK TEMPERATURE SENSOR

1. Turn ignition switch OFF.

2. Remove fuel level sensor unit. Refer to FL-6, "Exploded View".

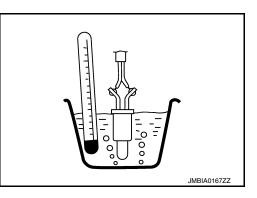
 Check resistance between "fuel level sensor unit and fuel pump" terminals by heating with hot water as shown in the figure.

Terminals	Condition	Resistance	
4 and 5	Temperature [°C (°F)]	20 (68)	2.3 - 2.7 kΩ
		50 (122)	0.79 - 0.90 kΩ

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace fuel level sensor unit and fuel pump. Refer to <u>FL-6. "Exploded View"</u>.



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< DTC/CIRCUIT DIAGNOSIS >

P0196 EOT SENSOR

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P0196 is displayed with DTC P0197 or P0198, first perform the trouble diagnosis for DTC P0197 or P0198. Refer to <u>EC-285, "DTC Logic"</u>.

DTC No.	Trouble diagnosis (Trouble diagnosis content)		DTC detecting condition	Possible cause
		A)	Rationally incorrect voltage from the sensor is sent to ECM, compared with the voltage signals from EOT sensor and intake air temperature sensor.	 Harness or connectors (The EOT sensor circuit is open or shorted) EOT sensor
P0196	EOT SENSOR [Engine oil temperature (EOT) sensor circuit range/perfor- mance]		The comparison result of signals trans- mitted to ECM from each temperature sensor (IAT sensor, ECT sensor, FTT sensor, and EOT sensor) shows that the signal voltage of the EOT sensor is high- er/lower than that of other temperature sensors when the engine is started with its cold state.	 Harness or connectors (High or low resistance in the EOT sensor circuit) EOT sensor
	NFIRMATION PROCED	JRE		
1.INSPE	ECTION START			
2.PREC If DTC C dure befc 1. Turn 2. Turn	ore conducting the next test ignition switch OFF and wa ignition switch ON.	it at l		ways perform the following proce-
3. Turn	ignition switch OFF and wa CONDITION:	it at I	east 10 seconds.	
		roce	dure, confirm that battery voltag	e is 11 V or more at idle.
	>> GO TO 3.			
3.perf	ORM DTC CONFIRMATIO	N PR	OCEDURE FOR MULFUNCTION	A-I
2. Turn 3. Turn 4. Turn	engine and warm it up to n ignition switch OFF and wa ignition switch ON. ignition switch OFF and wa engine and let it idle for 5 r	iit at l iit at l	east 10 seconds. east 10 seconds.	
6. Cheo	ck 1st trip DTC.			
YES	<u>DTC detected?</u> >> Proceed to <u>EC-283, "Dia</u> >> GO TO 4.	agnos	sis Procedure".	
		N PR	OCEDURE FOR MULFUNCTION	A-11
With C	ONSULT			_
	ct "DATA MONITOR" mode that "COOLAN TEMP/S"			
If it is	s above 70°C (158°F), go to	the f	ollowing steps.	

EC-281

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< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

If it is below 70°C (158°F), warm engine up until "COOLAN TEMP/S" indicates more than 70°C (158°F). Then perform the following steps.

- 3. Turn ignition switch OFF and soak the vehicle in a cool place.
- 4. Turn ignition switch ON. NOTE: Do not turn ignition switch OFE until s

Do not turn ignition switch OFF until step 8. 5. Select "DATA MONITOR" mode with CONSULT.

6. Check the following.

COOLAN TEMP/S	Below 40°C (104°F)
INT/A TEMP SE	Below 40°C (104°F)
Difference between "COOLAN TEMP/S" and "INT/A TEMP SE"	Within 6°C (11°F)

If they are within the specified range, perform the following steps.

If they are out of the specified range, soak the vehicle to meet the above conditions. Then perform the following steps.

NOTE:

• Do not turn ignition switch OFF.

- If it is supposed to need a long period of time, do not deplete the battery.
- 7. Start engine and let it idle for 5 minutes.
- 8. Check 1st trip DTC.
- With GST

Follow the procedure "With CONSULT" above.

Is 1st trip DTC detected?

YES >> Proceed to EC-283, "Diagnosis Procedure".

NO >> GO TO 5.

5.PERFORM COMPONENT FUNCTION CHECK (FOR MULFUNCTION B)

Perform component function check. Refer to EC-283. "Component Function Check".

NOTE:

Use the component function check to check the overall function of the EOT sensor circuit. During this check, a 1st trip DTC might not be confirmed.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to EC-283, "Diagnosis Procedure".

6.PRECONDITIONING

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

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

2. Turn ignition switch ON.

3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

- Before performing the following procedure, do not add fuel.
- Before performing the following procedure, check that fuel level is between 1/4 and 4/4.
- Before performing the following procedure, confirm that battery voltage is 11 V or more at idle.

>> GO TO 7.

/.PERFORM DTC CONFIRMATION PROCEDURE B

- 1. Move the vehicle to a cool place.
- NOTE:

Cool the vehicle in an environment of ambient air temperature between $-10^{\circ}C$ (14°F) and 35°C (95°F). 2. Turn ignition switch OFF and leave the vehicle for 12 hours.

CAUTION: Never turn ignition switch ON during this procedure. NOTE:

The vehicle must be cooled with the hood open.

3. Start engine and let it idle for 5 minutes or more.

< DTC/CIRCUIT DIAGNOSIS >

CAUTION:

Never turn ignition switch OFF during idling.

4. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to <u>EC-283</u>, "Diagnosis Procedure".

NO >> INSPECTION END

Component Function Check

1.CHECK ENGINE OIL TEMPERATURE (EOT) SENSOR

1. Turn ignition switch OFF.

- 2. Disconnect EOT sensor harness connector.
- 3. Remove EOT sensor. Refer to CO-27, "Exploded View".
- Check resistance between EOT sensor terminals by heating with hot water as shown in the figure.

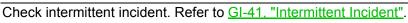
Terminals	Condition	Resistance (k Ω)		
1 and 2		20 (68)	2.1 – 2.9	
	Temperature [°C (°F)]	50 (122)	0.68 – 1.00	
		90 (194)	0.236 – 0.260	

Is the inspection result normal?

YES >> GO TO 2.

NO >> Proceed to <u>EC-283, "Diagnosis Procedure"</u>.

2. CHECK INTERMITTENT INCIDENT



Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to EC-283, "Diagnosis Procedure".

Diagnosis Procedure

1. CHECK ENGINE OIL TEMPERATURE SENSOR

Check engine oil temperature sensor. Refer to EC-283, "Component Inspection".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".

NO >> Replace engine oil temperature sensor. Refer to <u>EM-68, "Exploded View"</u>.

Component Inspection

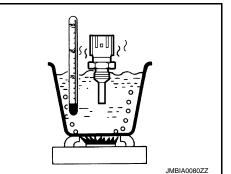
1. CHECK ENGINE OIL TEMPERATURE SENSOR

- 1. Turn ignition switch OFF.
- 2. Disconnect engine oil temperature sensor harness connector.
- 3. Remove engine oil temperature sensor. Refer to EM-68. "Exploded View".
- Check resistance between engine oil temperature sensor terminals by heating with hot water as shown in the figure.

Terminals	Condition	Resistance	
1 and 2		20 (68)	2.1 - 2.9 kΩ
	Temperature [°C (°F)]	50 (122)	0.68 - 1.00 kΩ
		90 (194)	0.236 - 0.260 kΩ

Is the inspection result normal?

YES >> INSPECTION END



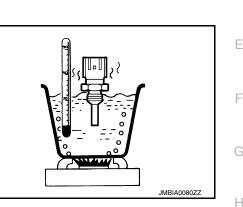
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NO >> Replace engine oil temperature sensor. Refer to EM-68, "Exploded View".

P0197, P0198 EOT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P0197, P0198 EOT SENSOR

DTC Logic

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DTC DETECTION LOGIC

DTC No.	Trouble Diag Name	-	DTC det	ecting condition	Possible Cause		
P0197	Engine oil ten ture sensor cir input		An excessively low sent to ECM.	voltage from the sensor is	 Harness or connectors (The sensor circuit is open or shorted.) 		
P0198	Engine oil ten ture sensor ci high input	-	An excessively high sent to ECM.	ccessively high voltage from the sensor is • Engine oil temperature sensor			
	NFIRMATIO	N PRC	CEDURE				
1 .PRECO	ONDITIONIN	G					
ing the ne 1. Turn i 2. Turn i	xt test. gnition switc gnition switc	h OFF a h ON.	e has been previ and wait at least ? and wait at least ?	10 seconds.	ays perform the following before conduct-		
>	> GO TO 2.						
2.PERFC	ORM DTC CO	ONFIRM	IATION PROCE	DURE			
	engine and w (1st trip DT(ast 5 seconds.				
•	DTC detecte						
	> Proceed to > INSPECTI		<u>5, "Diagnosis Pro</u> D	<u>ocedure"</u> .			
	is Proced				INFOID:000000012406443		
			WER SUPPLY				
	nnect engine gnition switc		perature (EOT) s	ensor harness conne	ctor.		
			n EOT sensor ha	arness connector and	ground.		
EOT	sensor						
Connector		Ground	Voltage				
F66	1	Ground	Approx. 5 V				
Is the insp	ection result	normal	?				
	> GO TO 2.				h		
-			-	•	harness or connectors.		
	LEUI SENS	OK GR		FOR OPEN AND SH			
1. Turn i	gnition switc nnect ECM ł		connector.				

EOT s	EOT sensor		ECM	
Connector	Terminal	Connector Terminal		Continuity
F66	2	F14	15	Existed

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

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 3.

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

3.CHECK ENGINE OIL TEMPERATURE SENSOR

Check engine oil temperature sensor. Refer to EC-286, "Component Inspection".

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u>.
- NO >> Replace engine oil temperature sensor. Refer to EM-68. "Exploded View".

Component Inspection

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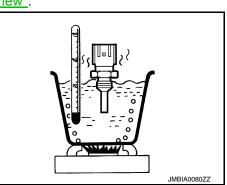
1. CHECK ENGINE OIL TEMPERATURE SENSOR

- 1. Turn ignition switch OFF.
- 2. Disconnect engine oil temperature sensor harness connector.
- 3. Remove engine oil temperature sensor. Refer to EM-68, "Exploded View".
- 4. Check resistance between engine oil temperature sensor terminals by heating with hot water as shown in the figure.

Terminals	Condition	Resistance	
		20 (68)	2.1 - 2.9 kΩ
1 and 2	Temperature [°C (°F)]	50 (122)	0.68 - 1.00 kΩ
		90 (194)	0.236 - 0.260 kΩ

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Replace engine oil temperature sensor. Refer to <u>EM-68.</u> <u>"Exploded View"</u>.



[VQ35DE]

P0222, P0223 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P0222, P0223 TP SENSOR

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P0222 or P0223 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. Refer to <u>EC-379, "DTC Logic"</u>.

DTC No.	Trouble diagnosis name	DTO	C detecting condition	Possible cause
P0222	Throttle position sensor 1 circuit low input	An excessively 1 is sent to ECI	low voltage from the TP sensor M.	Harness or connectors (TP sensor 1 circuit is open or shorted.)
P0223	Throttle position sensor 1 circuit high input	An excessively 1 is sent to ECI	high voltage from the TP sensor M.	Electric throttle control actuator (TP sensor 1)
DTC CON	FIRMATION PROC	EDURE		
1.PRECO	NDITIONING			
If DTC Cor	firmation Procedure h	as been previ	ously conducted, always p	erform the following before conduct-
ing the nex	t test. Inition switch OFF and	l wait at lagat	10 accordo	-
	inition switch OPP and	i wali al leasi	TO SECONDS.	
	nition switch OFF and CONDITION:	l wait at least	10 seconds.	
		g procedure,	confirm that battery volt	age is more than 10 V at idle.
	-		-	-
~	> GO TO 2.			
2. PERFO	RM DTC CONFIRMA	FION PROCE	DURE	
1. Start e 2. Check	ngine and let it idle for	1 second.		
z. Check Is DTC det				
	Proceed to <u>EC-287.</u>	"Diagnosis Pr	ocedure".	
NO >:	> INSPECTION END	-		
Diagnosi	s Procedure			INFOID:000000012406446
1 .снеск	THROTTLE POSITIC	N SENSOR 1	POWER SUPPLY	
	nect electric throttle c			
2. Turn ig	nition switch ON.			
Check	the voltage between e	electric throttle	control actuator harness of	connector and ground.
Electric th	nrottle control actuator			
Electric th Connect		Ground	Voltage	
		Ground	Voltage Approx. 5 V	
Connect F50	or Terminal			
Connect F50 Is the inspe YES >:	or Terminal 5 ection result normal? > GO TO 3.			
Connect F50 Is the inspective YES >> NO >>	or Terminal 5 ection result normal? > GO TO 3. > GO TO 2.	Ground		

2. Disconnect ECM harness connector.

3. Check the continuity between electric throttle control actuator and ECM harness connector.

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[VQ35DE]

P0222, P0223 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

Electric throttle	Electric throttle control actuator		ECM		
Connector	Terminal	Connector Terminal		Continuity	
F50	5	F15	98	Existed	

Is the inspection result normal?

YES >> Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u>.

NO >> Repair or replace error-detected parts.

${f 3.}$ CHECK THROTTLE POSITION SENSOR 1 GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.

3. Check the continuity between electric throttle control actuator and ECM harness connector.

Electric throttle	control actuator	EC	Continuity	
Connector	Terminal	Connector	Terminal	Continuity
F50	4	F15	75	Existed

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

Is the inspection result normal?

YES >> GO TO 4.

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

4. CHECK THROTTLE POSITION SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between electric throttle control actuator and ECM harness connector.

Electric throttle control actuator		ECM		Continuity
Connector	Terminal	Connector	Terminal	Continuity
F50	6	F15	71	Existed

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

Is the inspection result normal?

YES >> GO TO 5.

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

5.CHECK THROTTLE POSITION SENSOR

Check throttle position sensor. Refer to EC-288. "Component Inspection".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41. "Intermittent Incident".

NO >> Replace electric throttle control actuator. Refer to <u>EM-29</u>, "Exploded View".

Component Inspection

INFOID:000000012406447

1.CHECK THROTTLE POSITION SENSOR 1. Turn ignition switch OFF.

- Reconnect all harness connectors disconnected.
- 3. Perform EC-148, "Description".
- 4. Turn ignition switch ON.
- 5. Set selector lever to D position.
- 6. Check the voltage between ECM harness connector terminals under the following conditions.

P0222, P0223 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

ECM					
Onenation	+	_	Condition		Voltage
Connector	Terminal	Terminal			
	71	75	Accelerator pedal	Fully released	More than 0.36 V
F15	(TP sensor 1 sig- nal)			Fully depressed	Less than 4.75 V
FID	72	(Sensor ground)		Fully released	Less than 4.75 V
	(TP sensor 2 sig- nal)		-		More than 0.36 V

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace electric throttle control actuator. Refer to EM-29, "Exploded View".

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< DTC/CIRCUIT DIAGNOSIS >

P0300, P0301, P0302, P0303, P0304, P0305, P0306 MISFIRE

DTC Logic

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DTC DETECTION LOGIC

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.

1. One Trip Detection Logic (Three Way Catalyst Damage)

On the 1st trip, when a misfire condition occurs that can damage the three way catalyst (TWC) due to overheating, the MIL will blink.

When a misfire condition occurs, the ECM monitors the CKP sensor signal every 200 engine revolutions for a change.

When the misfire condition decreases to a level that will not damage the TWC, the MIL will turn off. If another misfire condition occurs that can damage the TWC on a second trip, the MIL will blink. When the misfire condition decreases to a level that will not damage the TWC, the MIL will remain on. If another misfire condition occurs that can damage the TWC, the MIL will begin to blink again.

 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 illuminate when the misfire is detected on a second trip. During this condition, the ECM monitors the CKP sensor signal every 1,000 engine revolutions.

A misfire malfunction can be detected in any one cylinder or in multiple cylinders.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0300	Multiple cylinder misfires detected	Multiple cylinders misfire.	Improper spark plug
P0301	No. 1 cylinder misfire detected	No. 1 cylinder misfires.	Insufficient compression Incorrect fuel pressure
P0302	No. 2 cylinder misfire detected	No. 2 cylinder misfires.	The fuel injector circuit is open or shorted
P0303	No. 3 cylinder misfire detected	No. 3 cylinder misfires.	 Fuel injector Intake air leakage
P0304	No. 4 cylinder misfire detected	No. 4 cylinder misfires.	The ignition signal circuit is open or shorted
P0305	No. 5 cylinder misfire detected	No. 5 cylinder misfires.	 Lack of fuel Signal plate A/F sensor 1 Incorrect PCV hose connection
P0306	No. 6 cylinder misfire detected	No. 6 cylinder misfires.	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

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

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE-I

- 1. Start engine and warm it up to normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Turn ignition switch ON.
- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Restart engine and let it idle for approximately 15 minutes.
- 6. Check 1st trip DTC.

Is 1st trip DTC detected?

P0300	, P0301, P0302, P0303, P0304, P0305, P0306 MISFIRE	
< DTC/CIRCUIT DIAC	GNOSIS > [VQ3	35DE]
YES >> Proceed to NO >> GO TO 3.	D <u>EC-291, "Diagnosis Procedure"</u> .	A
3. PERFORM DTC CO	ONFIRMATION PROCEDURE-II	
2. Turn ignition switcl	h OFF and wait at least 10 seconds. h ON. h OFF and wait at least 10 seconds.	EC
4. Start engine and o time. Refer to the the Hold the accelera	drive the vehicle under similar conditions to (1st trip) Freeze Frame Data for a c	С
the same time. CAUTION:	icle in safe manner according to traffic conditions and obey all traffic laws	D
ariving.		E
Engine speed	Engine speed in the freeze frame data ±400 rpm	
Vehicle speed	Vehicle speed in the freeze frame data \pm 10 km/h (6 MPH)	F
Basic fuel schedule	Basic fuel schedule in freeze frame data \times (1 \pm 0.1)	ſ"
	When the freeze frame data shows lower than 70° C (158°E)	

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

Driving time varies according to the engine speed in the freeze frame data.

Engine speed	Time	
Around 1,000 rpm	Approximately 10 minutes	
Around 2,000 rpm	Approximately 5 minutes	
More than 3,000 rpm	Approximately 3.5 minutes	

- 5. Check 1st trip DTC.
- Is 1st trip DTC detected?
- YES >> Proceed to EC-291, "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

1. CHECK GROUND CONNECTION

Check the following.

Connection condition of the ground F83 and F84.

Connection condition of the ground harness between engine assembly and vehicle body (If equipped).

Is the inspection result normal?

YES	>> GO TO 2.
NO	S.S. Denela en acal

NO >> Repair or replace error-detected parts.

2.CHECK FOR INTAKE AIR LEAKAGE AND PCV HOSE

- 1. Start engine and run it at idle speed.
- 2. Listen for the sound of the intake air leakage.
- 3. Check PCV hose connection.

Is intake air leakage detected?

YES >> Discover air leakage location and repair.

NO >> GO TO 3.

\mathbf{3}. CHECK FOR EXHAUST SYSTEM CLOGGING

Stop engine and visually check exhaust tube, three way catalyst and muffler for dents. Is the inspection result normal?

Revision: October 2015

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INFOID:000000012406449

< DTC/CIRCUIT DIAGNOSIS >

- YES-1 >> With CONSULT: GO TO 4.
- YES-2 >> Without CONSULT: GO TO 5.

4.PERFORM POWER BALANCE TEST

With CONSULT

- 1. Start engine.
- 2. Perform "POWER BALANCE" in "ACTIVE TEST" mode with CONSULT.
- 3. Check that each circuit produces a momentary engine speed drop.

Is the inspection result normal?

YES >> GO TO 10.

NO >> GO TO 5.

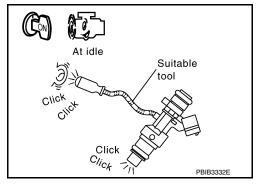
5.CHECK FUNCTION OF FUEL INJECTOR

- 1. Start engine and let it idle.
- 2. Listen to each fuel injector make operation sound.

Clicking sound should be heard.

Is the inspection result normal?

- YES >> GO TO 6.
- NO >> Perform trouble diagnosis for FUEL INJECTOR, refer to <u>EC-479, "Diagnosis Procedure"</u>.



6.CHECK FUNCTION OF IGNITION COIL-I

CAUTION:

Perform the following procedure in a place with no combustible objects and good ventilation.

- 1. Turn ignition switch OFF.
- 2. Remove fuel pump fuse in IPDM E/R to release fuel pressure.
- NOTE:

Do not use CONSULT to release fuel pressure, or fuel pressure applies again during the following procedure.

- 3. Start engine.
- 4. After engine stalls, crank it 2 or 3 times to release all fuel pressure.
- 5. Turn ignition switch OFF.
- 6. Remove all ignition coil harness connectors to avoid the electrical discharge from the ignition coils.
- 7. Remove ignition coil and spark plug of the cylinder to be checked.
- 8. Crank engine for 5 seconds or more to remove combustion gas in the cylinder.
- 9. Connect spark plug and harness connector to ignition coil.
- 10. Fix ignition coil using a rope etc. with gap of 13 17 mm (0.52 0.66 in) between the edge of the spark plug and grounded metal portion as shown in the figure.
- 11. Crank engine for approximately 3 seconds, and check whether spark is generated between the spark plug and the grounded metal portion.

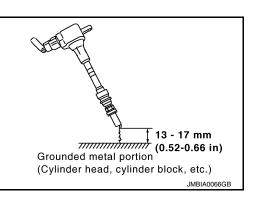
Spark should be generated.

CAUTION:

• During the operation, always stay 0.5 m (19.7 in) or more away from the spark plug and the ignition coil. Be careful not to get an electrical shock while checking, because the electrical discharge voltage becomes 20 kV or more.

• It might damage the ignition coil if the gap of more than 17 mm (0.66 in) is made. NOTE:

When the gap is less than 13 mm (0.52 in), a spark might be generated even if the coil is malfunctioning.



[VQ35DE]

P0300, P0301, P0302, P0303, P0304, P0305, P0306 MISFIRE < DTC/CIRCUIT DIAGNOSIS > [VQ35DE]
Is the inspection result normal?
YES >> GO TO 10. A NO >> GO TO 7.
7. CHECK FUNCTION OF IGNITION COIL-II
 Turn ignition switch OFF. Disconnect spark plug and connect a non-malfunctioning spark plug. Crank engine for approximately 3 seconds, and recheck whether spark is generated between the spark plug and the grounded metal portion.
Spark should be generated.
Is the inspection result normal?
YES >> GO TO 8. NO >> Check ignition coil, power transistor and their circuits. Refer to <u>EC-484, "Diagnosis Procedure"</u> . 8. CHECK SPARK PLUG
Check the initial spark plug for fouling, etc.
<u>Is the inspection result normal?</u> YES >> Replace spark plug(s) with standard type one(s). For spark plug type, refer to <u>MA-31, "SPARK PLUG : Spark</u>
NO >> Repair or clean spark plug. Then GO TO 9.
H
9.CHECK FUNCTION OF IGNITION COIL-III
 Reconnect the initial spark plugs. Crank engine for approximately 3 seconds, and recheck whether spark is generated between the spark plug and the grounded portion.
Spark should be generated.
Is the inspection result normal?
YES >> INSPECTION END NO >> Replace spark plug(s) with standard type one(s). For spark plug type, refer to <u>MA-31, "SPARK</u> <u>PLUG : Spark Plug"</u> .
10. CHECK COMPRESSION PRESSURE
Check compression pressure. Refer to <u>EM-24. "Inspection"</u> .
YES >> GO TO 11. NO >> Check pistons, piston rings, valves, valve seats and cylinder head gaskets.
11.CHECK FUEL PRESSURE
 Install all removed parts. Release fuel pressure to zero. Refer to <u>EC-153, "Work Procedure"</u>. Install fuel pressure gauge kit [SST: — (J-44321)] and check fuel pressure. Refer to <u>EC-153, "Work Proce-dure"</u>.
At idle: Approximately 350 kPa (3.57 kg/cm ² , 51 psi)
Is the inspection result normal?
YES >> GO TO 13. NO >> GO TO 12.
12. DETECT MALFUNCTIONING PART

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

Check fuel hoses and fuel tubes for clogging.

Is the inspection result normal?

- YES >> Replace "fuel filter and fuel pump assembly". Refer to <u>FL-6, "Exploded View"</u>.
- NO >> Repair or replace malfunctioning part.

13. CHECK IGNITION TIMING

Check idle speed and ignition timing.

For procedure, refer to EC-141, "Work Procedure".

For specification, refer to EC-514, "Idle Speed" and EC-514, "Ignition Timing".

Is the inspection result normal?

YES >> GO TO 14.

NO >> Follow the <u>EC-141, "Work Procedure"</u>.

14.CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT

1. Turn ignition switch OFF.

2. Disconnect corresponding A/F sensor 1 harness connector.

- 3. Disconnect ECM harness connector.
- 4. Check the continuity between A/F sensor 1 harness connector and ECM harness connector.

		A/F sensor 1		F	СМ	
-						Continuity
	Bank	Connector	Terminal	Connector	Terminal	5
	1 F28		3		66	
	I	120	4	F15	67	Existed
-	2	F65	3	FIJ	76	Existed
_	2	2 105 4			77	

5. Check the continuity between A/F sensor 1 harness connector and ground, or ECM harness connector and ground.

	A/F sensor 1	Ground	Continuity		
Bank	Connector	Terminal	Ground	Continuity	
1	1 F28				
I	F20	4	- Ground	Not existed	
2	FGF	3			
2	F65	4			

E	СМ	Ground	Continuity	
Connector	Terminal	Ground		
	66		Not existed	
F15	67	Ground		
115	76			
	77			

6. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 15.

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

15.CHECK A/F SENSOR 1 HEATER

Check A/F sensor 1 heater. Refer to EC-191, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 16.

NO >> Replace malfunctioning A/F sensor 1. Refer to EM-34, "Exploded View".

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

16.CHECK MASS AIR FLOW SENSOR	Δ
Check MAF sensor. Refer to EC-203, "Component Inspection".	17
Is the inspection result normal?	
YES >> GO TO 17. NO >> Check connectors for rusted terminals or loose connections in the mass air flow sensor circuit or	EC
ground. Refer to <u>EC-206, "Diagnosis Procedure"</u> .	
17.CHECK SYMPTOM TABLE	С
Check items on the rough idle symptom in EC-503, "Symptom Table".	
Is the inspection result normal?	D
YES >> GO TO 18.	D
NO >> Repair or replace malfunctioning part.	
18. ERASE THE 1ST TRIP DTC	Ε
Some tests may cause a 1st trip DTC to be set.	
Erase the 1st trip DTC from the ECM memory after performing the tests. Refer to EC-73, "CONSULT Func- tion".	_
	F
>> Check intermittent incident. Refer to GI-41, "Intermittent Incident".	
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< DTC/CIRCUIT DIAGNOSIS >

P0327, P0328, P0332, P0333 KS

DTC Logic

INFOID:000000012406450

[VQ35DE]

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detected condition	Possible cause
P0327	Knock sensor (bank 1) circuit low input	An excessively low voltage from the sensor is sent to ECM.	
P0328	Knock sensor (bank 1) circuit high input	An excessively high voltage from the sensor is sent to ECM.	Harness or connectors (The sensor circuit is open or shorted.)
P0332	Knock sensor (bank 2) circuit low input	An excessively low voltage from the sensor is sent to ECM.	Knock sensor
P0333	Knock sensor (bank 2) circuit high input	An excessively high voltage from the sensor is sent to ECM.	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

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

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10 V at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine and run it for at least 5 seconds at idle speed.
- 2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to EC-296, "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000012406451

1. CHECK KNOCK SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

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

DTC	Knock sensor			EC	CM	Continuity	
ыс	Bank	Connector	Terminal	Connector	Terminal	Continuity	
P0327, P0328	1	F201	2	F14	1	Existed	
P0332, P0333	2	F202	2	1 14	4	LAISted	

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

Is the inspection result normal?

YES >> GO TO 2.

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

2.CHECK KNOCK SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between knock sensor harness connector and ECM harness connector.

P0327, P0328, P0332, P0333 KS

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

DTC		Knock senso	r –	EC	M	Continuity		ŀ
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity		
P0327, P0328	1	F201	1	F14	5	Existed	_	Е
P0332, P0333	2	F202	1	114	9	Existed		
2. Also che	ck harness	for short to	o ground a	ind short to	power.		_	
s the inspect	ion result r	normal?						
	GO TO 3.	a airauit ab	art to arou	und or obord	to nowor	in harnaaa ar	onn o storo	
NO >> F 3. CHECK K	• •		on to grou		to power	in harness or o	connectors.	
Check knock			<u>297, "Com</u>	ponent Ins	pection".			
<u>s the inspect</u> YES >> 0			dont Dofe	or to CL 11	"Intormitto	nt Incident".		
						8, "Exploded \	/iew".	
Componer	•		•				INFOID:000000012406452	
	-						INFOID.000000012406452	
1. CHECK K	NOCK SEI	NSOR						
		0.55						
	tion switch							
2. Disconne	ect knock s	ensor harn			s ner the fr	ollowing		
2. Disconne	ect knock s	ensor harn		ector. terminal as	s per the fo	bllowing.		
 Disconne Check re NOTE: 	ect knock s sistance b	ensor harn etween kno	ock sensor	terminal a		bllowing. ore than 10 M	ΙΩ.	
 Disconne Check re NOTE: It is nece 	ect knock s sistance b essary to r	ensor harn etween kno u se an ohr	ock sensor	terminal a		0	ΙΩ.	
2. Disconne 3. Check re NOTE: It is nece	ect knock s sistance b essary to r	ensor harn etween kno u se an ohr Resistance	ock sensor	terminal a		0	Ω.	
2. Disconne 3. Check re NOTE: It is neco Terminals 1 and 2 A	ect knock s sistance b essary to r F Approx. 532 -	ensor harn etween kno u se an ohr	ock sensor	terminal a		0	ΙΩ.	
2. Disconne 3. Check re NOTE: It is nece Terminals 1 and 2 A CAUTIO	ect knock s sistance b essary to u F Approx. 532 - N:	ensor harn etween kno use an ohr Resistance 588 kΩ [at 20	ock sensor nmeter w ^{I°C (68°F)]}	[.] terminal a	neasure m	ore than 10 N	IΩ. maged. Use only new ones.	
2. Disconne 3. Check re NOTE: It is nece Terminals 1 and 2 A CAUTIO	ect knock s sistance b essary to r pprox. 532 - N: se any kno	ensor harn etween kno use an ohr Resistance 588 kΩ [at 20 ock sensor	ock sensor nmeter w ^{I°C (68°F)]}	[.] terminal a	neasure m	ore than 10 N		
2. Disconne 3. Check re NOTE: It is neco Terminals 1 and 2 A CAUTIO Never us s the inspect YES >> I	ect knock s esistance b essary to r r Approx. 532 - N: se any kno cion result r NSPECTIO	ensor harn etween kno use an ohr Resistance 588 kΩ [at 20 ock sensor normal? DN END	ock sensor nmeter w ^{I°C (68°F)]} rs that hav	terminal as hich can m ve been dr	neasure m opped or	ore than 10 M physically da	maged. Use only new ones.	
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Disconne Check re NOTE: It is nece Terminals 1 and 2 A CAUTIO Never us sthe inspect YES >> I	ect knock s esistance b essary to r r Approx. 532 - N: se any kno cion result r NSPECTIO	ensor harn etween kno use an ohr Resistance 588 kΩ [at 20 ock sensor normal? DN END	ock sensor nmeter w ^{I°C (68°F)]} rs that hav	terminal as hich can m ve been dr	neasure m opped or	ore than 10 M physically da	maged. Use only new ones.	
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P0335 CKP SENSOR (POS)

< DTC/CIRCUIT DIAGNOSIS >

P0335 CKP SENSOR (POS)

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P0340 or P0345 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. Refer to <u>EC-379, "DTC Logic"</u>.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0335	Crankshaft position sen- sor (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 [CKP sensor (POS) circuit is open or shorted.] Crankshaft position sensor (POS) Signal plate

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

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

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10.5 V with ignition switch ON.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

 Start engine and let it idle for at least 5 seconds. If engine does not start, crank engine for at least 2 seconds.

2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to EC-298, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000012406454

1. CHECK CRANKSHAFT POSITION (CKP) SENSOR (POS) POWER SUPPLY

- 1. Disconnect crankshaft position (CKP) sensor (POS) harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between CKP sensor (POS) harness connector and ground.

CKP sen	sor (POS)	Ground	Voltage (V)
Connector	Terminal	Ground	Voltage (V)
F20	1	Ground	Approx. 5

Is the inspection result normal?

YES >> GO TO 3.

2.CHECK CRANKSHAFT POSITION (CKP) SENSOR (POS) POWER SUPPLY CIRCUIT FOR OPEN

EC-298

INFOID:000000012406453

P0335 CKP SENSOR (POS)

< DTC/CIRCUIT DIAGNOSIS >

1.

- Turn ignition switch OFF Disconnect ECM harness connector. 2. А Check the continuity between CKP sensor (POS) harness connector and ECM harness connector. 3. CKP sensor (POS) ECM EC Continuity Connector Terminal Terminal Connector F20 F14 1 28 Existed Is the inspection result normal? YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident". NO >> Repair or replace error-detected parts. D 3.CHECK CKP SENSOR (POS) GROUND CIRCUIT FOR OPEN AND SHORT Turn ignition switch OFF. 1. 2. Disconnect ECM harness connector. Check the continuity between CKP sensor (POS) harness connector and ECM harness connector. 3. CKP sensor (POS) ECM Continuity Terminal Connector Terminal Connector F20 2 F14 40 Existed 4. Also check harness for short to ground and short to power. Is the inspection result normal? >> GO TO 4. YES Н NO >> Repair open circuit, short to ground or short to power in harness or connectors. ${f 4}$.CHECK CKP SENSOR (POS) INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT Check the continuity between CKP sensor (POS) harness connector and ECM harness connector. CKP sensor (POS) ECM Continuity Connector Terminal Connector Terminal F20 3 F14 36 Existed 2. Also check harness for short to ground and short to power. K Is the inspection result normal? YES >> GO TO 5. NO >> Repair open circuit, short to ground or short to power in harness or connectors. \mathbf{b} . CHECK CRANKSHAFT POSITION SENSOR (POS) Check crankshaft position sensor (POS). Refer to EC-299, "Component Inspection". M Is the inspection result normal? YES >> GO TO 6. NO >> Replace crankshaft position sensor (POS). Refer to EM-39, "Exploded View". Ν **O.**CHECK GEAR TOOTH Visually check for chipping signal plate gear tooth. Is the inspection result normal? YFS >> Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident".</u> >> Replace the signal plate. Refer to EM-87, "Exploded View". NO Component Inspection INEOID:000000012406455 1. CHECK CRANKSHAFT POSITION SENSOR (POS)-I Loosen the fixing bolt of the sensor. 1.
 - 2. Disconnect crankshaft position sensor (POS) harness connector.
 - 3. Remove the sensor.

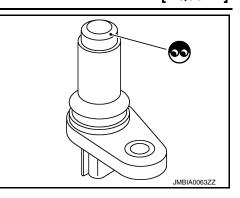
P0335 CKP SENSOR (POS)

< DTC/CIRCUIT DIAGNOSIS >

4. Visually check the sensor for chipping.

Is the inspection result normal?

NO >> Replace crankshaft position sensor (POS). Refer to <u>EM-</u> <u>39, "Exploded View"</u>.



$2. {\sf CHECK \ CRANKSHAFT \ POSITION \ SENSOR \ (POS)-II}$

Check resistance crankshaft position sensor (POS) terminals as per the following.

Terminal No. (Polarity)	Resistance
1 (+) - 2 (-)	
1 (+) - 3 (-)	Except 0 or $\infty \Omega$ [at 25°C (77°F)]
2 (+) - 3 (-)	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace crankshaft position sensor (POS). Refer to <u>EM-39</u>, "Exploded View".

< DTC/CIRCUIT DIAGNOSIS >

P0340, P0345 CMP SENSOR (PHASE)

DTC Logic

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EC

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INFOID:000000012406456

[VQ35DE]

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0340	Camshaft position sen- sor (PHASE) (bank 1) circuit		 Harness or connectors [CMP sensor (PHASE) circuit is open or shorted.] (APD sensor 2 circuit is shorted.)
P0345	Camshaft position sen- sor (PHASE) (bank 2) circuit	 The cylinder No. signal is not sent to ECM for the first few seconds during engine cranking. The cylinder No. signal is not sent to ECM during engine running. The cylinder No. signal is not in the normal pattern during engine running. 	 (APP sensor 2 circuit is shorted.) (Battery current sensor circuit is shorted.) (EOP sensor circuit is shorted.) (Refrigerant pressure sensor circuit is shorted.) Camshaft position sensor (PHASE) Camshaft (INT) Starter motor (Refer to <u>STR-6. "System</u> <u>Description".</u>) Starting system circuit (Refer to <u>STR-6. "System Description".</u>) Dead (Weak) battery Accelerator pedal position sensor Battery current sensor Engine oil pressure sensor Refrigerant pressure sensor

1.PRECONDITIONING

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

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

- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.
- TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10.5 V with ignition switch ON.

>> GO TO 2.	L	L
2.PERFORM DTC CONFIRMATION PROCEDURE-I		
 Start engine and let it idle for at least 5 seconds. If engine does not start, crank engine for at least 2 seconds. Check 1st trip DTC. 	Ν	M
Is 1st trip DTC detected?	ľ	Ν
YES >> Proceed to <u>EC-301, "Diagnosis Procedure"</u> . NO >> GO TO 3.		
3. PERFORM DTC CONFIRMATION PROCEDURE-I	C	С
 Maintaining engine speed at more than 800 rpm for at least 5 seconds. Check 1st trip DTC. 		
Is 1st trip DTC detected?	F	
YES >> Proceed to <u>EC-301, "Diagnosis Procedure"</u> . NO >> INSPECTION END		
Diagnosis Procedure	INFOID:000000012406457	
1.CHECK STARTING SYSTEM		

P0340, P0345 CMP SENSOR (PHASE)

< DTC/CIRCUIT DIAGNOSIS >

Turn ignition switch to START position.

Does the engine turn over? Does the starter motor operate?

YES >> GO TO 2.

NO >> Check starting system. Refer to <u>STR-11, "Work Flow (With GR8-1200 NI)"</u> or <u>STR-14, "Work Flow</u> (Without GR8-1200 NI)".

2. CHECK CAMSHAFT POSITION (CMP) SENSOR (PHASE) POWER SUPPLY

1. Disconnect camshaft position (CMP) sensor (PHASE) harness connector.

2. Turn ignition switch ON.

3. Check the voltage between CMP sensor (PHASE) harness connector and ground.

DTC	CM	Sensor (PH)	Ground	Voltage (V)		
DIC	Bank	Connector Terminal		Ground	voltage (v)	
P0340	1	F45 1		Ground	Approx. 5	
P0345	2	F46	1	Ground	Approx. 5	

Is the inspection result normal?

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

 $n_0 \sim 00103.$

3.HECK CMP SENSOR (PHASE) POWER SUPPLY CIRCUIT FOR OPEN

1. Turn ignition switch OFF.

2. Disconnect ECM harness connectors.

3. Check the continuity between CMP sensor (PHASE) harness connector and ECM harness connector.

DTC	CMP sensor (PHASE)			E	CM	Continuity
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0340	1	F45	1	F15	92	Existed
P0345	2	F46	1	115	92	LAISteu

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

Is the inspection result normal?

YES >> Check sensor power supply 2 circuit. Refer to <u>EC-379</u>, "Diagnosis Procedure". NO >> Repair or replace error-detected parts.

 ${f 4}$. CHECK CMP SENSOR (PHASE) GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.

2. Disconnect ECM harness connector.

3. Check the continuity between CMP sensor (PHASE) harness connector and ECM harness connector.

DTC	CM	P sensor (PH	ASE)	EC	CM	Continuity
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0340	1	F45	2	F15	90	Existed
P0345	2	F46	2	115	30	LAISICU

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

Is the inspection result normal?

YES >> GO TO 5.

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

 ${f 5.}$ CHECK CMP SENSOR (PHASE) INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between CMP sensor (PHASE) harness connector and ECM harness connector.

P0340, P0345 CMP SENSOR (PHASE)

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

DTO	CM	P sensor (PH	ASE)	EC	M	Continuity	
DTC	Bank	Connector	Terminal	Connector	Terminal	Continuity	
P0340	1	F45	3	F15	84	Existed	-
P0345	2	F46	3	115	89	LAisted	_
Also c	heck harn	ess for shoi	rt to ground	d and short	to power.		
		ult normal?					
	> GO TO (
				OR (PHASI		r in harness o	r connectors.
				•			tion II
	•	ition sensor ult normal?	(PHASE)	Refer to E	<u>C-303, "Col</u>	mponent Insp	<u>ection"</u> .
	> GO TO 7						
			ning camsl	naft position	sensor (Pl	HASE). Refer	to EM-54, "Exploded View".
.CHECK	CAMSHA	AFT (INT)					
	following.						
				e of camsha	aft rear end		
	0 1	ate of camsh ult normal?	nan rear ei	IU			
			ncident R	efer to <u>GI-4</u>	1 "Intermit	tent	
	Incident'	<u>.</u>					
NO >:				e signal pla			
		id of repl ed View".	lace cam	shaft. Refe	er to <u>Elvi</u>	<u>-07,</u>	
							5
							JMBIA0058ZZ
omnon	ent Insp	ection					INFOID:000000012406
•	•						INFOID:00000012408
.CHECK	CAMSHA	AFT POSITI	ION SENS	OR (PHASI	E)-I		
	nition swi						
		g bolt of the shaft positic		PHASE) ha	arness conr	nector.	
. Remov	ve the sen	sor.		,			
		ne sensor fo	or chipping				
•	ection rest	ult normal?					
			ioning ca	mshaft po	sition ser	nsor	
				cploded Viev			
						1	
							.JMBJA006577
.CHECK	CAMSHA		ION SENS	OR (PHASI	=)-II		JMBIA0065ZZ

Terminal No. (Polarity)	Resistance
1 (+) - 2 (-)	
1 (+) - 3 (-)	Except 0 or $\infty \Omega$ [at 25°C (77°F)]
2 (+) - 3 (-)	_

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal? YES >> INSPECTION END

NO >> Replace malfunctioning camshaft position sensor (PHASE). Refer to EM-54, "Exploded View".

< DTC/CIRCUIT DIAGNOSIS >

P0420, P0430 THREE WAY CATALYST FUNCTION

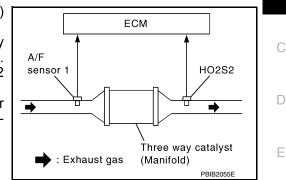
DTC Logic

DTC DETECTION LOGIC

The ECM monitors the switching frequency ratio of air fuel ratio (A/F) sensor 1 and heated oxygen sensor 2.

A three way catalyst (manifold) with high oxygen storage capacity will indicate a low switching frequency of heated oxygen sensor 2. As oxygen storage capacity decreases, the heated oxygen sensor 2 switching frequency will increase.

When the frequency ratio of A/F sensor 1 and heated oxygen sensor 2 approaches a specified limit value, the three way catalyst (manifold) malfunction is diagnosed.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0420	Catalyst system efficien- cy below threshold (bank 1)	Three way catalyst (manifold) does not oper- ate properly.	 Intake air leakage
P0430	Catalyst system efficien- cy below threshold (bank 2)		 Fuel injector Fuel injector leakage Spark plug Improper ignition timing

DTC CONFIRMATION PROCEDURE

1.INSPECTION START

Will CONSULT be used?

Will CONSULT be used?

YES >> GO TO 2. NO >> GO TO 7.

2.PRECONDITIONING

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

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

2. Turn ignition switch ON.

3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Do not maintain engine speed for more than the specified minutes below.

>> GO TO 3. **3.**PERFORM DTC CONFIRMATION PROCEDURE-I

With CONSULT

- 1. Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT.
- 2. Start engine and warm it up to the normal operating temperature.
- 3. Turn ignition switch OFF and wait at least 10 seconds.
- 4. Turn ignition switch ON.
- 5. Turn ignition switch OFF and wait at least 10 seconds.
- Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- 7. Let engine idle for 1 minute.
- 8. Check that "COOLAN TEMP/S" indicates more than 70°C (158°F).
- If not, warm up engine and go to next step when "COOLAN TEMP/S" indication reaches 70°C (158°F). 9. Open engine hood.
- 10. Select "DTC & SRT CONFIRMATION" then "SRT WORK SUPPORT" mode with CONSULT.

Revision: October 2015

EC-305

2016 Quest

[VQ35DE]

INFOID:000000012406459

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< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

11. Rev engine between 2,000 and 3,000 rpm and hold it for 3 consecutive minutes then release the accelerator pedal completely.

12. Check the indication of "CATALYST".

Which is displayed on CONSULT screen?

CMPLT>> GO TO 6.

INCMP >> GO TO 4.

4.PERFORM DTC CONFIRMATION PROCEDURE-II

1. Wait 5 seconds at idle.

2. Rev engine between 2,000 and 3,000 rpm and maintain it until "INCMP" of "CATALYST" changes to "CMPLT" (It will take approximately 5 minutes).

Does the indication change to "CMPLT"?

YES >> GO TO 6.

NO >> GO TO 5.

5.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

1. Stop engine and cool it down to less than 70°C (158°F).

2. Perform DTC CONFIRMATION PROCEDURE again.

>> GO TO 3.

6.PERFORM DTC CONFIRMATION PROCEDURE-III

Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to EC-307, "Diagnosis Procedure".

NO >> INSPECTION END

7.PERFORM COMPONENT FUNCTION CHECK

Perform component function check. Refer to EC-306. "Component Function Check".

NOTE:

Use component function check to check the overall function of the three way catalyst (manifold). During this check, a 1st trip DTC might not be confirmed.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to <u>EC-307. "Diagnosis Procedure"</u>.

Component Function Check

INFOID:000000012406460

1.PERFORM COMPONENT FUNCTION CHECK

Without CONSULT

- T. Start engine and warm it up to the normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Turn ignition switch ON.
- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- 6. Let engine idle for 1 minute.
- 7. Open engine hood.
- 8. Check the voltage between ECM harness connector terminals under the following conditions.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

		ECM			
DTC	Connec-	+	-	Condition	Voltage (V)
	tor	Terminal	Terminal		
P0420	F14	41 [HO2S2 (bank 1) signal]	35 (Sensor	Keeping engine speed at 2,500 rpm constant under no load	The voltage fluctuation cycle takes more than 5 seconds. • 1 cycle: $0.6 - 1.0 \rightarrow 0 - 0.3 \rightarrow 0.6 - 0.0 = 0.0 $
P0430		32 [HO2S2 (bank 2) signal]	ground)		1.0
•		ult normal?			
		CTION END I to <u>EC-307, "Dia</u>	<u>ignosis Pr</u>	ocedure".	
Diagnos	sis Proce	edure			INFOID:000000012406
1. CHEC	K EXHAUS	ST SYSTEM			
-		ust tubes and mu	uffler for d	ents.	
•	<u>ection res</u> →> GO TO	<u>ult normal?</u> 2			
-		∠. or replace malfur	ictioning p	part.	
2.CHEC	K EXHAUS	ST GAS LEAKAG	θE		
		d run it at idle. haust gas leakag	e before t	he three way catalyst (manifold).
	To exha	A/F sensor 1		Inifold) HO2S2 HO2	Muffler
	🔶 : Exhaust g	jas			PBIB1216E
	-	age detected?			
	> Repair of >> GO TO	or replace malfur 3.	ictioning p	bart.	
3.снеси	K INTAKE	AIR LEAKAGE			
		air leakage after	the mass	air flow sensor.	
	-	detected?			
	> Repair of >> GO TO	or replace malfur 4.	ictioning p	bart.	
4. CHEC	K IGNITIO	N TIMING			
For proce	dure, refer	to <u>EC-141, "Wo</u>	rk Proced	ure". " and <u>EC-514, "Ignition Timing</u> ".	
•		ult normal?		anu <u>LO-514, Tynillon Hiffing</u> .	
YES >	→ GO TO	5.			
_		he <u>EC-141, "Wo</u> l JECTORS	<u>k Proced</u>	ure".	

2. Check the voltage between ECM harness connector terminals.

< DTC/CIRCUIT DIAGNOSIS >

	Voltage				
Connector	Terminal	Connector	Terminal	*	
	11	- E19	152		
	12			Battery voltage	
F14	16				
1 14	17	L19			
	21	-			
	22				

Is the inspection result normal?

YES >> GO TO 6.

NO >> Perform <u>EC-479, "Diagnosis Procedure"</u>.

6.CHECK FUNCTION OF IGNITION COIL-I

CAUTION:

Perform the following procedure in a place with no combustible objects and good ventilation.

- 1. Turn ignition switch OFF.
- 2. Remove fuel pump fuse in IPDM E/R to release fuel pressure.
- NOTE:

Do not use CONSULT to release fuel pressure, or fuel pressure applies again during the following procedure.

- 3. Start engine.
- 4. After engine stalls, crank it 2 or 3 times to release all fuel pressure.
- 5. Turn ignition switch OFF.
- 6. Remove all ignition coil harness connectors to avoid the electrical discharge from the ignition coils.
- 7. Remove ignition coil and spark plug of the cylinder to be checked.
- 8. Crank engine for 5 seconds or more to remove combustion gas in the cylinder.
- 9. Connect spark plug and harness connector to ignition coil.
- 10. Fix ignition coil using a rope etc. with gap of 13 17 mm (0.52 0.66 in) between the edge of the spark plug and grounded metal portion as shown in the figure.
- 11. Crank engine for approximately 3 seconds, and check whether spark is generated between the spark plug and the grounded metal portion.

Spark should be generated.

CAUTION:

• During the operation, always stay 0.5 m (19.7 in) or more away from the spark plug and the ignition coil. Be careful not to get an electrical shock while checking, because the electrical discharge voltage becomes 20 kV or more.

• It might cause to damage the ignition coil if the gap of more than 17 mm (0.66 in) is taken. NOTE:

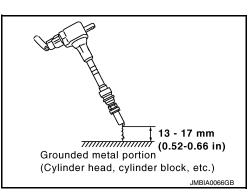
When the gap is less than 13 mm (0.52 in), the spark might be generated even if the coil is mal-functioning.

Is the inspection result normal?

YES >> GO TO 10. NO >> GO TO 7.

I.CHECK FUNCTION OF IGNITION COIL-II

- 2. Disconnect spark plug and connect a known-good spark plug.
- 3. Crank engine for approximately 3 seconds, and recheck whether spark is generated between the spark plug and the grounded metal portion.



^{1.} Turn ignition switch OFF.

< DTC/CIRCUIT DIAGNOSIS >

Spark should be generated. А Is the inspection result normal? >> GO TO 8. YES EC NO >> Check ignition coil, power transistor and their circuit. Refer to EC-484, "Diagnosis Procedure". **8.**CHECK SPARK PLUG Check the initial spark plug for fouling, etc. Is the inspection result normal? YES >> Replace spark plug(s) with standard type one(s). For spark plug type, refer to MA-31, "SPARK PLUG : Spark D Plua". NO >> Repair or clean spark plug. Then GO TO 9. Ε F SEF156I 9.CHECK FUNCTION OF IGNITION COIL-III 1. Reconnect the initial spark plugs. 2. Crank engine for approximately 3 seconds, and recheck whether spark is generated between the spark plug and the grounded portion. Spark should be generated. Н Is the inspection result normal? YES >> INSPECTION END NO >> Replace spark plug(s) with standard type one(s). For spark plug type, refer to MA-31, "SPARK PLUG : Spark Plug". 10. CHECK FUEL INJECTOR Turn ignition switch OFF. 1. Remove fuel injector assembly. Refer to EM-49, "Exploded View". 2. Refer to EM-49, "Exploded View". Κ Keep fuel hose and all fuel injectors connected to fuel tube. 3. Disconnect all ignition coil harness connectors. 4. Reconnect all fuel injector harness connectors disconnected. 5. Turn ignition switch ON. L 6. Check that the fuel does not drip from fuel injector. Does fuel drip from fuel injector? YES >> Replace the fuel injector(s) from which fuel is dripping. Refer to EM-49, "Exploded View". Μ >> GO TO 11. NO 11. CHECK INTERMITTENT INCIDENT Ν Check intermittent incident. Refer to GI-41, "Intermittent Incident". Is the inspection result normal? YES >> Replace three way catalyst assembly. Refer to EM-34, "Exploded View". Ο NO >> Repair or replace error-detected parts.

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IVQ35DE1

P0441 EVAP CONTROL SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

P0441 EVAP CONTROL SYSTEM

DTC Logic

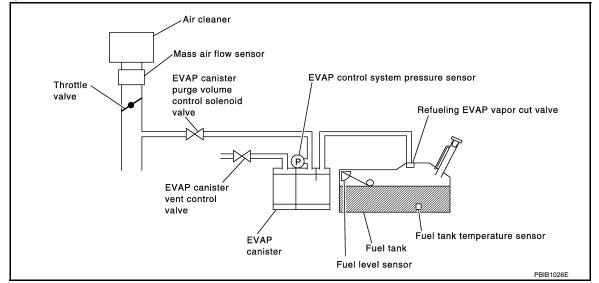
DTC DETECTION LOGIC

NOTE:

If DTC P0441 is displayed with other DTC such as P2122, P2123, P2127, P2128 or P2138, first perform trouble diagnosis for other DTC.

In this evaporative emission (EVAP) control system, purge flow occurs during non-closed throttle conditions. Purge volume is related to air intake volume. Under normal purge conditions (non-closed throttle), the EVAP canister purge volume control solenoid valve is open to admit purge flow. Purge flow exposes the EVAP control system pressure sensor to intake manifold vacuum.

Under normal conditions (non-closed throttle), sensor output voltage indicates if pressure drop and purge flow are adequate. If not, a malfunction is determined.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0441	EVAP control system in- correct purge flow	EVAP control system does not operate proper- ly, EVAP control system has a leakage between intake manifold and EVAP control system pres- sure sensor.	 EVAP canister purge volume control solenoid valve stuck closed EVAP control system pressure sensor and the circuit Loose, disconnected or improper connection of rubber tube Blocked rubber tube Cracked EVAP canister EVAP canister purge volume control solenoid valve circuit Accelerator pedal position sensor Blocked purge port EVAP canister vent control valve

DTC CONFIRMATION PROCEDURE

1.INSPECTION START

Will CONSULT be used?

Will CONSULT be used?

YES >> GO TO 2. NO >> GO TO 6.

2.PRECONDITIONING

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

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

INFOID:000000012406462

P0441 EVAP CONTROL SYSTEM [VQ35DE] < DTC/CIRCUIT DIAGNOSIS > 2. Turn ignition switch ON. Turn ignition switch OFF and wait at least 10 seconds. 3. А **TESTING CONDITION:** Always perform test at a temperature of 5°C (41°F) or more. EC >> GO TO 3. **3.** PERFORM DTC CONFIRMATION PROCEDURE-I With CONSULT 1. Start engine and warm it up to normal operating temperature. 2. Turn ignition switch OFF and wait at least 10 seconds. D 3. Turn ignition switch ON. 4. Turn ignition switch OFF and wait at least 10 seconds. 5. Start engine and let it idle for at least 70 seconds. 6 Select "PURG FLOW P0441" of "EVAPORATIVE SYSTEM" in "DTC WORK SUPPORT" mode with CON-E SULT. Touch "START". 7. Is "COMPLETED" displayed on CONSULT screen? YES >> GO TO 5. NO >> GO TO 4. 4.PERFORM DTC CONFIRMATION PROCEDURE-II When the following conditions are met, "TESTING" will be displayed on the CONSULT screen. Maintain the conditions continuously until "TESTING" changes to "COMPLETED". (It will take at least 35 seconds.) Н Selector lever Suitable position VHCL SPEED SE 32 - 120 km/h (20 - 75 mph) ENG SPEED 500 - 3,000 rpm **B/FUEL SCHDL** 1.3 - 9.0 msec COOLAN TEMP/S More than 0°C (32°F) **CAUTION:** Always drive vehicle at a safe speed. If "TESTING" does not change for a long time, retry from step 2. Κ Is "COMPLETED" displayed on CONSULT screen? YES >> GO TO 5. NO >> Perform DTC CONFIRMATION PROCEDURE again. GO TO 3. 5. PERFORM DTC CONFIRMATION PROCEDURE-III Touch "SELF-DIAG RESULTS". M Which is displayed on CONSULT screen? OK >> INSPECTION END NG >> Proceed to EC-312, "Diagnosis Procedure". Ν $\mathbf{6}$.PERFORM COMPONENT FUNCTION CHECK Perform component function check. Refer to EC-311. "Component Function Check". NOTE: Use component function check to check the overall monitoring function of the EVAP control system purge flow monitoring. During this check, a 1st trip DTC might not be confirmed. Is the inspection result normal? Ρ >> INSPECTION END YES NO >> Proceed to EC-312, "Diagnosis Procedure". Component Function Check INEOID-000000012406463 1. PERFORM COMPONENT FUNCTION CHECK Without CONSULT

P0441 EVAP CONTROL SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

- 1. 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. Turn ignition switch ON.
- 5. Turn ignition switch OFF, wait at least 10 seconds.
- 6. Start engine and wait at least 70 seconds.
- 7. Set voltmeter probes to ECM harness connector terminals under the following conditions.

ECM					
Connector	+	-			
Connector	Terminal	Terminal			
E19	121 (EVAP control system pressure sensor signal)	148 (Sensor ground)			

8. Check EVAP control system pressure sensor value at idle speed and note it.

9. Establish and maintain the following conditions for at least 1 minute.

Air conditioner switch	ON
Head lamp switch	ON
Rear window defogger switch	ON
Engine speed	Approx. 3,000 rpm
Gear position	Any position other than P, N or R

10. Verify that EVAP control system pressure sensor value stays 0.1 V less than the value at idle speed (measured at step 6) for at least 1 second.

Is the inspection result normal?

YES >> INSPECTION END NO >> Proceed to <u>EC-312</u>, "Diagnosis Procedure".

Diagnosis Procedure

1.CHECK EVAP CANISTER

1. Turn ignition switch OFF.

2. Check EVAP canister for cracks.

Is the inspection result normal?

- YES-1 >> With CONSULT: GO TO 2.
- YES-2 >> Without CONSULT: GO TO 3.
- NO >> Replace EVAP canister. Refer to <u>FL-17, "Exploded View"</u>.

2.CHECK PURGE FLOW

With CONSULT

- 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-51</u>, <u>"EVAPORATIVE EMISSION SYSTEM : System Description"</u>.
- 2. Start engine and let it idle.
- 3. Select "PURG VOL C/V" in "ACTIVE TEST" mode with CONSULT.
- Touch "Qd" and "Qu" on CONSULT screen to adjust "PURG VOL C/V" opening and check vacuum existence.

PURG VOL C/V	Vacuum
100%	Existed
0%	Not existed

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 4. INFOID:000000012406464

P0441 EVAP CONTROL SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

3.CHECK PURGE FLOW		А
 Without CONSULT Start engine and warm it up to normal operating temperature. Stop engine. 		EC
 Disconnect vacuum hose connected to EVAP canister purge volu vice port and install vacuum gauge. For the location of EVAP servi EMISSION SYSTEM : System Description". 	ime control solenoid valve at EVAP ser-	EC
 Start engine and let it idle. Do not depress accelerator pedal even slightly. Check vacuum gauge indication before 60 seconds pass after statements. 	irting engine.	С
Vacuum should not exist.		D
6. Rev engine up to 2,000 rpm after 100 seconds pass after starting	engine.	
Vacuum should exist.		E
<u>Is the inspection result normal?</u> YES >> GO TO 7. NO >> GO TO 4.		F
4. CHECK EVAP PURGE LINE		G
 Turn ignition switch OFF. Check EVAP purge line for improper connection or disconnection Refer to EC-51, "EVAPORATIVE EMISSION SYSTEM : System I 		0
Is the inspection result normal?	<u> </u>	Η
YES >> GO TO 5. NO >> Repair EVAP purge line.		I
5. CHECK EVAP PURGE HOSE AND PURGE PORT		I
 Disconnect purge hoses connected to EVAP service port A and EVAP canister purge volume control solenoid valve B. Blow air into each hose and EVAP purge port C. 	EVAP service port	J
		K
	purge volume control solenoid valve	L
	Intake manifold SEF367U	Μ
3. Check that air flows freely.		
Is the inspection result normal? YES-1 >> With CONSULT: GO TO 6. YES-2 >> Without CONSULT: GO TO 7. NO >> Repair or clean hoses and/or purge port.	(7) E = 3	N O
	 Intake manifold	Ρ
6. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENCE	SEF368U	

(B) With CONSULT 1. Start engine.

- Start engine.
- 2. Perform "PURG VOL C/V" in "ACTIVE TEST" mode with CONSULT. Check that engine speed varies according to the valve opening.

P0441 EVAP CONTROL SYSTEM
< DTC/CIRCUIT DIAGNOSIS > [VQ35DE
Does engine speed vary according to the valve opening?
YES >> GO TO 8. NO >> GO TO 7.
7. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE
Check EVAP canister purge volume control solenoid valve. Refer to EC-318, "Component Inspection".
Is the inspection result normal?
YES >> GO TO 8.
NO >> Replace EVAP canister purge volume control solenoid valve. Refer to <u>FL-17, "Exploded View"</u> . 8. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR CONNECTOR
Disconnect EVAP control system pressure sensor harness connector.
 Check that water is not inside connectors.
Is the inspection result normal?
YES >> GO TO 9. NO >> Replace EVAP control system pressure sensor. Refer to <u>FL-17, "Exploded View"</u> .
9. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR FUNCTION
Check EVAP control system pressure sensor function. Refer to EC-334, "DTC Logic" for DTC P0452, EC-337
"DTC Logic" for DTC P0453.
<u>Is the inspection result normal?</u> YES >> GO TO 10.
NO >> Replace EVAP control system pressure sensor. Refer to <u>FL-17, "Exploded View"</u> .
10.CHECK RUBBER TUBE FOR CLOGGING
 Disconnect rubber tube connected to EVAP canister vent control valve. Check the rubber tube for clogging.
Is the inspection result normal?
YES >> GO TO 11.
NO >> Clean the rubber tube using an air blower.
11.CHECK EVAP CANISTER VENT CONTROL VALVE
Check EVAP canister vent control valve. Refer to <u>EC-325. "Component Inspection"</u> .
<u>Is the inspection result normal?</u> YES >> GO TO 12.
NO >> Replace EVAP canister vent control valve. Refer to <u>FL-17</u> , "Exploded View".
12.CHECK EVAP PURGE LINE
Inspect EVAP purge line (pipe and rubber tube). Check for evidence of leakage. Refer to <u>EC-51, "EVAPORATIVE EMISSION SYSTEM : System Description"</u> .
Is the inspection result normal?
YES >> GO TO 13. NO >> Repair EVAP purge line.
13. CLEAN EVAP PURGE LINE
Clean EVAP purge line (pipe and rubber tube) using air blower.
>> Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u> .

< DTC/CIRCUIT DIAGNOSIS >

P0443 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

DTC Logic

INFOID:000000012406465

[VQ35DE]

DTC DETECTION LOGIC

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	1			
DTC No.	Trouble diagnosis name		DTC detecting condition	Possible cause
P0443	EVAP canister purge volume control solenoid	A	The canister purge flow is detected dur- ing the cehicle is stopped while the en- gine is running, 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
0443	valve	В	The canister purge flow is detected dur- ing the specified driving conditions, even when EVAP canister purge volume con- trol solenoid valve is completely closed.	 EVAP canister vent control valve EVAP canister Hoses (Hoses are connected incorrectly or clogged.)
	FIRMATION PROC	EDU	RE	
.PRECO	NDITIONING			
	nfirmation Procedure ducting the next test.	has	been previously conducted, alwa	ays perform the following procedure
I. Turn ig	nition switch OFF and	l wait	at least 10 seconds.	
6. Turn ig	nition switch ON. Inition switch OFF and	l wait	at least 10 seconds.	
ESTING	CONDITION:			al is between 1/4 and 2/4 full and
vehicle is	s placed on flat level	surf	ace.	el is between 1/4 and 3/4 full, and
			ture of 5 to 60°C (41 to 140°F). polant temperature becomes sam	no loval as ambient temperature
	ve CONSULT		Solant temperature becomes san	ie ievel as ambient temperature.
YES >>	> GO TO 2.			
	> GO TO 4.			
PERFO	RM DTC CONFIRMA	HON	PROCEDURE A	
With CC . Turn io	ONSULT Inition switch ON.			
2. Check	that the following con			
	T/TMP SE: 0 - 35°C (3 nfine and wait at least			
	1st trip DTC.			
	DTC detected?			
	Proceed to <u>EC-316.</u> GO TO 3.	"Diag	anosis Procedure".	
•	RM DTC CONFIRMA	ΓΙΟΝ	PROCEDURE B	
With CC				
. Start e	ngine and warm it up		rmal operating temperature.	
	nition switch OFF and nition switch ON.	i wait	at least 10 seconds.	
4. Turn ig	nition switch OFF and	l wait	at least 10 seconds.	
 Select CONS 	ULT.	1444	" of "EVAPORATIVE SYSTEM" in	"DTC WORK SUPPORT" mode with
	"START".	til "T	ESTING" on CONSLILT changes to	"COMPLETED". (It will take approxi-
	10 seconds.)		LOTING ON CONSOLT CHanges to	

If "TESTING" is not displayed after 5 minutes, retry from step 2.

Revision: October 2015

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2016 Quest

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

9. Touch "SELF-DIAG RESULTS".

Which is displayed on CONSULT screen?

YES >> INSPECTION END

NO >> Proceed to <u>EC-316, "Diagnosis Procedure"</u>.

4.PERFORM DTC CONFIRMATION PROCEDURE A

With GST

1. Turn ignition switch ON.

2. Set voltmeter probes to ECM harness connector terminals.

Connector	+	_	Voltage (V)
Connector	Terminal	Terminal	
E19	128 (Fuel tank temperature sensor signal)	148 (Sensor ground)	3.1 - 4.0

3. Start engine and wait at least 60 seconds.

4. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to EC-316, "Diagnosis Procedure".

NO >> GO TO 5.

5. PERFORM DTC CONFIRMATION PROCEDURE B

With GST

- 1. Start engine and warm it up to normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Turn ignition switch ON.
- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Start engine and let it idle for at least 20 seconds.
- 6. Check 1st trip DTC.

Is 1st trip DTC displayed?

YES >> Proceed to EC-316, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000012406466

1. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE POWER SUPPLY

- 1. Turn ignition switch OFF.
- 2. Disconnect EVAP canister purge volume control solenoid valve harness connector.
- 3. Turn ignition switch ON.
- 4. Check the voltage between EVAP canister purge volume control solenoid valve harness connector and ground.

EVAP canister purge volume control solenoid valve		Ground	Voltage	
Connector	Terminal			
F30	1	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE POWER SUPPLY CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect IPDM E/R harness connector.
- 3. Check the continuity between EVAP canister purge volume control solenoid valve harness connector and IPDM E/R harness connector.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

	urge volume oid valve	IPDN		Continuity	
Connector	Terminal	Connector	Terminal		
F30	1	E10	10	Existed	
-	n result norma		f		
0 >> Rep	pair or replace	error-detect	•		VALVE OUTPUT SIGNAL CIRCUIT
R OPEN AN		FURGE VC		ROL SOLENOID	VALVE OUTPUT SIGNAL CIRCUIT
_	n switch OFF.				
Disconnect	ECM harness				
	continuity betw ss connector.	een EVAP c	anister purge	volume control so	plenoid valve harness connector and
Lowname					
VAP canister pu	Irge volume con-		ECM		_
trol solen	oid valve			Continuity	
Connector	Terminal	Connecto			
F30	2	F14	54	Existed	
		-	d and short to	power.	
•	n result norma	<u> ?</u>			
ES >> GO O >> Rer		it short to a	round or short	to power in harn	ess or connectors.
		-		NSOR CONNEC	
			euro concor h	arness connector	
	water is not in			arness connector	
Check that		side connec		arness connector	
Check that the inspection ES >> GO	water is not in <u>n result norma</u> n TO 5.	side connect <u>?</u>	tors.		
Check that the inspection ES >> GO O >> Rep	water is not in <u>n result norma</u> TO 5. place EVAP co	side connect <u> 12</u> ontrol system	tors.) pressure sens	sor. Refer to <u>FL-1</u>	7, "Exploded View".
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Check that he inspection ES >> GO O >> Rep CHECK EVAP co he inspection ES-1 >> Wit ES-2 >> Wit O >> Rep CHECK EVA With CONSU Turn ignition Reconnect Start engine	water is not in <u>result norma</u> TO 5. place EVAP co P CONTROL ontrol system p <u>n result norma</u> h CONSULT: (hout CONSUL place EVAP co P CANISTER ILT n switch OFF. harness conne e.	side connect Partrol system SYSTEM PF ressure sen POTO 6. T: GO TO 7. ontrol system PURGE VO PURGE VO	tors. a pressure sense RESSURE SEI sor. Refer to <u>E</u> a pressure sense LUME CONTF annected.	sor. Refer to <u>FL-1</u> NSOR <u>C-333, "Compon</u> sor. Refer to <u>FL-1</u> ROL SOLENOID	7, "Exploded View". ent Inspection". 7, "Exploded View". VALVE
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Check that the inspection ES >> GO O >> Rep CHECK EVA eck EVAP co the inspection ES-1 >> Wit ES-2 >> Wit O >> Rep CHECK EVA With CONSU Turn ignition Reconnect Start engine Perform "P according to es engine sp ES >> GO O >> GO CHECK EVA	water is not in <u>result norma</u> TO 5. place EVAP co P CONTROL ontrol system p <u>n result norma</u> h CONSULT: (hout CONSUL place EVAP co NP CANISTER ILT n switch OFF. harness conne URG VOL C/ p the valve op <u>eed vary acco</u> TO 8. TO 7. P CANISTER	side connect 2 ontrol system SYSTEM PF ressure sen 2 GO TO 6. T: GO TO 7. ontrol system PURGE VO PURGE VO PURGE VO	tors. a pressure sense RESSURE SEI sor. Refer to <u>E</u> a pressure sense LUME CONTF annected. /E TEST" mode valve opening? LUME CONTF	sor. Refer to FL-1 NSOR C-333, "Compon sor. Refer to FL-1 ROL SOLENOID de with CONSUI	7, "Exploded View". ent Inspection". 7, "Exploded View". VALVE T. Check that engine speed varies
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EC-317

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

8.CHECK RUBBER TUBE FOR CLOGGING

1. Disconnect rubber tube connected to EVAP canister vent control valve.

2. Check the rubber tube for clogging.

Is the inspection result normal?

YES >> GO TO 9.

NO >> Clean the rubber tube using an air blower.

9.CHECK EVAP CANISTER VENT CONTROL VALVE

Check EVAP canister vent control valve. Refer to EC-325. "Component Inspection".

Is the inspection result normal?

YES >> GO TO 10.

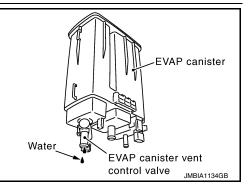
NO >> Replace EVAP canister vent control valve. Refer to <u>FL-17, "Exploded View"</u>.

10. CHECK IF EVAP CANISTER IS SATURATED WITH WATER

Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached. Refer to <u>FL-17</u>, <u>"Exploded View"</u>.

Does water drain from the EVAP canister?

- YES >> GO TO 11.
- NO >> Check intermittent incident. Refer to <u>GI-41. "Intermittent</u> <u>Incident"</u>.



11.CHECK EVAP CANISTER

Weigh the EVAP canister with the EVAP canister vent control valve and EVAP control system pressure sensor attached.

The weight should be less than 2.1 kg (4.6 lb).

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41. "Intermittent Incident".

NO >> GO TO 12.

12. DETECT MALFUNCTIONING PART

Check the following.

- EVAP canister for damage
- EVAP hose between EVAP canister and vehicle frame for clogging or poor connection

>> Repair hose or replace EVAP canister. Refer to FL-17, "Exploded View".

Component Inspection

INFOID:000000012406467

1. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

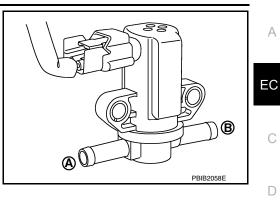
With CONSULT

- 1. Turn ignition switch OFF.
- 2. Reconnect all harness connectors disconnected.
- 3. Disconnect EVAP purge hoses connected to EVAP canister purge volume control solenoid valve.
- 4. Turn ignition switch ON.
- 5. Select "PURG VOL C/V" in "ACTIVE TEST" mode with CONSULT.

< DTC/CIRCUIT DIAGNOSIS >

6. Touch "Qd" and "Qu" on CONSULT screen to adjust "PURG VOL C/V" opening and check air passage continuity of EVAP canister purge volume control solenoid valve under the following conditions.

Condition (PURG VOL C/V value)	Air passage continuity between (A) and (B)
100%	Existed
0%	Not existed



Without CONSULT

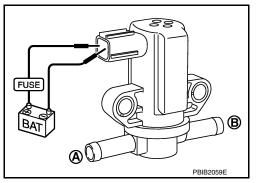
- Ĩ. Turn ignition switch OFF.
- 2. Disconnect EVAP canister purge volume control solenoid valve harness connector.
- 3. Disconnect EVAP purge hoses connected to EVAP canister purge volume control solenoid valve.
- 4. Check air passage continuity of EVAP canister purge volume control solenoid valve under the following conditions.

Condition	Air passage continuity between (A) and (B)
12 V direct current supply between terminals 1 and 2	Existed
No supply	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace EVAP canister purge volume control solenoid valve. Refer to FL-17, "Exploded View".



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< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

P0444, P0445 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

DTC Logic

INFOID:000000012406468

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0444	EVAP canister purge volume control solenoid valve circuit open	An excessively low voltage signal is sent to ECM through the valve	 Harness or connectors (The solenoid valve circuit is open or shorted.) EVAP canister purge volume control so- lenoid valve
P0445	EVAP canister purge volume control solenoid valve circuit shorted	An excessively high voltage signal is sent to ECM through the valve	 Harness or connectors (The solenoid valve circuit is shorted.) EVAP canister purge volume control so- lenoid valve

DTC CONFIRMATION PROCEDURE

1.CONDITIONING

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

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

TESTING CONDITION:

Before performing the following procedure, confirm battery voltage is more than 11 V at idle.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and let it idle for at least 13 seconds.

2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to EC-320, "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000012406469

1. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE POWER SUPPLY

- 1. Turn ignition switch OFF.
- 2. Disconnect EVAP canister purge volume control solenoid valve harness connector.

3. Turn ignition switch ON.

4. Check the voltage between EVAP canister purge volume control solenoid valve harness connector and ground.

EVAP canister purge volume control solenoid valve		Ground	Voltage
Connector	Terminal		
F30	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.

< DTC/CIRCUIT DIAGNOSIS >

2. Disconnect IPDM E/R harness connector.

 Check the continuity between EVAP canister purge volume control solenoid valve harness connector and IPDM E/R harness connector.

	r purge volume enoid valve	IPDM E/R		Continuity
Connector	Terminal	Connector Terminal		
F30	1	E10	10	Existed

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit.

NO >> Repair or replace error-detected parts.

3 .CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OUTPUT SIGNAL CIRCUIT	
FOR OPEN AND SHORT	E

1. Turn ignition switch OFF.

2. Disconnect ECM harness connector.

3. Check the continuity between EVAP canister purge volume control solenoid valve harness connector and ECM harness connector.

•	urge volume con- noid valve	EC	CM	Continuity
Connector	Terminal	Connector	Terminal	
F30	2	F14	54	Existed

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

Is the inspection result normal?

YES-1 >> With CONSULT: GO TO 4.

- YES-2 >> Without CONSULT: GO TO 5.
- NO >> Repair open circuit, short to ground or short to power in harness or connectors.

4.CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

With CONSULT

- 1. Reconnect all harness connectors disconnected.
- 2. Start engine.
- Perform "PURG VOL C/V" in "ACTIVE TEST" mode with CONSULT. Check that engine speed varies according to the valve opening.

Does engine speed vary according to the valve opening?

YES >> Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u>.

NO >> GO TO 5. 5.CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Check EVAP canister purge volume control solenoid valve. Refer to EC-321. "Component Inspection".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".

NO >> Replace EVAP canister purge volume control solenoid valve. Refer to <u>FL-17, "Exploded View"</u>.

Component Inspection

1. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

With CONSULT

- 1. Turn ignition switch OFF.
- 2. Reconnect all harness connectors disconnected.
- 3. Disconnect EVAP purge hoses connected to EVAP canister purge volume control solenoid valve.
- 4. Start engine.
- 5. Select "PURG VOL C/V" in "ACTIVE TEST" mode with CONSULT.

INFOID:000000012406470

[VQ35DE]

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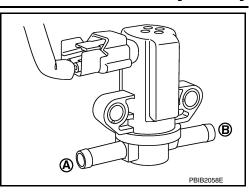
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< DTC/CIRCUIT DIAGNOSIS >

6. Touch "Qd" and "Qu" on CONSULT screen to adjust "PURG VOL C/V" opening and check air passage continuity of EVAP canister purge volume control solenoid valve under the following conditions.

Condition (PURG VOL C/V value)	Air passage continuity between (A) and (B)
100%	Existed
0%	Not existed



[VQ35DE]

Without CONSULT

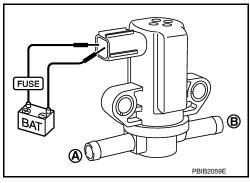
- 1. Turn ignition switch OFF.
- 2. Disconnect EVAP canister purge volume control solenoid valve harness connector.
- 3. Disconnect EVAP purge hoses connected to EVAP canister purge volume control solenoid valve.
- 4. Check air passage continuity of EVAP canister purge volume control solenoid valve under the following conditions.

Condition	Air passage continuity between (A) and (B)
12 V direct current supply between terminals 1 and 2	Existed
No supply	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace EVAP canister purge volume control solenoid valve. Refer to <u>FL-17, "Exploded View"</u>.



P0447 EVAP CANISTER VENT CONTROL VALVE

< DTC/CIRCUIT DIAGNOSIS >

P0447 EVAP CANISTER VENT CONTROL VALVE

DTC Logic

INFOID:000000012406471

[VQ35DE]

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DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0447	EVAP canister vent con- trol 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 Hoses (Hoses are connected incorrectly or clogged.)
DTC CON	FIRMATION PROC	EDURE	
1.PRECO	NDITIONING		
ing the nex 1. Turn ig 2. Turn ig 3. Turn ig TESTING (t test. nition switch OFF and nition switch ON. nition switch OFF and CONDITION:	as been previously conducted, always wait at least 10 seconds. wait at least 10 seconds. g procedure, confirm battery voltag	s perform the following before conduct- ge is more than 11 V at idle.
>>	GO TO 2.		
-	RM DTC CONFIRMA	TION PROCEDURE	
2. Check Is 1st trip D YES >>	ngine and wait at leas 1st trip DTC. <u>TC detected?</u> Proceed to <u>EC-323,</u> INSPECTION END	t 8 seconds. "Diagnosis Procedure".	
-	s Procedure		INFOID:000000012406472
1.INSPEC	TION START		
Will CONS	ULT be used?		-
YES >> NO >>	ULT be used? • GO TO 2. • GO TO 3.		
Z.CHECK	EVAP CANISTER VE	NT CONTROL VALVE CIRCUIT	
 Select Touch 	nition switch OFF and	in "ACTIVE TEST" mode with CONSU	JLT.
Clic	king sound should l	be heard.	
	ection result normal?		
	• GO TO 6. • GO TO 3.		
-		NT CONTROL VALVE POWER SUPP	PLY
	nition switch OFF.		

1. Turn ignition switch OFF.

2. Disconnect EVAP canister vent control valve harness connector.

P0447 EVAP CANISTER VENT CONTROL VALVE

< DTC/CIRCUIT DIAGNOSIS >

3. Turn ignition switch ON.

4. Check the voltage between EVAP canister vent control valve harness connector and ground.

EVAP canister vent control valve		Ground	Voltage
Connector	Terminal	Ground	voltage
B66	1	Ground	Battery voltage
		-	

Is the inspection result normal?

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

4.CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE POWER SUPPLY CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect IPDM E/R harness connector.
- 3. Check the continuity between EVAP canister purge volume control solenoid valve harness connector and IPDM E/R harness connector.

EVAP canister vent control valve		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
B66	1	F12	53	Existed

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit.

NO >> Repair or replace error-detected parts.

5. CHECK EVAP CANISTER VENT CONTROL VALVE OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check the continuity between ECM harness connector and EVAP canister vent control valve harness connector.

Refer to Wiring Diagram.

EVAP canister vent control valve		ECM		Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
B66	2	E19	141	Existed	

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

Is the inspection result normal?

YES >> GO TO 6.

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

6.CHECK RUBBER TUBE FOR CLOGGING

1. Disconnect rubber tube connected to EVAP canister vent control valve.

2. Check the rubber tube for clogging.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Clean the rubber tube using an air blower.

I.CHECK EVAP CANISTER VENT CONTROL VALVE

Check EVAP canister vent control valve. Refer to EC-325, "Component Inspection".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u>.

NO >> Replace EVAP canister vent control valve. Refer to <u>FL-17</u>, "Exploded View".

[VQ35DE]

< DTC/CIRCUIT DIAGNOSIS >

Component Inspection

INFOID:000000012406473

[VQ35DE]

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1.CHECK EVAP CANISTER VENT CONTROL VALVE-I

 Remove EVAP canister vent control valve from EVAP canister. Refer to FL-17, "Exploded View".
 Check portion (A) of EVAP canister vent control valve for rust. Is it rusted? YES >> Replace EVAP canister vent control valve. Refer to FL-<u>17, "Exploded View"</u>. NO >> GO TO 2.
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With CONSULT

- 1. Reconnect harness connectors disconnected.
- 2. Turn ignition switch ON.
- 3. Perform "VENT CONTROL/V" in "ACTIVE TEST" mode.
- 4. Check air passage continuity and operation delay time. Check that new O-ring is installed properly.

Condition VENT CONTROL/V	Air passage continuity between (A) and (B)
ON	Not existed
OFF	Existed

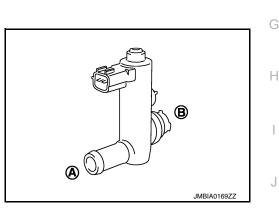
Operation takes less than 1 second.

Without CONSULT

- 1. Disconnect EVAP canister vent control valve harness connector.
- 2. Check air passage continuity and operation delay time under the
- following conditions. Check that new O-ring is installed properly.

Condition	Air passage continuity between (A) and (B)	
12 V direct current supply between terminals 1 and 2	Not existed	
OFF	Existed	
Operation takes less than 1 second		
Is the inspection result normal?	2	
YES >> INSPECTION END)	
NO >> GO TO 3.		
3. CHECK EVAP CANISTER \setminus	/ENT CONTROL VALVE-III	
1. Clean the air passage [por	tion (A) to (B)] of EVAP canister vent	control valve using an air blower.
2. Perform "VENT CONTROL	_/V" in "ACTIVE TEST" mode.	

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< DTC/CIRCUIT DIAGNOSIS >

3. Check air passage continuity and operation delay time. Check that 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.

Without CONSULT

- 1. Clean the air passage [portion (A) to (B)] of EVAP canister vent control valve using an air blower.
- 2. Check air passage continuity and operation delay time under the following conditions.

Check that new O-ring is installed properly.

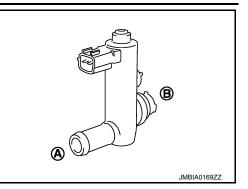
Condition	Air passage continuity between (A) and (B)	
12 V direct current supply between terminals (1) and (2)	No	
OFF	Yes	

Operation takes less than 1 second.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace EVAP canister vent control valve. Refer to <u>FL-17, "Exploded View"</u>.



[VQ35DE]

< DTC/CIRCUIT DIAGNOSIS >

P0448 EVAP CANISTER VENT CONTROL VALVE

DTC Logic

INFOID:000000012406474

[VQ35DE]

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DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0448	EVAP canister vent con- trol valve close	EVAP canister vent control valve remains closed under specified driving conditions.	 EVAP canister vent control valve EVAP control system pressure sensor and the circuit Blocked rubber tube to EVAP canister vent control valve EVAP canister is saturated with water
	FIRMATION PROCI	EDURE	
.PRECO	NDITIONING		
ng the nex 1. Turn ig 2. Turn ig	t test. nition switch OFF and nition switch ON.	as been previously conducted, always wait at least 10 seconds. wait at least 10 seconds.	s perform the following before conduct-
>>	GO TO 2.		
2.PERFO	RM DTC CONFIRMAT	TION PROCEDURE	
2. Turn ig 3. Turn ig 4. Start e	nition switch ON and vition switch OFF and		ONSULT.
Increas utes.	se the engine speed u	ip to 3,000 to 3,500 rpm and keep it fo	or 2 minutes and 50 seconds to 3 min-
Never ex	ceed 3 minutes.		
	eleased accelerator pe t next procedure 20 tir	edal and keep engine idle for about 5 s nes.	seconds.
Quickly	/ increase the engine	speed up to 4,000 to 4,500 rpm or mo edal and keep engine idle for at least 3	
	Engine speed 4,000 rpm 3,000 rpm	Never exceed 3 minutes	3
	ldle O rpm	5 seconds 25 to 30 More th 1 minute 2 minutes and 50 seconds 35 seconds	
7. Check	Engine 1st trip DTC.	start seconds to 3 minutes	PBIB0972E
	TC detected?		
	 Proceed to <u>EC-327</u>, INSPECTION END 	"Diagnosis Procedure".	
NU /			
-	s Procedure		INFOID:000000012406475
Diagnosi	s Procedure RUBBER TUBE		INFOID:000000012406475

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

- 2. Disconnect rubber tube connected to EVAP canister vent control valve.
- 3. Check the rubber tube for clogging.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Clean rubber tube using an air blower.

2.check evap canister vent control valve

Check EVAP canister vent control valve. Refer to EC-329, "Component Inspection".

Is he inspection result normal?

YES >> GO TO 3.

NO >> Replace EVAP canister vent control valve. Refer to <u>FL-17, "Exploded View"</u>.

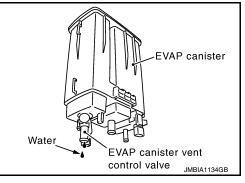
3.CHECK IF EVAP CANISTER SATURATED WITH WATER

 Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached. Refer to <u>FL-17, "Exploded View"</u>.

2. Check if water will drain from the EVAP canister.

Does water drain from the EVAP canister?

- YES >> GO TO 4.
- NO >> GO TO 6.



4.CHECK EVAP CANISTER

Weigh the EVAP canister with the EVAP canister vent control valve and EVAP control system pressure sensor attached.

The weight should be less than 2.1 kg (4.6 lb).

Is the inspection result normal?

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

5.DETECT MALFUNCTIONING PART

Check the following.

EVAP canister for damage

• EVAP hose between EVAP canister and vehicle frame for clogging or poor connection

>> Repair hose or replace EVAP canister. Refer to FL-17, "Exploded View".

6.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR CONNECTOR

1. Disconnect EVAP control system pressure sensor harness connector.

2. Check that water is not inside connectors.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace EVAP control system pressure sensor. Refer to <u>FL-17, "Exploded View"</u>.

7.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Check EVAP control system pressure sensor. Refer to EC-333, "Component Inspection".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u>.

NO >> Replace EVAP control system pressure sensor. Refer to <u>FL-17, "Exploded View"</u>.

< DTC/CIRCUIT DIAGNOSIS >

Component Inspection

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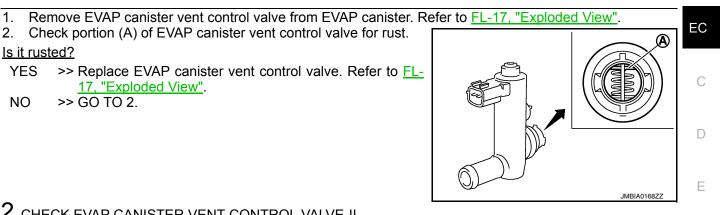
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[VQ35DE]

1.CHECK EVAP CANISTER VENT CONTROL VALVE-I



2. CHECK EVAP CANISTER VENT CONTROL VALVE-II

(P)With CONSULT

- 1. Reconnect harness connectors disconnected.
- 2. Turn ignition switch ON.
- 3. Perform "VENT CONTROL/V" in "ACTIVE TEST" mode.
- Check air passage continuity and operation delay time. Check that new O-ring is installed properly.

Condition VENT CONTROL/V	Air passage continuity between (A) and (B)	
ON	Not existed	
OFF	Existed	

Operation takes less than 1 second.

Without CONSULT

- Disconnect EVAP canister vent control valve harness connector. 1.
- 2. Check air passage continuity and operation delay time under the
- following conditions. Check that new O-ring is installed properly.

Condition	Air passage continuity between (A) and (B)	
12 V direct current supply between terminals 1 and 2	Not existed	
OFF	Existed	
Operation takes less than 1 second.		
Is the inspection result normal?		
YES >> INSPECTION END		
NO >> GO TO 3.		
3.CHECK EVAP CANISTER V	ENT CONTROL VALVE-III	
	ion (A) to (B)] of EVAP canister vent	control valve using an air blower.

2. Perform "VENT CONTROL/V" in "ACTIVE TEST" mode.

< DTC/CIRCUIT DIAGNOSIS >

3. Check air passage continuity and operation delay time. Check that 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.

Without CONSULT

- 1. Clean the air passage [portion (A) to (B)] of EVAP canister vent control valve using an air blower.
- 2. Check air passage continuity and operation delay time under the following conditions.

Check that new O-ring is installed properly.

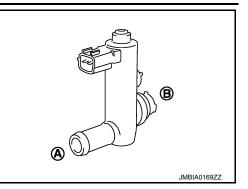
Condition	Air passage continuity between (A) and (B)	
12 V direct current supply between terminals (1) and (2)	No	
OFF	Yes	

Operation takes less than 1 second.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace EVAP canister vent control valve. Refer to <u>FL-17, "Exploded View"</u>.



[VQ35DE]

< DTC/CIRCUIT DIAGNOSIS >

P0451 EVAP CONTROL SYSTEM PRESSURE SENSOR

DTC Logic

INFOID:000000012406477

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DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0451	EVAP control system pressure sensor perfor- mance	ECM detects a sloshing signal from the EVAP control system pressure sensor	 Harness or connectors (EVAP control system pressure sensor circuit is shorted.) [CKP sensor (POS) circuit is shorted.] (APP sensor 2 circuit is shorted.) (Refrigerant pressure sensor circuit is shorted.) EVAP control system pressure sensor Crankshaft position sensor (POS) Accelerator pedal position sensor Refrigerant pressure sensor
DTC CON	FIRMATION PROCI	EDURE	
NOTE:	ove fuel filler can du	ring DTC confirmation procedure.	
4	NDITIONING		
before cond 1. Turn ig 2. Turn ig 3. Turn ig	ducting the next test. nition switch OFF and nition switch ON.	has been previously conducted, alwa wait at least 10 seconds. wait at least 10 seconds.	ays perform the following procedure
Without	CONSULT>>GO TO		
2.PERFOR	RM DTC CONFIRMAT	TION PROCEDURE-1	
NOTE: Do not 2. Check	ngine and let it idle for	r least 40 seconds. r pedal even slightly.	
		"Diagnosis Procedure".	
	• GO TO 3.		
_		TION PROCEDURE-2	
	"EVAP DIAG READY" Ile until "OFF" of "EVA	' in "DATA MONITOR" mode of "ENGINI P DIAG READY" changes to "ON".	Ε".
	nition switch OFF and	until "OFF" of "EVAP DIAG READY" wait at least 90 minutes.	changes to "ON".
 Turn ig Select Check Which is dis CMPLT>> 	nition switch ON. "EVAP LEAK DIAG" ir that "EVAP LEAK DIA splayed on CONSULT • GO TO 4.		

EC-331

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[VQ35DE]

P0451 EVAP CONTROL SYSTEM PRESSURE SENSOR
< DTC/CIRCUIT DIAGNOSIS >
4.PERFORM DTC CONFIRMATION PROCEDURE-3
With CONSULT Check 1st trip DTC. Is 1st trip DTC detected? YES >> Proceed to EC-332, "Diagnosis Procedure".
NO $>>$ INSPECTION END
5.PERFORM DTC CONFIRMATION PROCEDURE-4
 With GST Start engine and let it idle for least 40 seconds. NOTE: Do not depress accelerator pedal even slightly. Check 1st trip DTC. Is 1st trip DTC detected? YES >> Proceed to EC-332, "Diagnosis Procedure". NO >> GO TO 6. PERFORM DTC CONFIRMATION PROCEDURE-5
 With GST Let it idle for at least 2 hours. Turn ignition switch OFF and wait at least 90 minutes. NOTE: Never turn ignition switch ON during 90 minutes. Turn ignition switch ON. Check 1st trip DTC. Is 1st trip DTC detected? YES >> Proceed to EC-332, "Diagnosis Procedure". NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000012406478

$1. {\sf check evap control system pressure sensor connector for water}$

- 1. Disconnect EVAP control system pressure sensor harness connector.
- 2. Check that water is not inside connectors.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace harness connector.

2.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY

1. Turn ignition switch ON.

2. Check the voltage between EVAP control system pressure sensor harness connector and ground.

EVAP control system pressure sensor		Ground	Voltage (V)
Connector	Terminal	Ground	voltage (v)
B22	3	Ground	Approx. 5

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

${\bf 3.}$ CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.

- 2. Disconnect ECM harness connector.
- 3. Check the confinuity between EVAP control system pressure sensor harness connector and ECM harness connector.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

EVAP contro	ol system pressure sensor	E	CM	Continuito		А
Connect	or Terminal	Connector	Terminal	Continuity		
B22	3	E19	125	Existed		EC
YES >> NO >>	ection result normal? > Check intermittent ir > Repair short to grou	nd or short to p	ower in harness or			С
	EVAP CONTROL SY					
	AP control system pres	ssure sensor. F	Refer to <u>EC-333, "C</u>	Component Ins	pection".	D
YES >>	ection result normal? > Check intermittent ir > Replace EVAP cont				ploded View".	E
Compon	ent Inspection				INFOID:000000012406479	_
1. CHECK	EVAP CONTROL SY	STEM PRESS	URE SENSOR			F
2. Remov View". Alway	s replace O-ring witl	h a new one.			or. Refer to <u>FL-17, "Exploded</u>	G
	a vacuum pump to E\ Inition switch ON and				nder the following conditions.	Н
	ECM		Applied vacuum kPa			
Connector	+ Terminal	– Terminal	(kg/cm ² , psi)	Voltage		
	121	148	Not applied	1.8 - 4.8	V	
E19	(EVAP control system pressure sensor signal)	(Sensor ground)	-26.7 (-0.272, -3.87)	2.1 to 2.5 V low above val		J
• Neve	ays calibrate the vac				ver 101.3 kPa (1.033 kg/cm ² ,	К
	ection result normal?					L
	> INSPECTION END > Replace EVAP contr	rol system pres	sure sensor. Refer	to <u>FL-17, "Ex</u>	ploded View".	Μ
						Ν
						0
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< DTC/CIRCUIT DIAGNOSIS >

P0452 EVAP CONTROL SYSTEM PRESSURE SENSOR

DTC Logic

INFOID:000000012406480

[VQ35DE]

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0452	EVAP control system pressure sensor low in- put	An excessively low voltage from the sensor is sent to ECM.	 Harness or connectors (The sensor circuit is open or shorted.) [CKP sensor (POS) circuit is shorted.] (APP sensor 2 circuit is shorted.) (Refrigerant pressure sensor circuit is shorted.) EVAP control system pressure sensor Crankshaft position sensor (POS) Accelerator pedal position sensor Refrigerant pressure sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

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

TESTING CONDITION:

Always perform test at a temperature of 5°C (41°F) or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

(B) With CONSULT

- 1. Start engine and warm it up to normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Turn ignition switch ON.
- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Turn ignition switch ON.
- 6. Select "DATA MONITOR" mode with CONSULT.
- 7. Check that "FUEL T/TMP SE" is more than 0°C (32°F).
- 8. Start engine and wait at least 20 seconds.
- 9. Check 1st trip DTC.

With GST

- 1. Start engine and warm it up to normal operating temperature.
- 2. Set voltmeter probes to ECM harness connector terminals under the following conditions.

ECM				
Connector	+	-		
Connector	Terminal	Terminal		
E19	128 (Fuel tank temperature sensor signal)	148 (Sensor ground)		

- 3. Check that the voltage is less than 4.2 V.
- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Turn ignition switch ON.
- 6. Turn ignition switch OFF and wait at least 10 seconds.
- 7. Start engine and wait at least 20 seconds.
- 8. Check 1st trip DTC.
- Is 1st trip DTC detected?

Revision: October 2015

	T DIAGNOSIS >			Ľ	VQ35DE]
YES >> Pro	ceed to $EC-335$.		edure"	t	
	PECTION END	Diagnosis 1 100	<u>edure</u> .		A
Diagnosis Pr	ocedure			INFOIL	D:0000000012406481
1. СНЕСК СОМ	INECTOR				EC
	EVAP control sy water is not insid		ensor harness c	connector.	
Is the inspection	result normal?				С
YES >> GO					
· ·	air or replace ha			POWER SUPPLY	D
		STEM PRESSU	RE SENSOR P	OWER SUPPLY	
 Turn ignitior Check the v 		EVAP control sys	stem pressure s	sensor harness connector and grou	nd. E
EVAP control syste	em pressure sensor	Ground		-	
Connector	Terminal	Ground	Voltage (V)		F
B22	3	Ground	Approx. 5	_	
Is the inspection					G
YES >> GO NO >> GO					
•		STEM PRESSU	RE SENSOR P	POWER SUPPLY CIRCUIT	Н
-	n switch OFF.				
2. Disconnect	ECM harness co				
3. Check the oness conner		en EVAP contro	l system pressu	are sensor harness connector and	ECM har-
EVAP control syste	em pressure sensor	EC	CM	Continuity	J
Connector	Terminal	Connector	Terminal	-	
B22	3	E19	125	Existed	
Is the inspection		aident Defente			K
	air open circuit.	icident. Refer to		topt Incident"	K
NO Rep	an open circuit.		<u>GI-41, Internit</u>	tent Incident".	K
4	-	STEM PRESSU		<u>tent Incident"</u> . GROUND CIRCUIT FOR OPEN AN	L
4.CHECK EVA	-	STEM PRESSU			L
4.CHECK EVA 1. Turn ignition 2. Disconnect	P CONTROL SY n switch OFF. ECM harness co	nnector.	IRE SENSOR G	GROUND CIRCUIT FOR OPEN AN	D SHORT
4.CHECK EVA 1. Turn ignition 2. Disconnect	P CONTROL SY n switch OFF. ECM harness co continuity betwee	nnector.	IRE SENSOR G		D SHORT
4.CHECK EVA 1. Turn ignition 2. Disconnect 3. Check the o	P CONTROL SY n switch OFF. ECM harness co continuity betwee	nnector.	IRE SENSOR G	GROUND CIRCUIT FOR OPEN AN	D SHORT
 CHECK EVA Turn ignition Disconnect Check the oness connect 	P CONTROL SY n switch OFF. ECM harness co continuity betwee	nnector.	IRE SENSOR G	GROUND CIRCUIT FOR OPEN AN	D SHORT ECM har-
 4.CHECK EVA 1. Turn ignition 2. Disconnect 3. Check the oness connect EVAP control system Connector 	P CONTROL SY n switch OFF. ECM harness co continuity betwee ctor. em pressure sensor Terminal	onnector. en EVAP contro EC Connector	IRE SENSOR G I system pressu CM Terminal	BROUND CIRCUIT FOR OPEN AN	D SHORT ECM har-
 4.CHECK EVA 1. Turn ignition 2. Disconnect 3. Check the oness connect EVAP control system Connector B22 	P CONTROL SY n switch OFF. ECM harness co continuity betwee ctor. em pressure sensor Terminal 1	onnector. en EVAP contro EC Connector E19	IRE SENSOR G	GROUND CIRCUIT FOR OPEN AN	D SHORT ECM har-
 4.CHECK EVA 1. Turn ignition 2. Disconnect 3. Check the oness connect EVAP control system Connector B22 4. Also check 	P CONTROL SY n switch OFF. ECM harness co continuity betwee ctor. em pressure sensor Terminal 1 harness for shor	onnector. en EVAP contro EC Connector E19	IRE SENSOR G	BROUND CIRCUIT FOR OPEN AN	D SHORT ECM har-
 4.CHECK EVA 1. Turn ignition 2. Disconnect 3. Check the oness connect EVAP control system Connector B22 4. Also check Is the inspection 	P CONTROL SY a switch OFF. ECM harness co continuity betwee ctor. em pressure sensor Terminal 1 harness for short result normal?	onnector. en EVAP contro EC Connector E19	IRE SENSOR G	BROUND CIRCUIT FOR OPEN AN	D SHORT ECM har-
 4.CHECK EVA 1. Turn ignition 2. Disconnect 3. Check the orness connect EVAP control system Connector B22 4. Also check Is the inspection YES >> GO 	P CONTROL SY a switch OFF. ECM harness co continuity betwee ctor. em pressure sensor Terminal 1 harness for short result normal? TO 5.	EC EC Connector E19 to ground and s	IRE SENSOR G	BROUND CIRCUIT FOR OPEN AN	D SHORT M ECM har- N
 4.CHECK EVA 1. Turn ignition 2. Disconnect 3. Check the orness connect EVAP control system Connector B22 4. Also check Is the inspection YES >> GO NO >> Rep 	P CONTROL SY a switch OFF. ECM harness co continuity betwee ctor. m pressure sensor Terminal 1 harness for short result normal? TO 5. pair open circuit,	ECCONNECTOR CONNECTOR E19 to ground and s	IRE SENSOR G	BROUND CIRCUIT FOR OPEN AN ure sensor harness connector and Continuity Existed	D SHORT ECM har- N O P
 4.CHECK EVA 1. Turn ignition 2. Disconnect 3. Check the orness connect EVAP control system Connector B22 4. Also check Is the inspection YES >> GO NO >> Rep 	P CONTROL SY a switch OFF. ECM harness co continuity betwee ctor. m pressure sensor Terminal 1 harness for short result normal? TO 5. pair open circuit,	ECCONNECTOR CONNECTOR E19 to ground and s	IRE SENSOR G	BROUND CIRCUIT FOR OPEN AN ure sensor harness connector and Continuity Existed	D SHORT ECM har- N O P

< DTC/CIRCUIT DIAGNOSIS >

EVAP control syste	em pressure sensor	E	CM	Continuity
Connector Terminal		Connector	Terminal	Continuity
B22	2	E19	121	Existed

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

Is the inspection result normal?

YES >> GO TO 6.

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

6.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Check EVAP control system pressure sensor. Refer to <u>EC-336. "Component Inspection"</u>. <u>Is the inspection result normal?</u>

- YES >> Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u>.
- NO >> Replace EVAP control system pressure sensor. Refer to FL-17, "Exploded View".

Component Inspection

INFOID:000000012406482

1.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

1. Turn ignition switch OFF.

2. Remove EVAP control system pressure sensor with its harness connector. Refer to <u>FL-17, "Exploded</u> <u>View"</u>.

Always replace O-ring with a new one.

- 3. Install a vacuum pump to EVAP control system pressure sensor.
- 4. Turn ignition switch ON and check output voltage between ECM terminals under the following conditions.

	ECM		Applied ve even kDe		
Connector	+ –		Applied vacuum kPa (kg/cm ² , psi)	Voltage	
Connector	Terminal	Terminal			
	121	148	Not applied	1.8 - 4.8 V	
E19	(EVAP control system pressure sensor signal)	(Sensor ground)	-26.7 (-0.272, -3.87)	2.1 to 2.5 V lower than above value	

CAUTION:

- Always calibrate the vacuum pump gauge when using it.
- Never apply below -93.3 kPa (-0.952 kg/cm², -13.53 psi) or pressure over 101.3 kPa (1.033 kg/cm², 14.69 psi).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace EVAP control system pressure sensor. Refer to <u>FL-17, "Exploded View"</u>.

< DTC/CIRCUIT DIAGNOSIS >

P0453 EVAP CONTROL SYSTEM PRESSURE SENSOR

DTC Logic

INFOID:000000012406483

[VQ35DE]

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0453	EVAP control system pressure sensor high in- put	An excessively high voltage from the sensor is sent to ECM.	 Harness or connectors (The sensor circuit is open or shorted.) [CKP sensor (POS) circuit is shorted.] (APP sensor 2 circuit is shorted.) (Refrigerant pressure sensor circuit is shorted.) EVAP control system pressure sensor Crankshaft position sensor (POS) Accelerator pedal position sensor Refrigerant pressure sensor EVAP canister vent control valve EVAP canister Rubber hose from EVAP canister vent control valve to vehicle frame

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following before conduct- H ing the next test.

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

3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Always	perform	test at a	tem	perature	of 5°C	(41°F) or more.
/				poracaro			,

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT 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.
- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Turn ignition switch ON.
- 6. Select "DATA MONITOR" mode with CONSULT.
- 7. Check that "FUEL T/TMP SE" is more than 0°C (32°F).
- 8. Start engine and wait at least 20 seconds.
- 9. Check 1st trip DTC.

With GST

- 1. Start engine and warm it up to normal operating temperature.
- 2. Set voltmeter probes to ECM harness connector terminals.

ECM				
Connector	+	-		
Connector	Terminal	Terminal		
E19	128 (Fuel tank temperature sensor signal)	148 (Sensor ground)		

- 3. Check that the voltage is less than 4.2 V.
- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Turn ignition switch ON.

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< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

INFOID:000000012406484

- 6. Turn ignition switch OFF and wait at least 10 seconds.
- 7. Start engine and wait at least 20 seconds.

8. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to <u>EC-338, "Diagnosis Procedure"</u>.

NO >> INSPECTION END

Diagnosis Procedure

1.CHECK CONNECTOR

1. Disconnect EVAP control system pressure sensor harness connector.

2. Check that water is not inside connectors.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace harness connector.

2.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY

1. Turn ignition switch ON.

2. Check the voltage between EVAP control system pressure sensor harness connector and ground.

EVAP control syste	em pressure sensor	Ground	Voltage (V)	
Connector	Connector Terminal		voltage (v)	
B22	3	Ground	Approx. 5	

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.

- 2. Disconnect ECM harness connector.
- Check the continuity between EVAP control system pressure sensor harness connector and ECM harness connector.

EVAP control syste	em pressure sensor	E	Continuity		
Connector Terminal		Connector	Terminal	Continuity	
B22	3	E19	125	Existed	

Is the inspection result normal?

YES >> Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u>.

NO >> Repair open circuit.

4.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check the continuity between EVAP control system pressure sensor harness connector and ECM harness connector.

EVAP control syste	em pressure sensor	E	Continuity	
Connector Terminal		Connector	Terminal	Continuity
B22	1	E19	148	Existed

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

Is the inspection result normal?

YES >> GO TO 5.

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

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE] 5.check evap control system pressure sensor input signal circuit for open and А SHORT 1. Check the continuity between EVAP control system pressure sensor harness connector and ECM harness connector. EC EVAP control system pressure sensor ECM Continuity Connector Terminal Connector Terminal 2 B22 E19 121 Existed 2. Also check harness for short to ground and short to power. D Is the inspection result normal? YES >> GO TO 6. NO >> Repair open circuit, short to ground or short to power in harness or connectors. Е 6.CHECK RUBBER TUBE 1. Disconnect rubber tube connected to EVAP canister vent control valve. Check the rubber tube for clogging. 2. Is the inspection result normal? YES >> GO TO 7. NO >> Clean the rubber tube using an air blower, repair or replace rubber tube. I.CHECK EVAP CANISTER VENT CONTROL VALVE Check EVAP canister vent control valve. Refer to EC-325, "Component Inspection". Н Is the inspection result normal? YES >> GO TO 8. NO >> Replace EVAP canister vent control valve. Refer to FL-17, "Exploded View". ${\sf f O}.$ CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR Check EVAP control system pressure sensor. Refer to EC-340, "Component Inspection". Is the inspection result normal? YES >> GO TO 9. NO >> Replace EVAP control system pressure sensor. Refer to FL-17, "Exploded View". Κ 9.CHECK IF EVAP CANISTER IS SATURATED WITH WATER 1. Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached. Refer to FL-17, "Exploded View". L Check if water will drain from the EVAP canister. 2. Does water drain from the EVAP canister? YES >> GO TO 10. M EVAP canister >> Check intermittent incident. Refer to GI-41, "Intermittent NO Incident". Ν Water VAP canister vent control valve JMBIA1134GB

10.CHECK EVAP CANISTER

P Weigh the EVAP canister with the EVAP canister vent control valve and EVAP control system pressure sensor attached.

The weight should be less than 2.1 kg (4.6 lb).

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".

NO >> GO TO 11.

11. DETECT MALFUNCTIONING PART

< DTC/CIRCUIT DIAGNOSIS >

Check the following.

- EVAP canister for damage
- EVAP hose between EVAP canister and vehicle frame for clogging or poor connection

>> Repair hose or replace EVAP canister. Refer to FL-17, "Exploded View".

Component Inspection

INFOID:000000012406485

[VQ35DE]

1.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

1. Turn ignition switch OFF.

2. Remove EVAP control system pressure sensor with its harness connector. Refer to <u>FL-17</u>, "<u>Exploded</u> <u>View</u>".

Always replace O-ring with a new one.

- 3. Install a vacuum pump to EVAP control system pressure sensor.
- 4. Turn ignition switch ON and check output voltage between ECM terminals under the following conditions.

	ECM				
Connector	+	_	Applied vacuum kPa (kg/cm ² , psi)	Voltage	
Connector	Terminal	Terminal	(
	121	148	Not applied	1.8 - 4.8 V	
E19	(EVAP control system pressure sensor signal)	(Sensor ground)	-26.7 (-0.272, -3.87)	2.1 to 2.5 V lower than above value	

CAUTION:

• Always calibrate the vacuum pump gauge when using it.

Never apply below -93.3 kPa (-0.952 kg/cm², -13.53 psi) or pressure over 101.3 kPa (1.033 kg/cm², 14.69 psi).

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Replace EVAP control system pressure sensor. Refer to FL-17, "Exploded View".

< DTC/CIRCUIT DIAGNOSIS >

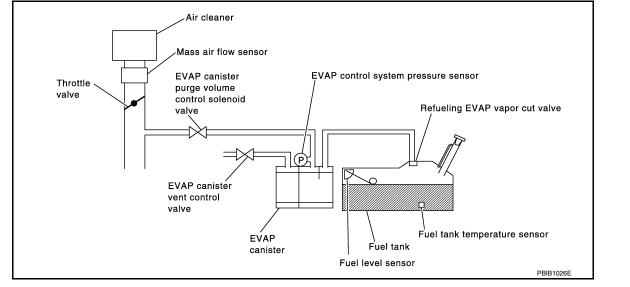
P0456 EVAP CONTROL SYSTEM

DTC Logic

DTC DETECTION LOGIC

This diagnosis detects leaks in the EVAP line between fuel tank and EVAP canister purge volume control solenoid valve, using the negative pressure caused by decrease of fuel temperature in the fuel tank after turning ignition switch OFF.

If ECM judges there are no leaks, the diagnosis will be OK.



DTC No.	Trouble diagnosis name (Trouble diagnosis content)	DTC detecting condition	Possible cause
P0456	Evaporative emission control system leak	 EVAP system has a leak. EVAP system does not operate properly. 	 Incorrect fuel tank vacuum relief valve Incorrect fuel filler cap used Fuel filler cap remains open or does not close. Foreign matter caught in fuel filler cap. Leakage is in line between intake manifold and EVAP canister purge volume control solenoid valve. Foreign matter caught in EVAP canister vent con- trol valve. EVAP canister or fuel tank leakage EVAP purge line (pipe and rubber tube) leakage EVAP purge line rubber tube bent Loose or disconnected rubber tube EVAP canister purge volume control solenoid valve and the circuit Fuel tank temperature sensor O-ring of EVAP canister is saturated with water EVAP control system pressure sensor Refueling EVAP vapor cut valve ORVR system leakage Fuel level sensor and the circuit Foreign matter caught in EVAP canister purge volume control valve is mosting or damaged

CAUTION:

• Use only a genuine NISSAN fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the MIL may illuminate.

• If the fuel filler cap is not tightened properly, the MIL may illuminate.

• Use only a genuine NISSAN rubber tube as a replacement.

INFOID:000000012406486

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< DTC/CIRCUIT DIAGNOSIS >

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

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

Do you have CONSULT?

YES >> GO TO 2.

NO >> GO TO 4.

2.PERFORM DTC CONFIRMATION PROCEDURE-I

WITH CONSULT

- 1. Turn ignition switch ON and select "EVAP DIAG READY" in "DATA MONITOR" mode with CONSULT.
- 2. Start engine and wait at idle until "OFF" of "EVAP DIAG READY" changes to "ON". **NOTE:**
 - It will take at most 2 hours until "OFF" of "EVAP DIAG READY" changes to "ON".
- 3. Turn ignition switch OFF and wait at least 90 minutes. **NOTE:**

Never turn ignition switch ON during 90 minutes.

- 4. Turn ignition switch ON and select "EVAP LEAK DIAG" in "DATA MONITOR" mode with CONSULT.
- 5. Check that "EVAP LEAK DIAG" indication.

Which is displayed on CONSULT?

CMPLT >> GO TO 3.

YET >> Perform DTC CONFIRMATION PROCEDURE again. GO TO 1.

3.PERFORM DTC CONFIRMATION PROCEDURE-II

Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to EC-342, "Diagnosis Procedure".

NO >> INSPECTION END.

4.PERFORM DTC CONFIRMATION PROCEDURE

WITH GST

- 1. Start engine and wait engine idle for at least 2 hours.
- 2. Turn ignition switch OFF and wait at least 90 minutes. **NOTE:**

Never turn ignition switch ON during 90 minutes.

- 3. Turn ignition switch ON.
- 4. Check 1st trip DTC.
- Is 1st trip DTC detected?
- YES >> Proceed to EC-342, "Diagnosis Procedure".
- NO >> INSPECTION END.

Diagnosis Procedure

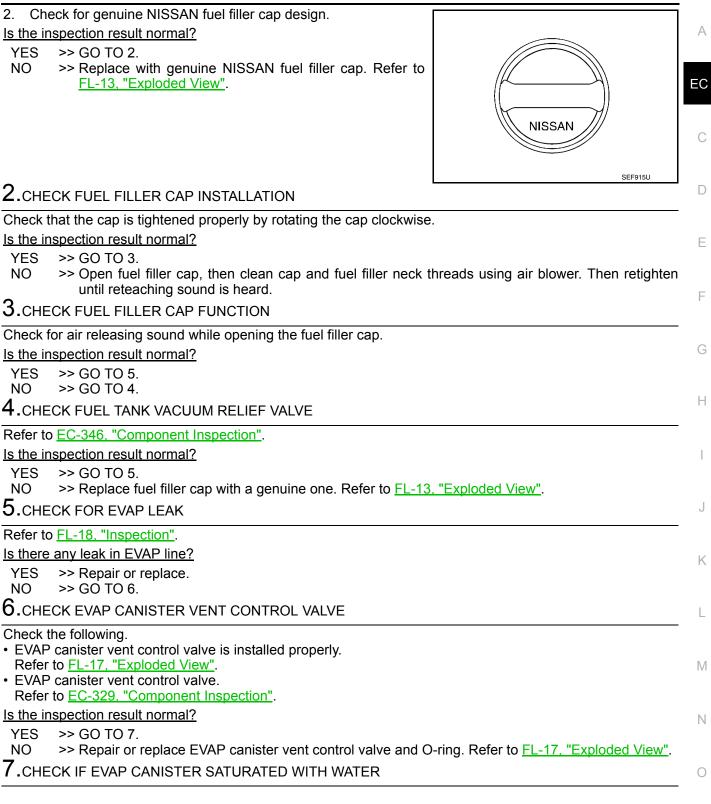
INFOID:000000012406487

1.CHECK FUEL FILLER CAP DESIGN

1. Turn ignition switch OFF.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

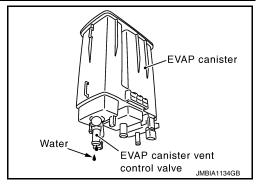


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< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

- 1. 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. 2.
- Does water drain from EVAP canister?
- YES >> GO TO 8.
- NO-1 >> With CONSULT: GO TO 10.
- NO-2 >> Without CONSULT: GO TO 11.



8. CHECK EVAP CANISTER

Weigh the EVAP canister assembly with the EVAP canister vent control valve and EVAP control system pressure sensor attached. Refer to FL-17, "Exploded View". The weight should be less than 2.1 kg (4.6 lb).

Is the inspection result normal?

YES-1 >> With CONSULT: GO TO 10. YES-2 >> Without CONSULT: GO TO 11. NO >> GO TO 9.

9. DETECT MALFUNCTIONING PART

Check the following.

- EVAP canister for damage
- EVAP hose between EVAP canister and vehicle frame for clogging or poor connection

>> Repair hose or replace EVAP canister. Refer to FL-16, "Hydraulic Layout".

10. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

(P)WITH CONSULT

- 1. Disconnect vacuum hose to EVAP canister purge volume control solenoid valve at EVAP service port.
- 2. Start engine and let it idle.
- 3. Select "PURG VOL CONT/V" in "ACTIVE TEST" mode.
- 4. Touch "Qu" on CONSULT screen to increase "PURG VOL CONT/V" opening to 100%.
- Check vacuum hose for vacuum.

Vacuum should exist.

Is the inspection result normal?

YES >> GO TO 13. NO

>> GO TO 12.

11. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

WITHOUT CONSULT

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. 3.
- 4. Start engine and let it idle for at least 80 seconds.
- 5. Check vacuum hose for vacuum when revving engine up to 2,000 rpm.

Vacuum should exist.

Is the inspection result normal?

YES >> GO TO 13. NO >> GO TO 12. 12.CHECK VACUUM HOSE

Check vacuum hoses for clogging or disconnection. Refer to FL-16, "Hydraulic Layout". Is the inspection result normal?

P0456 EVAP CONTROL SYSTEM	
< DTC/CIRCUIT DIAGNOSIS >	[VQ35DE]
YES >> GO TO 13. NO >> Repair or reconnect the hose.	A
13. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE	
Refer to EC-321, "Component Inspection".	EC
Is the inspection result normal?	
YES >> GO TO 14. NO >> Replace EVAP canister purge volume control solenoid valve. Refer to <u>EM-29</u> , "Exp	loded View".
14.CHECK FUEL TANK TEMPERATURE SENSOR	C
Refer to EC-278, "Component Inspection".	D
Is the inspection result normal? YES >> GO TO 15.	D
NO >> Replace fuel level sensor unit. Refer to <u>FL-6, "Removal and Installation"</u> .	
15. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR	E
Refer to EC-333, "Component Inspection".	
Is the inspection result normal?	F
YES >> GO TO 16.	
NO >> Replace EVAP control system pressure sensor. Refer to <u>FL-17, "Exploded View"</u> .	
16.CHECK EVAP PURGE LINE	G
Check EVAP purge line (pipe, rubber tube, fuel tank and EVAP canister) for cracks or improper Refer to <u>FL-16</u> , " <u>Hydraulic Layout</u> ".	connection.
Is the inspection result normal?	Н
YES >> GO TO 17.	
NO >> Repair or reconnect the hose.	
17.CLEAN EVAP PURGE LINE	
Clean EVAP purge line (pipe and rubber tube) using air blower.	
>> GO TO 18.	J
18. CHECK EVAP/ORVR LINE	
	k impropor oop
Check EVAP/ORVR line between EVAP canister and fuel tank for clogging, kink, looseness and nection. For location, refer to <u>FL-16, "Hydraulic Layout"</u> .	
Is the inspection result normal?	L
YES >> GO TO 19.	
NO >> Repair or replace hoses and tubes. 19.CHECK RECIRCULATION LINE	
	N
Check recirculation line between fuel filler tube and fuel tank for clogging, kink, cracks, improper connection.	looseness and
Is the inspection result normal?	Ν
YES >> GO TO 20.	
NO >> Repair or replace hose, tube or fuel filler tube. Refer to <u>FL-13, "Exploded View"</u> .	C
20. CHECK REFUELING EVAP VAPOR CUT VALVE	
Refer to EC-493, "Component Inspection".	
Is the inspection result normal?	F
YES >> GO TO 21. NO >> Replace refueling EVAP vapor cut valve with fuel tank. Refer to <u>FL-13, "Exploded V</u>	View".
21. CHECK FUEL LEVEL SENSOR	
Refer to <u>MWI-83, "Component Inspection"</u> .	
Is the inspection result normal?	

YES >> GO TO 22.

< DTC/CIRCUIT DIAGNOSIS >

NO >> Replace fuel level sensor unit. Refer to <u>FL-6</u>, "Removal and Installation".

22.CHECK INTERMITTENT INCIDENT

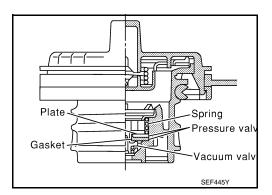
Refer to GI-41, "Intermittent Incident".

>> INSPECTION END

Component Inspection

1.CHECK FUEL FILLER CAP

- 1. Turn ignition switch OFF.
- 2. Remove fuel filler cap. Refer to FL-13, "Exploded View".
- 3. Wipe clean valve housing.



Vacuum/Pressure gauge

One-way valve

Fuel filler

Fuel filler cap adapter

cap

ī

- 4. Install fuel filler cap adapter (commercial service tool) to fuel filler cap.
- 5. Check valve opening pressure and vacuum.

Pressure: 15.3 - 20.0 kPa (0.156 - 0.204 kg/cm², 2.22 - 2.90 psi) Vacuum: 6.0 to 3.3 kPa (0.061 to 0.034 kg/cm²

Vacuum: -6.0 to -3.3 kPa (-0.061 to -0.034 kg/cm², -0.87 to -0.48 psi)

Is the inspection result normal?

YES >> INSPECTION END NO >> GO TO 2.

2.REPLACE FUEL FILLER CAP

Replace fuel filler cap. Refer to <u>FL-13, "Exploded View"</u>.

CAUTION:

Use only a genuine fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the MIL may illuminate.

>> INSPECTION END



[VQ35DE]

INFOID:000000012406488

Vacuum/

Pressure pump

SEF9435

P0460 FUEL LEVEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P0460 FUEL LEVEL SENSOR

DTC Logic

DTC DETECTION LOGIC

NOTE:

- If DTC P0460 is displayed with DTC UXXXX, first perform the trouble diagnosis for DTC UXXXX.
- If DTC P0460 is displayed with DTC P0607, first perform the trouble diagnosis for DTC P0607. Refer to <u>EC-376, "DTC Logic"</u>.

When the vehicle is parked, the fuel level in the fuel tank is naturally stable. It means that output signal of the fuel level sensor does not change. If ECM senses sloshing signal from the sensor, fuel level sensor malfunction is detected.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	
P0460	Fuel level sensor circuit noise	Even though the vehicle is parked, a signal be- ing 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 	F

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

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

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1.	Start engine and wait maximum of 2 consecutive minutes.
2.	Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to EC-347, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1.CHECK COMBINATION METER FUNCTION

Check combination meter function. Refer to <u>MWI-36, "CONSULT Function"</u>. Is the inspection result normal?

YES >> Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u>.

NO >> Proceed to <u>MWI-82, "Diagnosis Procedure"</u>.

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P0461 FUEL LEVEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P0461 FUEL LEVEL SENSOR

DTC Logic

DTC DETECTION LOGIC

NOTE:

- If DTC P0461 is displayed with DTC UXXXX, first perform the trouble diagnosis for DTC UXXXX.
- If DTC P0461 is displayed with DTC P0607, first perform the trouble diagnosis for DTC P0607. Refer to <u>EC-376, "DTC Logic"</u>.

Driving long distances naturally affect fuel gauge level.

This diagnosis detects the fuel gauge malfunction of the gauge not moving even after a long distance has been driven.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0461	Fuel level sensor circuit range/performance	The output signal of the fuel level sensor does not change within the specified range even though the vehicle has been driven a long dis- tance.	 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

1.PERFORM COMPONENT FUNCTION CHECK

Perform component function check. Refer to EC-348, "Component Function Check".

Use component function check to check the overall function of the fuel level sensor. During this check, a 1st trip DTC might not be confirmed.

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Proceed to EC-349, "Diagnosis Procedure".

Component Function Check

INFOID:000000012406492

1.PRECONDITIONING

WARNING:

When performing the following procedure, always observe the handling of the fuel. Refer to <u>FL-6</u>, <u>"Exploded View"</u>.

TESTING CONDITION:

Before starting component function check, preparation of draining fuel and refilling fuel is required.

Will CONSULT be used?

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

2. PERFORM COMPONENT FUNCTION CHECK

With CONSULT NOTE:

Start from step 10, if it is possible to confirm that the fuel cannot be drained by 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal) in advance.

- 1. Prepare a fuel container and a spare hose.
- 2. Release fuel pressure from fuel line, refer to EC-510, "Work Procedure".
- 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.
- 7. Check "FUEL LEVEL SE" output voltage and note it.
- 8. Select "FUEL PUMP RELAY" in "ACTIVE TEST" mode with CONSULT.

INFOID:000000012406491

P0461 FUEL LEVEL SENSOR

11. Fill fuel into the fuel tank for 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal). 12. Check "FUEL LEVEL SE" output voltage and note it. 13. Confirm whether the voltage changes more than 0.03 V during step 7 to 10 and 10 to 12. Is the inspection result normal? YES >> INSPECTION END NO >> Proceed to EC-349. "Diagnosis Procedure". QWithout CONSULT E Work of the inspection result normal? YES >> If it is possible to confirm that the fuel cannot be drained by 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal) in advance. 1. Prepare a fuel container and a spare hose. E 2. Release fuel pressure from fuel line. Refer to EC-510. "Work Procedure". E 3. Remove the fuel feed hose on the fuel level sensor unit. Refer to EL-6. "Exploded View". E 4. Connect a spare fuel hose where the fuel feed hose was removed. F 5. Turn ignition switch ON. F 6. Drain fuel by 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal). E 7. Confirm that the fuel gauge indication varies. E 8. Fill fuel into the fuel auge indication varies. E 9. Confirm that the fuel gauge indication varies. E 9. Ocheck intermittent for 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal). C 9. Confirm that the fuel gauge indication varies. E	< DTC/CIRCUIT DIAGNOSIS >	[VQ35DE]	
Is the inspection result normal? YES >> INSPECTION END NO >> Proceed to EC.349. "Diagnosis Procedure". 3. PERFORM COMPONENT FUNCTION CHECK Without CONSULT NOTE: Start from step 8, if it is possible to confirm that the fuel cannot be drained by 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal) in advance. 1. Prepare a fuel container and a spare hose. 2. Release fuel pressure from fuel line. Refer to EC.510. "Work Procedure". 3. Remove the fuel feed hose on the fuel level sensor unit. Refer to EL-6. "Exploded View". 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. 15 the inspection result normal? YES >> INSPECTION END NO >> Proceed to EC.349. "Diagnosis Procedure". Diagnosis Proced to EL-349. "Diagnosis Procedure". NO >> Proceed to EL-349. "Diagnosis Procedure". NO >> Proceed to EMINATION METER FUNCTION Check intermittent incident. Refer to GL41. "Intermittent Incident". NO >> Proceed to MWI-32. "Diagnosis Procedure". NO >> Proceed to MWI-32. "Diagnosis Proc	 Check "FUEL LEVEL SE" output voltage and note it. Fill fuel into the fuel tank for 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal). Check "FUEL LEVEL SE" output voltage and note it. 		A
Without CONSULT Image: Construct the second sec	YES >> INSPECTION END		С
NOTE: L Start from step 8, if it is possible to confirm that the fuel cannot be drained by 30 l (7-7/8 US gal, 6-5/8 Imp gal) in advance. E 1. Prepare a fuel container and a spare hose. E 2. Release fuel pressure from fuel line. Refer to EC-510. "Work Procedure". E 3. Remove the fuel feed hose on the fuel level sensor unit. Refer to EL-6, "Exploded View". E 4. Connect a spare fuel hose where the fuel feed hose was removed. F 5. Turn ignition switch ON. E 6. Drain fuel by 30 l (7-7/8 US gal, 6-5/8 Imp gal) from the fuel tank using proper equipment. 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). G 9. Confirm that the fuel gauge indication varies. E 18 the inspection result normal? F YES >> INSPECTION END F NO >> Proceed to EC-349. "Diagnosis Procedure". F Diagnosis Procedure Image: Consumment of Consumment	3.PERFORM COMPONENT FUNCTION CHECK		
 4. Connect a spare fuel hose where the fuel feed hose was removed. 5. Turn ignition switch ON. 6. Drain fuel by 30 <i>l</i> (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 ank for 30 <i>l</i> (7-7/8 US gal, 6-5/8 Imp gal). 9. Confirm that the fuel gauge indication varies. 18 the inspection result normal? YES >> INSPECTION END NO >> Proceed to EC-349. "Diagnosis Procedure". Diagnosis Procedure 1. CHECK COMBINATION METER FUNCTION Check combination meter function. Refer to GI-41. "Intermittent Incident". NO >> Proceed to MWI-82. "Diagnosis Procedure". Is the inspection result normal? YES >> Check intermittent incident. Refer to GI-41. "Intermittent Incident". NO >> Proceed to MWI-82. "Diagnosis Procedure". 	 NOTE: Start from step 8, if it is possible to confirm that the fuel cannot be drained by 30 ℓ (7-7/8 Imp gal) in advance. 1. Prepare a fuel container and a spare hose. 2. Release fuel pressure from fuel line. Refer to EC-510. "Work Procedure". 	3 US gal, 6-5/8	D
8. Fill fuel into the fuel tank for 30 l (7-7/8 US gal, 6-5/8 Imp gal). 9. Confirm that the fuel gauge indication varies. Is the inspection result normal? YES >> INSPECTION END NO >> Proceed to EC-349, "Diagnosis Procedure". Diagnosis Procedure 1.CHECK COMBINATION METER FUNCTION Check combination meter function. Refer to MWI-36, "CONSULT Function". Is the inspection result normal? YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident". NO >> Proceed to MWI-82, "Diagnosis Procedure".	 Connect a spare fuel hose where the fuel feed hose was removed. Turn ignition switch ON. Drain fuel by 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal) from the fuel tank using proper equipment. 		F
NO >> Proceed to EC-349. "Diagnosis Procedure". Diagnosis Procedure	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. <u>Is the inspection result normal?</u>		G
1.CHECK COMBINATION METER FUNCTION Check combination meter function. Refer to MWI-36, "CONSULT Function". Is the inspection result normal? YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident". NO >> Proceed to MWI-82, "Diagnosis Procedure". NO >> Proceed to MWI-82, "Diagnosis Procedure".			11
Check combination meter function. Refer to MWI-36, "CONSULT Function". Is the inspection result normal? YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident". NO >> Proceed to MWI-82, "Diagnosis Procedure". K		INFOID:000000012406493	
Is the inspection result normal? YES >> Check intermittent incident. Refer to <u>GI-41. "Intermittent Incident"</u> . NO >> Proceed to <u>MWI-82. "Diagnosis Procedure"</u> . K			
YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident". NO >> Proceed to MWI-82, "Diagnosis Procedure". IL NO			J
N	YES >> Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u> .		K
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< DTC/CIRCUIT DIAGNOSIS >

P0462, P0463 FUEL LEVEL SENSOR

DTC Logic

INFOID:000000012406494

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DTC DETECTION LOGIC

NOTE:

- If DTC P0462 or P0463 is displayed with DTC UXXXX, first perform the trouble diagnosis for DTC UXXXX.
- If DTC P0462 or P0463 is displayed with DTC P0607, first perform the trouble diagnosis for DTC P0607.Refer to <u>EC-376, "DTC Logic"</u>.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0462	Fuel level sensor circuit low input	An excessively low voltage from the sensor is sent to ECM.	Harness or connectors (The CAN communication line is open or
P0463	Fuel level sensor circuit high input	An excessively high voltage from the sensor is sent to ECM.	 shorted) Harness or connectors (The sensor circuit is open or shorted) Combination meter Fuel level sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

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

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 11 V at ignition switch ON.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Turn ignition switch ON and wait at least 5 seconds.
- 2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to EC-350, "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

1.CHECK COMBINATION METER FUNCTION

Check combination meter function. Refer to MWI-36, "CONSULT Function".

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
- NO >> Proceed to <u>MWI-82, "Diagnosis Procedure"</u>.

INFOID:000000012406495

< DTC/CIRCUIT DIAGNOSIS >

P0500 VSS

Description

ECM receives vehicle speed signals from two different paths via CAN communication line: One is from the EC ABS actuator and electric unit (control unit) via the combination unit and the other is from TCM.

DTC Logic

INFOID-000000012406497

INFOID:000000012406496

DTC DETECTION LOGIC

NOTE:

- If DTC P0500 is displayed with DTC UXXXX, first perform the trouble diagnosis for DTC UXXXX.
- If DTC P0500 is displayed with DTC P0607, first perform the trouble diagnosis for DTC P0607. Refer to EC-376, "DTC Logic".

DTC No.	Trouble diagnosis (Trouble diagnosis content)	DTC detecting condition	Possible cause
P0500	VEH SPEED SEN/CIRC (Vehicle speed sensor)	At 20 km/h (13 MPH), ECM detects the fol- lowing status continuously for 5 seconds or more: The difference between a vehicle speed calculated by a secondary speed sen- sor transmitted from TCM to ECM via CAN communication and the vehicle speed indi- cated on the combination meter exceeds 15km/h (10 MPH).	 Harness or connector (The CAN communication line is open or shorted.) Combination meter ABS actuator and electric unit (control unit) Wheel sensor TCM Secondary speed sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

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

2. Turn ignition switch ON.

Turn ignition switch OFF and wait at least 10 seconds. 3.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is 10 V or more at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine. Shift the selector lever to D range and wait at least for 2 seconds. M 3. Drive the vehicle at least 5 seconds at 20 km/h (13 MPH) or more. **CAUTION:** Always drive vehicle at a safe speed. Ν

NOTE:

This procedure may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to EC-351, "Diagnosis Procedure"

NO >> INSPECTION END

Diagnosis Procedure

CHECK DTC WITH TCM

Check DTC with TCM. Refer to TM-42, "CONSULT Function".

Is the inspection result normal?

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P0500 VSS

< DTC/CIRCUIT DIAGNOSIS >

NO >> Perform trouble shooting relevant to DTC indicated.

 $2. {\sf CHECK} \ {\sf DTC} \ {\sf with} \ {\sf ABS} \ {\sf aCTUATOR} \ {\sf AND} \ {\sf ELECTRIC} \ {\sf UNIT} \ ({\sf CONTROL} \ {\sf UNIT})$

Check DTC with ABS actuator and electric unit (control unit). Refer to BRC-30, "CONSULT Function".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Perform trouble shooting relevant to DTC indicated.

3.CHECK DTC WITH COMBINATION METER

Check DTC with combination meter. Refer to <u>MWI-36, "CONSULT Function"</u>.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Perform trouble shooting relevant to DTC indicated.

4.CHECK SECONDARY SPEED SENSOR

Check secondary speed sensor. Refer to TM-159, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace or replace error-detected parts.

5.CHECK WHEEL SENSOR

Check wheel sensor. Refer to BRC-71, "Diagnosis Procedure".

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u>.
- NO >> Replace or replace error-detected parts.

P0506 ISC SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

P0506 ISC SYSTEM

Description

The ECM controls the engine idle speed to a specified level through the fine adjustment of the air, which is let into the intake manifold, by operating the electric throttle control actuator. The operating of the throttle valve is varied to allow for optimum control of the engine idling speed. The crankshaft position sensor (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.).

DTC Logic

INFOID:000000012406500

DTC DETECTION LOGIC

NOTE:

If DTC P0506 is displayed with other DTC, first perform the trouble diagnosis for the other DTC.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0506	Idle speed control sys- tem RPM lower than ex- pected	The idle speed is less than the target idle speed by 100 rpm or more.	Electric throttle control actuatorIntake air leakage
DTC CON	FIRMATION PROC	EDURE	
1.PRECC	NDITIONING		
ing the nex 1. Turn ig 2. Turn ig 3. Turn ig If the targe DTC CON TESTING	t test. gnition switch OFF and gnition switch ON. gnition switch OFF and et idle speed is out o FIRMATION PROCED CONDITION:	has been previously conducted, always p I wait at least 10 seconds. I wait at least 10 seconds. I the specified value, perform <u>EC-149</u> DURE. Ing procedure, confirm that battery ve	, "Description", before conducting
		temperature above –10°C(14°F).	olage is more than 11 v at lule.
• Always >:		temperature above –10°C(14°F).	onage is more than it v at fule.
• Always 2.PERFO 1. Start e 2. Turn ig 3. Turn ig 4. Turn ig 5. Restar	Serform the test at a SOTO 2. RM DTC CONFIRMA Ingine and warm it up to gnition switch OFF and gnition switch ON. gnition switch OFF and t engine and run it for	temperature above –10°C(14°F).	
• Always 2.PERFO 1. Start e 2. Turn ig 3. Turn ig 4. Turn ig 5. Restar 6. Check Is 1st trip I YES >>	Serform the test at a Second Contract of the test at a RM DTC CONFIRMA Ingine and warm it up to paition switch OFF and paition switch OFF and the tengine and run it for 1st trip DTC. DTC detected?	temperature above –10°C(14°F). TION PROCEDURE to normal operating temperature. I wait at least 10 seconds.	
Always Start e 2. PERFO 1. Start e 2. Turn ig 3. Turn ig 4. Turn ig 5. Restar 6. Check Is 1st trip I YES >: NO >:	> GO TO 2. RM DTC CONFIRMATING and warm it up for the second s	temperature above –10°C(14°F). TION PROCEDURE to normal operating temperature. I wait at least 10 seconds. I wait at least 10 seconds. at least 1 minute at idle speed.	INFOID:000000012406501

2. Listen for an intake air leakage after the mass air flow sensor.

Is intake air leakage detected?

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P0506 ISC SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

- YES
- >> Discover air leakage location and repair.
 >> Replace ECM. Refer to <u>EC-513</u>, "Removal and Installation". NO

P0507 ISC SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

P0507 ISC SYSTEM

Description

INFOID:000000012406502

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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.).

DTC Logic

INFOID:000000012406503

DTC DETECTION LOGIC

NOTE:

If DTC P0507 is displayed with other DTC, first perform the trouble diagnosis for the other DTC.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0507	Idle speed control sys- tem RPM higher than expected	The idle speed is more than the target idle speed by 200 rpm or more.	 Electric throttle control actuator Intake air leakage PCV system
DTC CON	FIRMATION PROC	EDURE	
1.PRECO	NDITIONING		
If DTC Con	firmation Procedure h	as been previously conducted, always	perform the following before conduct-
ing the nex 1. Turn ig		l wait at least 10 seconds.	
2. Turn ig	nition switch ON.		
		l wait at least 10 seconds. f the specified value, perform <u>EC-149</u>	. "Description", before conducting
DTC Confi	rmation Procedure.		, <u> </u>
	CONDITION: erforming the follow	ing procedure, confirm that battery v	oltage is more than 11 V at idle.
		temperature above –10°C(14°F).	
~	GO TO 2.		
	RM DTC CONFIRMA		
		to normal operating temperature. I wait at least 10 seconds.	
3. Turn ig	nition switch ON.		
		I wait at least 10 seconds. at least 1 minute at idle speed.	
6. Check	1st trip DTC.		
-	TC detected?		
	 Proceed to <u>EC-355.</u> INSPECTION END 	"Diagnosis Procedure".	
-	s Procedure		
Liagnosi	STICCCUIC		INFOID:000000012406504
1.CHECK	PCV HOSE CONNEG	CTION	
Confirm that	at PCV hose is connec	cted correctly.	
	ection result normal?		
YES >>	• GO TO 2.		

P0507 ISC SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair or replace malfunctioning part.

2. CHECK INTAKE AIR LEAKAGE

1. Start engine and let it idle.

2. Listen for an intake air leakage after the mass air flow sensor.

Is intake air leakage detected?

- YES >> Discover air leakage location and repair.
- NO >> Replace ECM. Refer to EC-513, "Removal and Installation".

< DTC/CIRCUIT DIAGNOSIS >

P050A, P050E COLD START CONTROL

Description

ECM controls ignition timing and engine idle speed when engine is started with pre-warming up condition. This control promotes the activation of three way catalyst by heating the catalyst and reduces emissions.

DTC Logic

DTC DETECTION LOGIC

NOTE: If DTC P050A, P050E is displayed with other DTC, first perform the trouble diagnosis for other DTC.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P050A	Cold start idle air control system performance	ECM does not control engine idle speed properly when engine is started with pre-warming up con- dition.	 Lack of intake air volume Fuel injection system
P050E	Cold start engine exhaust temper- ature too low	The temperature of the catalyst inlet does not rise to the proper temperature when the engine is started with pre-warming up condition.	• ECM
DTC CON	FIRMATION PROCEDURE		
1.PRECO	NDITIONING		
before cond 1. Turn ig 2. Turn ig 3. Turn ig TESTING (ducting the next test. Inition switch OFF and wait at Inition switch ON. Inition switch OFF and wait at CONDITION:		
>>	> GO TO 2.		
2.perfo	RM DTC CONFIRMATION PF	ROCEDURE-I	
 Turn ig Select Check With GS Follow the 	nition switch OFF and wait at nition switch ON. "DATA MONITOR" mode with the indication of "COOLAN T T procedure "With CONSULT" a	CONSULT. EMP/S".	
	> GO TO 3.		
NO-1 [If it		up the engine until the value of "COO	LAN TEMP/S" reaches 4°C
NO-2 [If it	(39°F) or more. Retry from s is above 36°C (97°F)]>>Cool	engine down to less than 36°C (97°F). F	Retry from step 1.
3.PERFO	RM DTC CONFIRMATION PF	ROCEDURE-II	
 Start th (104°F Check With GS Follow the 	e select lever in N range. he engine and warm up in idle) for more than 15 seconds. 1st trip DTC. ST procedure "With CONSULT" a	with the value of "COOLAN TEMP/S" be	etween 4°C (39°F) and 40°C
•) <u>TC detected?</u> > Proceed to EC-358 "Diagno	sis Procedure"	

YES >> Proceed to <u>EC-358, "Diagnosis Procedure"</u>.

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P050A, P050E COLD START CONTROL

[VQ35DE] < DTC/CIRCUIT DIAGNOSIS > NO >> INSPECTION END **Diagnosis** Procedure INEOID:000000012406507 **1.**PERFORM IDLE AIR VOLUME LEARNING Perform EC-149, "Description". Is Idle Air Volume Learning carried out successfully? YES >> GO TO 2. NO >> Follow the instruction of Idle Air Volume Learning. 2.CHECK INTAKE SYSTEM Check for the cause of intake air volume lacking. Refer to the following. Crushed intake air passage · Intake air passage clogging Clogging of throttle body Is the inspection result normal? YES >> GO TO 3. NO >> Repair or replace malfunctioning part ${\it 3.}$ CHECK FUEL INJECTION SYSTEM FUNCTION Perform DTC Confirmation Procedure for DTC P0171, P0174. Refer to EC-267, "DTC Logic". Is the inspection result normal? YES >> GO TO 4. NO >> Proceed to EC-268, "Diagnosis Procedure" for DTC P0171, P0174.

4.PERFORM DTC CONFIRMATION PROCEDURE

- 1. Turn ignition switch ON.
- 2. Erase DTC.
- 3. Perform DTC Confirmation Procedure. See EC-357, "DTC Logic".

Is the 1st trip DTC P050A, P050E displayed again?

- >> Replace ECM. Refer to EC-513, "Removal and Installation". YES
- NO >> INSPECTION END

P0520 EOP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P0520 EOP SENSOR

DTC Logic

DTC DETECTION LOGIC

P0520 EOP Sensor circuit) Image of pressure sensor is higher than 0.26 V. ed) • EOP sensor A voltage signal transmitted from the engine oil pressure sensor is higher than 4.9 • EOP sensor • EOP sensor DTC CONFIRMATION PROCEDURE • Avoltage signal transmitted from the engine oil pressure sensor is higher than 4.9 • EOP sensor DTC CONFIRMATION PROCEDURE • Avoltage signal transmitted from the engine oil pressure sensor is higher than 4.9 • EOP sensor PRECONDITIONING • Turn ignition switch OFF and wait at least 10 seconds. Turn ignition switch OFF and wait at least 10 seconds.	DTC No.	Trouble diagnosis (Trouble diagnosis content)	DTC detecting condition	Possible cause
pefore conducting the next test. Turm ignition switch OFF and wait at least 10 seconds. Turm ignition switch OFF and wait at least 10 seconds. >> GO TO 2. 2. CHECK ENGINE OIL LEVEL Turm ignition switch OFF. Check engine oil level. Refer to LU-8. "Inspection". S inspection result normal? YES >> GO TO 3. NO >> Check engine oil leak. Refer to LU-8. "Inspection". 3. PERFORM DTC CONFIRMATION PROCEDURE Start engine and let it idle for at least 5 seconds. Check 1st trip DTC. S inspection Version Seconds. Check 1st trip DTC. S inspection Proceed to EC-359. "Diagnosis Procedure". NO >> INSPECTION END Diagnosis Procedure CHECK EOP SENSOR POWER SUPPLY-I Turm ignition switch OFF. Disconnect EOP sensor harness connector. Turm ignition switch ON. Check the voltage between EOP sensor harness connector terminals.	P0520		 ly for 5 seconds or more: A voltage signal transmitted from the engine oil pressure sensor is lower than 0.26 V. A voltage signal transmitted from the engine oil pressure sensor is higher than 4.9 	(EOP sensor circuit is open or short- ed)EOP sensor
 2. Turn ignition switch ON. 3. Turn ignition switch OFF and wait at least 10 seconds. >> GO TO 2. 2. CHECK ENGINE OIL LEVEL 1. Turn ignition switch OFF. 2. Check engine oil level. Refer to <u>LU-8</u>, "Inspection". 3. inspection result normal? YES >> GO TO 3. NO >> Check engine oil leak. Refer to <u>LU-8</u>, "Inspection". 3. PERFORM DTC CONFIRMATION PROCEDURE 1. Start engine and let it idle for at least 5 seconds. 2. Check 1st trip DTC. a. Start engine and let it idle for at least 5 seconds. 2. Check 1st trip DTC detected? YES >> Proceed to <u>EC-359</u>. "Diagnosis Procedure". NO >> INSPECTION END Diagnosis Procedure I. CHECK EOP SENSOR POWER SUPPLY-I 1. Turn ignition switch OFF. 2. Disconnect EOP sensor harness connector. 3. Turn ignition switch ON. 4. Check the voltage between EOP sensor harness connector terminals. 			IRE	
2. CHECK ENGINE OIL LEVEL 1. Turn ignition switch OFF. 2. Check engine oil level. Refer to LU-8, "Inspection". 3. inspection result normal? YES >> GO TO 3. NO >> Check engine oil leak. Refer to LU-8, "Inspection". 3. PERFORM DTC CONFIRMATION PROCEDURE 1. Start engine and let it idle for at least 5 seconds. 2. Check 1st trip DTC. s 1st trip DTC detected? YES >> Proceed to EC-359, "Diagnosis Procedure". NO >> INSPECTION END Diagnosis Procedure NFOR DEMONDRIANCE OFF. 1. CHECK EOP SENSOR POWER SUPPLY-I 1. Turn ignition switch OFF. 2. Disconnect EOP sensor harness connector. 3. Turn ignition switch ON. 4. Check the voltage between EOP sensor harness connector terminals.	pefore con 1. Turn i 2. Turn i	nducting the next test. ignition switch OFF and wai ignition switch ON.	t at least 10 seconds.	perform the following procedure
2. Check engine oil level. Refer to LU-8, "Inspection". Is inspection result normal? YES YES YES >> Check engine oil leak. Refer to LU-8, "Inspection". 3.PERFORM DTC CONFIRMATION PROCEDURE 1. Start engine and let it idle for at least 5 seconds. 2. Check 1st trip DTC. Is 1st trip DTC detected? YES YES >> Proceed to EC-359, "Diagnosis Procedure". NO >> INSPECTION END Diagnosis Procedure I.CHECK EOP SENSOR POWER SUPPLY-I 1. Turn ignition switch OFF. 2. Disconnect EOP sensor harness connector. 3. Turn ignition switch ON. 4. Check the voltage between EOP sensor harness connector terminals.	-			
3. PERFORM DTC CONFIRMATION PROCEDURE 1. Start engine and let it idle for at least 5 seconds. 2. Check 1st trip DTC. 1. Start trip DTC detected? YES >> Proceed to EC-359. "Diagnosis Procedure". NO >> INSPECTION END Diagnosis Procedure 1. CHECK EOP SENSOR POWER SUPPLY-I 1. Turn ignition switch OFF. 2. Disconnect EOP sensor harness connector. 3. Turn ignition switch ON. 4. Check the voltage between EOP sensor harness connector terminals. EOP sensor Voltage	2. Chec <u>ls inspecti</u> YES >	k engine oil level. Refer to <u>l</u> ion result normal? >> GO TO 3.		
 2. Check 1st trip DTC. <u>Is 1st trip DTC detected?</u> YES >> Proceed to <u>EC-359</u>, "Diagnosis Procedure". NO >> INSPECTION END Diagnosis Procedure 1.CHECK EOP SENSOR POWER SUPPLY-I 1. Turn ignition switch OFF. 2. Disconnect EOP sensor harness connector. 3. Turn ignition switch ON. 4. Check the voltage between EOP sensor harness connector terminals. 	-	•		
1.CHECK EOP SENSOR POWER SUPPLY-I 1. Turn ignition switch OFF. 2. Disconnect EOP sensor harness connector. 3. Turn ignition switch ON. 4. Check the voltage between EOP sensor harness connector terminals.	2. Checl <u>Is 1st trip</u> YES >	k 1st trip DTC. <u>DTC detected?</u> >> Proceed to <u>EC-359, "Dia</u>		
 Turn ignition switch OFF. Disconnect EOP sensor harness connector. Turn ignition switch ON. Check the voltage between EOP sensor harness connector terminals. 	Diagnos	sis Procedure		INFOID:000000012406509
 2. Disconnect EOP sensor harness connector. 3. Turn ignition switch ON. 4. Check the voltage between EOP sensor harness connector terminals. 	1. CHEC	K EOP SENSOR POWER S	SUPPLY-I	
+ _ Voltage	 Disco Turn i 	nnect EOP sensor harness ignition switch ON.		
			Voltage	
terminal	Connect	or		

	Mallara		
Connector	+	_	Voltage (Approx.)
Connector	terminal		
F67	3	1	5 V

Is the inspection result normal?

YES >> GO TO 2. NO >> GO TO 4. INFOID:000000012406508

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P0520 EOP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

2. CHECK EOP SENSOR SIGNAL CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connectors.
- 3. Check the continuity between EOP sensor harness connector and ECM harness connector.

+		-		
EOP sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	
F67	2	F78	14	Existed

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

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3.CHECK EOP SENSOR

Check EOP sensor. Refer to EC-361, "Component Inspection".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41. "Intermittent Incident".

NO >> Repair or replace error-detected parts.

4.CHECK EOP SENSOR POWER SUPPLY-II

Check the voltage between EOP sensor harness connector terminal and ground.

EOP sensor - Voltage (Approx.) Connector Terminal - 5 V		÷	_	N / W	
Connector Terminal	EOP s	sensor		Voltage (Approx.)	
F67 3 Ground 5 V	Connector	Terminal			
	F67	3	Ground	5 V	

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 5.

5. CHECK EOP SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.

2. Disconnect ECM harness connectors.

3. Check the continuity between EOP sensor harness connector and ECM harness connector.

+		-		
EOP sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	
F67	3	F14	18	Existed

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

Is the inspection result normal?

YES >> Check sensor power supply 2 circuit. Refer to EC-497, "Diagnosis Procedure".

NO >> Repair or replace error-detected parts.

6.CHECK EOP SENSOR GROUND CIRCUIT

1. Turn ignition switch OFF.

2. Disconnect ECM harness connector.

3. Check the continuity between EOP sensor harness connector and ECM harness connector.

P0520 EOP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

FOP	sensor	E/	СМ	Continuity				
Connector	Terminal	Connector	Terminal	Continuity				
F67	1	F14	15	Existed	-			
	ction result n		10	Exictor				
/ES >> NO >>	GO TO 7. Repair or re	place error-d ND CIRCUIT	•	arts.				
heck the c	ontinuity bet	ween ECM h	arness co	nnector and gr	round.			
	+				•			
	ECM		-	Continuity				
Connector	- Termi	nal			_			
F14					-			
1 14	55							
F15	105	5						
	11() G	iround	Existed				
	147	7						
E19	147							
E19		9						
the inspec	149 152 ction result n	ormal?						
the inspective YES >>	149 152 Ction result n Check interr	ormal? nittent incide			mittent Inciden	<u>Ľ</u> .		
the inspect YES >> NO >>	149 152 2tion result n Check interr Repair or re	ormal? ormal ormal? nittent incide place error-d			mittent Inciden	<u>t"</u> .		
the inspect YES >> NO >>	149 152 Ction result n Check interr	ormal? ormal ormal? nittent incide place error-d			mittent Inciden	<u>t"</u> .	INFOID:0000000124065	10
<u>s the inspec</u> YES >> NO >> Compone	149 152 2tion result n Check interr Repair or re	ormal? ormal? nittent incide place error-d tion			mittent Inciden	<u>t"</u> .	INFOID:0000000124065	10
<u>s the inspec</u> YES >> NO >> Compone .CHECK I	149 152 2tion result n Check interr Repair or re ent Inspec	ormal? ormal? mittent incide place error-d tion			mittent Inciden	<u>t"</u> .	INFOID:0000000124065	10
the inspec YES >> NO >> Compone .CHECK F . Turn igr . Disconn	149 152 2tion result n Check interr Repair or re ent Inspec EOP SENSC Dition switch nect EOP sen	ormal? ormal? mittent incide place error-d tion DR OFF. nsor harness	letected pa	arts. r.		<u>t"</u> .	INFOID:0000000124065	10
the inspec YES >> NO >> Compone .CHECK F . Turn igr . Disconn	149 152 2tion result n Check interr Repair or re ent Inspec EOP SENSC Dition switch nect EOP sen	ormal? ormal? mittent incide place error-d tion DR OFF. nsor harness	letected pa	arts.		<u>t"</u> .	INFOID:0000000124065	10
the inspec YES >> NO >> COMPONE .CHECK I . Turn ign . Disconn . Check r	149 152 2tion result n Check interr Repair or re ent Inspec EOP SENSC Dition switch hect EOP sen esistance be	ormal? ormal? mittent incide place error-d tion DR OFF. nsor harness	letected pa	arts. r.		<u>t"</u> .	INFOID:0000000124065	10
the inspect YES >> NO >> CMPONE .CHECK I . Turn igr . Disconn . Check r	149 152 2tion result n Check interr Repair or re ent Inspec EOP SENSC Dition switch nect EOP sen	ormal? ormal? mittent incide place error-d tion DR OFF. nsor harness	etected pa	arts. r. nnector termin	als. Resistance		INFOID:0000000124065	10
the inspect YES >> NO >> COMPONE .CHECK I . Turn ign . Disconn . Check r EO	149 152 2tion result n Check interr Repair or re ent Inspec EOP SENSC DP SENSC DP sensor P sensor -	ormal? ormal? mittent incide place error-d tion DR OFF. nsor harness	letected pa	arts. r. nnector termin	als.		INFOID.0000000124065	110
the inspect YES >> NO >> COMPONE .CHECK I . Turn ign . Disconn . Check r EO	149 152 2tion result n Check interr Repair or re ent Inspec EOP SENSC DEOP SENSC D	ormal? ormal? mittent incide place error-d tion DR OFF. nsor harness	etected pa	arts. r. nnector termin	als. Resistance (kΩ)		INFOID:0000000124065	110
the inspec YES >> NO >> COMPONE .CHECK I . Turn ign . Disconn . Check r EO	149 152 2tion result n Check interr Repair or re ent Inspec EOP SENSC DP SENSC DP sensor P sensor - Terminal 2	ormal? ormal? mittent incide place error-d tion DR OFF. nsor harness	etected pa	arts. r. nnector termin	als. Resistance (kΩ) 4 – 10		INFOID:0000000124065	110
the inspec YES >> NO >> COMPONE .CHECK F . Turn igr . Disconn . Check r EO + T	149 152 2tion result n Check interr Repair or re ent Inspec EOP SENSC DEOP SENSC D	ormal? ormal? mittent incide place error-d tion DR OFF. nsor harness	connector sensor cor Conditio	arts. r. nnector termina	als. Resistance (kΩ)		INFOID:0000000124065	10
the inspec YES >> NO >> COMPONE .CHECK F . Turn igr . Disconn . Check r EO +	149 152 152 152 152 Check interr Repair or re ent Inspec EOP SENSC Dect EOP sensor P sensor erminal 2 3	ormal? ormal? mittent incide place error-d tion DR OFF. nsor harness	etected pa	arts. r. nnector termina	als. Resistance (kΩ) <u>4 - 10</u> 2 - 8		INFOID:0000000124065	110
the inspec YES >> NO >> COMPONE .CHECK F . Turn igr . Disconn . Check r EO + T	149 152 152 152 Check interr Repair or re ent Inspec EOP SENSC DP SENSOR P sensor - rerminal 2 3 1	ormal? ormal? mittent incide place error-d tion DR OFF. nsor harness	connector sensor cor Conditio	arts. r. nnector termina	als. Resistance (kΩ) 4 – 10 2 – 8 4 – 10		INFOID:0000000124065	10

YES >> INSPECTION END.

NO >> Replace EOP sensor. Refer to EM-39, "Exploded View".

< DTC/CIRCUIT DIAGNOSIS >

P0524 ENGINE OIL PRESSURE

DTC Logic

INFOID:000000012406511

[VQ35DE]

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis (Trouble diagnosis content)	DTC detecting condition	Possible cause
P0524	ENGINE OIL PRESSURE (Engine oil pressure too low)	An EOP sensor signal voltage applied to ECM remains lower than the specified value continuously for 10 seconds or more when the engine speed is 1,000 rpm or more.	 Decrease in engine oil pressure Decrease in engine oil level Engine oil condition EOP sensor Engine body

DTC CONFIRMATION PROCEDURE

If "EC-363, "Diagnosis Procedure"" is unfinished, be sure to perform Step 3 and 4.

1.PRECONDITIONING-1

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

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

2. Turn ignition switch ON.

3. Turn ignition switch OFF and wait at least 10 seconds.

TEST CONDITION:

Before performing the following procedure, confirm that battery voltage is 11 V or more at idle.

>> GO TO 2.

2. PRECONDITIONING-2

Is "Diagnosis Procedure" of DTC P0524 finished?

YES	>> GO TO 3.
NO	>> GO TO 4.
\mathbf{r}	

3. PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and warm it up to normal operating temperature.

2. Maintain the following conditions for about 10 consecutive seconds.

Selector lever	P or N position
Engine coolant temperature	70°C (158°F) or more
Engine speed	1,000 rpm or more

NOTE:

With engine speed set around 4,000 rpm, the phenomenon can be reproduced more easily.

3. Check DTC.

Is DTC detected?

YES >> Proceed to EC-363, "Diagnosis Procedure".

NO >> INSPECTION END

4.CHECK ENGINE OIL LEVEL

Check engine oil level. Refer to LU-8, "Inspection".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Proceed to EC-363, "Diagnosis Procedure".

5.CHECK ENGINE OIL PRESSURE

With CONSULT

P0524 ENGINE OIL PRESSURE

< DTC/CIRCUIT DIAGNOSIS >

Turn ignition switch ON.

1.

2. Select "DATA MONITOR" mode of "ENGINE" using CONSULT.

3. Start the engine and check that "EOP SENSOR" changes, according to engine speeds.

Monitor item	Condition		Value (Approx.)	E
	 Engine oil temperature: 80°C (176°F) Selector lever: P or N position 	Engine speed: Idle	1.45 V or more	
EOP SENSOR	 Air conditioner switch: OFF No load 	Engine speed: 2,000 rpm	2.85 V or more	
Without CONS	SULT pressure. Refer to <u>LU-8, "Inspect</u> i	on"		I
Is the inspection	· · · · · · · · · · · · · · · · · · ·	<u>.</u>		
YES >> GO NO >> Proc	TO 3. eed to <u>EC-363, "Diagnosis Procec</u>	<u>dure"</u> .		I
Diagnosis Pro	ocedure			INFOID:000000012406512
1 .CHECK ENG	INE OIL LEVEL			
 Turn ignition Check engin 	switch OFF. e oil level. Refer to <u>LU-8, "Inspect</u>	ion".		(
s the inspection	result normal?			
YES >> GO NO >> GO	-			ł
2.CHECK ENG	INE OIL PRESSURE			
	A MONITOR" mode of "ENGINE" u ine and check that "EOP SENSO			
Monitor item	Condition		Value (Approx.)	1
EOP SENSOR	Engine oil temperature: 80°C (176°F) Selector lever: P or N position	Engine speed: Idle	1.45 V or more	
LOF SENSOR	 Air conditioner switch: OFF No load	Engine speed: 2,000 rpm	2.85 V or more	
Without CONS	SULT level. Refer to <u>LU-8, "Inspection"</u> .			ľ
Is the inspection				
YES >> GO NO >> Cheo	TO 3. ck oil pump. Refer to <u>LU-14, "Rem</u>	oval and Installa	ation".	1
3. СНЕСК ЕОР				
Check EOP sens	or. Refer to <u>EC-364, "Component</u>	Inspection".		(
Is the inspection				
	ck intermittent incident. Refer to <u>G</u> air or replace error-detected parts.		<u>it incident"</u> .	
· ·	INE OIL LEAKAGE			I
Check engine oil	leakage. Refer to LU-8, "Inspection	<u>on"</u> .		
s the inspection				
YES >> GO	TO 5. air or replace error-detected parts			

NO >> Repair or replace error-detected parts.

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< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

$5. {\sf CHECK} \ {\sf CAUSE} \ {\sf OF} \ {\sf ENGINE} \ {\sf OIL} \ {\sf CONSUMPTION}$

Check the following item.

Step	Inspection item	Equipment	Standard	Reference
1	PCV valve	EC-512, "Work Procedure	<u>e"</u>	
2	Exhaust front tube	Visual	No blockingNo abnormal sounds	_
3	Oil pump	LU-14, "Removal and Installation"		
4	PistonPiston pinPiston ring	Piston to piston pin oil clearancePiston ring side clearancePiston ring end gap		EM-109, "Disassembly and Assembly"
5	Cylinder block	Cylinder block top surface distortion Piston to cylinder bore clearance		EM-117, "Inspection"

>> Repair or replace error-detected parts.

Component Inspection

INFOID:000000012406513

1.CHECK EOP SENSOR

- 1. Turn ignition switch OFF.
- 2. Disconnect EOP sensor harness connector.
- 3. Check resistance between EOP sensor connector terminals.

EOP sensor			Desistance	
+	_	Condition	Resistance (kΩ)	
Terr	minal		()	
1	2	None	4 – 10	
I	3		2 – 8	
2	1		4 – 10	
2	3		1 – 3	
3	1		2-8	
	2		1 – 3	

Is the inspection result normal?

YES >> INSPECTION END.

NO >> Replace EOP sensor. Refer to EM-39, "Exploded View".

< DTC/CIRCUIT DIAGNOSIS >

P052A, P052B, P052C, P052D INTAKE VALVE TIMING CONTROL

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P052A, P052B, P052C and P052D is displayed with DTC P0075, P0081 perform the trouble diagnosis for DTC P0075, P0081. Refer to <u>EC-196, "DTC Logic"</u>.

DTC No.	Trouble diagnosis (Trouble diagnosis content)	Detecting condition	Possible cause	
P052A	CAMSHAFT POSITION TIM- ING B1 (Cold start "A" camshaft posi- tion timing over-advanced bank 1)			
P052B	CAMSHAFT POSITION TIM- ING B1 (Cold start "A" camshaft posi- tion timing over-retarded bank 1)	There is a gap between the target phase angle and the detected phase angle when the engine is operating in cold conditions.	 Crankshaft position sensor Camshaft position sensor Intake valve timing control solenoid valve Intake valve timing intermediate lock control solenoid valve Accumulation of debris to the signal pick-up portion of the camshaft Timing chain installation Foreign matter caught in the intake valve timing control (or intermediate lock control) solenoid valve 	
P052C	CAMSHAFT POSITION TIM- ING B2 (Cold start "A" camshaft posi- tion timing over-advanced bank 2)			
P052D	CAMSHAFT POSITION TIM- ING B2 (Cold start "A" camshaft posi- tion timing over-retarded bank 2)			
4	NFIRMATION PROCED	DURE		

(P)With CONSULT

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

5. On the CONSULT screen, select "ENGINE" >> "DATA MONITOR" >> "COOLAN TEMP/S".

6. Check "COOLAN TEMP/S" indication value.

With GST

Follow the procedure "With CONSULT" above.

Is the value of "COOLAN TEMP/S"-5°C (23°F) and 45°C (113°F)?

YES >> GO TO 2.

NO-1 [if it is below – 5°C (23°F)]>>Warm up the engine until the value of "COOLAN TEMP/S" indicates –5°C (23°F) and 45°C (113°F). And then GO TO 2.

NO-2 [if it is above 45°C (113°F)]>>Cool the engine down to the value of "COOLAN TEMP/S" indicates –5°C (23°F) and 45°C (113°F). And then GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE-I

- 1. Turn ignition switch OFF and wait at 10 seconds.
- 2. Turn ignition switch ON.
- 3. Set the selector lever in N range.
- 4. Start the engine and let it idle for 20 seconds or more.
- 5. Check 1st trip DTC.

INFOID:000000012406514

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< DTC/CIRCUIT DIAGNOSIS >

Is 1st trip DTC detected?

YES >> Proceed to <u>EC-366</u>, "Diagnosis Procedure" NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000012406515

IVQ35DE1

1.INSPECTION START

With CONSULT>>GO TO 2. Without CONSULT>>GO TO 3.

2. CHECK VTC POSITION

With CONSULT

- 1. Turn ignition switch ON.
- 2. On the CONSULT screen, select "ENGINE" >> "DATA MONITOR" >> "COOLAN TEMP/S".
- 3. Check that the "COOLAN TEMP/S" indication value is between –5°C (23°F) and 45°C (113°F).
- 4. Start engine and wait at least 5 seconds.
- 5. On the CONSULT screen, select "ENGINE" >> "DATA MONITOR" >> "INT/V TIM (B1)".
- 6. Check that the data monitor item indicates as follows:

Item	Value (°CA)
INT/V TIM (B1)	10 ± 2
INT/V TIM (B2)	10 ± 2

Is the inspection result normal?

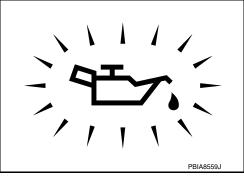
YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".

- NO >> GO TO 3.
- ${\it 3.}$ Check oil pressure warning LAMP
- 1. Start engine.

2. Check that oil pressure warning lamp is not illuminated.

Is oil pressure warning lamp illuminated?

YES >> Refer to <u>LU-8, "Inspection"</u>. NO >> GO TO 4.



4. CHECK INTAKE VALVE TIMING INTERMEDIATE LOCK CONTROL SOLENOID VALVE

Perform Component Inspection of the intake valve timing intermediate lock control solenoid valve. Refer to EC-368, "Component Inspection (Intake Valve Timing Intermediate Lock Control Solenoid Valve)".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE

Perform Component Inspection of the intake valve timing control solenoid valve. Refer to <u>EC-367, "Component Inspection (Intake Valve Timing Control Solenoid Valve)"</u>.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

O.CHECK CRANKSHAFT POSITION SENSOR

	A, P052B, P052C, P052D INTAKE VALVE TIMING CONTROL
< DTC/CIRCUIT E	DIAGNOSIS > [VQ35DE] ent Inspection of the crankshaft position sensor. Refer to EC-368, "Component Inspection
<u>(Crankshaft Position)</u>	
Is the inspection re	
YES >> GO TO NO >> Repair	D 7. r or replace error-detected parts.
	HAFT POSITION SENSOR
	ent Inspection of the camshaft position sensor. Refer to EC-369. "Component Inspection
(Camshaft position	
Is the inspection re	
YES >> GO TO NO >> Repair	D 8. r or replace error-detected parts.
8.CHECK CAMSI	
Check the following	
1. Accumulation	of debris on the signal plate of camshaft front end
2. Chipping signation ls the inspection re	al plate of camshaft front end
YES >> GO TO	
NO >> Remov	ve debris and clean the signal plate of camshaft
	end or replace camshaft. Refer to <u>EM-88.</u>
•	JPBIA5855ZZ
9. CHECK TIMING	G CHAIN INSTALLATION
	ords for any recent repairs that may cause timing chain misalignment.
•	rice records that may cause timing chain misalignment?
YES >> Check NO >> GO TO	t timing chain installation. Refer to <u>EM-69, "Removal and Installation"</u> . J
10.CHECK LUB	RICATION CIRCUIT
	n of Camshaft Sprocket (INT) Oil Groove". Refer to EM-91, "Inspection".
Is the inspection re	esult normal?
	t intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u> .
Component ins	spection (Intake Valve Timing Control Solenoid Valve)
1.CHECK INTAKE	E VALVE TIMING CONTROL SOLENOID VALVE-I
1. Turn ignition s	
	ake valve timing control solenoid valve harness connector. Note between intake valve timing control solenoid valve terminals as per the following.
Terminals	Resistance
1 and 2	7.0 - 7.8 Ω [at 20°C (68°F)]
1 or 2 and ground	$\stackrel{\propto \Omega}{} (\text{Continuity should not exist}) \qquad \qquad$
Is the inspection re	
YES >> GO TO NO >> Replace	C 2. Ce malfunctioning intake valve timing control solenoid valve. Refer to <u>EM-68, "Exploded</u>
<u>View"</u> .	
2. CHECK INTAKE	E VALVE TIMING CONTROL SOLENOID VALVE-II

1. Remove intake valve timing control solenoid valve. Refer to EM-68, "Exploded View".

Revision: October 2015

EC-367

< DTC/CIRCUIT DIAGNOSIS >

 Provide 12 V DC between intake valve timing control solenoid valve terminals 1 and 2, and then interrupt it. Check that the plunger moves as shown in the figure.
 CAUTION: Never apply 12 V DC continuously for 5 seconds or more.

Doing so may result in damage to the coil in intake valve timing control solenoid valve.

NOTE:

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace malfunctioning intake valve timing control solenoid valve. Refer to <u>EM-68</u>, "<u>Exploded</u> <u>View</u>".

Component Inspection (Intake Valve Timing Intermediate Lock Control Solenoid Valve)

INFOID:000000012406517

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IVQ35DE1

1. CHECK INTAKE VALVE TIMING INTERMEDIATE LOCK CONTROL SOLENOID VALVE-I

- 1. Turn ignition switch OFF.
- 2. Disconnect intake valve timing intermediate lock control solenoid valve harness connector.
- 3. Check resistance between intake valve timing intermediate lock control solenoid valve terminals as per the following.

Terminals	Resistance	
1 and 2	7.0 - 7.8 Ω [at 20°C (68°F)]	
1 or 2 and ground	${}^\infty \Omega$ (Continuity should not exist)	

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace malfunctioning intake valve timing intermediate lock control solenoid valve. Refer to <u>EM-68. "Exploded View"</u>.

$2. \mathsf{CHECK} \text{ INTAKE VALVE TIMING INTERMEDIATE LOCK CONTROL SOLENOID VALVE-II}$

- 1. Remove intake valve timing intermediate lock control solenoid valve. Refer to EM-68, "Exploded View".
- Provide 12 V DC between intake valve timing intermediate lock control solenoid valve terminals 1 and 2, and then interrupt it. Check that the plunger moves as shown in the figure.
 CAUTION:

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

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

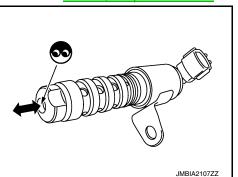
Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Replace malfunctioning intake valve timing intermediate lock control solenoid valve. Refer to <u>EM-68. "Exploded View"</u>.

Component Inspection (Crankshaft Position sensor)

1.CHECK CRANKSHAFT POSITION SENSOR (POS)-1

- 1. Turn ignition switch OFF.
- 2. Loosen the fixing bolt of the sensor.
- 3. Disconnect crankshaft position sensor (POS) harness connector.
- 4. Remove the sensor.



INFOID:000000012406518

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

>> GO TO 2.

Visually check the sensor for chipping.

39, "Exploded View".

5.

YES

NO

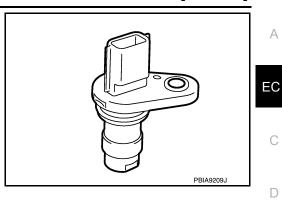


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2.CHECK CRANKSHAFT POSITION SENSOR (POS)-2

Check the resistance between crankshaft position sensor (POS) terminals as per the following.

>> Replace crankshaft position sensor (POS). Refer to EM-

Crankshaft posi	tion sensor (POS)		•	
+	-	Resistance [at 25°C (77°F)]		
Termina	l (Polarity)			F
1	2		-	
I	3	Except 0 or ∞ Ω		(
2	3			
	PECTION END	osition sensor (POS). Refer to	EM-39, "Exploded View".	ŀ
Component I	nspection (Ca	amshaft position sensor)	INFOID:000000012406519	ſ
		N SENSOR (PHASE)-1		1
		N SENSOR (PRASE)-1		
	n switch OFF. fixing bolt of the s	ensor		C.
4. Remove the 5. Visually che <u>Is the inspection</u> YES >> GO NO >> Rep	e sensor. ck the sensor for result normal? TO 2.	osition sensor (PHASE). Refe	er to	K L
2 011501 000			PBIA9876J	P
		N SENSOR (PHASE)-2		
Check the resist	ance camshaft po	sition sensor (PHASE) termina	Is as per the following.	С
Camshaft po	osition sensor (PHASE	Ξ)		
+	_	Resistance [Ω at 25°C (7	7°F)]	Ρ

Is the inspection result normal?

1

2

Terminals (Polarity)

2

3

3



Except 0 or ∞

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

YES >> INSPECTION END

NO >> Replace camshaft position sensor (PHASE). Refer to EM-54, "Removal and Installation".

P0603, P062F ECM

< DTC/CIRCUIT DIAGNOSIS >

P0603, P062F ECM

DTC Description

INFOID:000000012406520

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EC

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms	DTC detecting condition
P0603	(Trouble diagnosis content) ECM BACK UP/CIRCUIT [Internal Control Module Keep Alive Memo- ry (KAM) Error]	ECM buck up system does not function properly.
P062F	CONTROL MODULE (Internal control module EEPROM error)	EEPROM (built-in microcomputer) system internal ECM does not function properly.
POSSIBL	ECAUSE	
DTC P0603 • Harness • ECM	or connectors (ECM power supply cir	cuit is open or shorted.)
DTC P062F ECM		
FAIL-SAF Not applica		
	FIRMATION PROCEDURE	
1.PRECC	NDITIONING	
1. Turn ig	e following procedure before performi inition switch OFF and wait at least 1 inition switch ON.	
	nition switch OFF and wait at least 1	0 seconds.
>:	> GO TO 2.	
•	RM DTC CONFIRMATION PROCED	URE FOR DTC P062F
1. Start e	ngine and wait at least 10 seconds.	
	nition switch OFF and wait at least 1 t steps 1 and 2 for 4 times.	0 seconds.
4. Turn ig 5. Erase	nition switch ON.	
 6. Turn ig 7. Start e 	nition switch OFF and wait at least 10 ngine and wait at least 10 seconds. 1st trip DTC.	0 seconds.
	DTC detected?	
	Proceed to <u>EC-372</u> , "Diagnosis Proceed to <u>EC-372</u> , "Diagn	cedure".
	> GO TO 3.RM DTC CONFIRMATION PROCED	
	inition switch OFF and wait at least 1	
 Turn ig Turn ig Turn ig Repeat 	nition switch ON and wait at least 10 nition switch OFF and wait at least 5 nition switch ON and wait at least 10 t steps 3 and 4 for 5 times.	seconds. minutes.
	nition switch ON. 1st trip DTC.	
	DTC detected?	
	 Proceed to <u>EC-372, "Diagnosis Pro-</u> INSPECTION END 	cedure".

< DTC/CIRCUIT DIAGNOSIS >

Diagnosis Procedure

[VQ35DE]

1.INSPECTION START

Check that the battery negative terminal is not disconnected during ignition switch ON. Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.ERASE DTC

- 1. Start the engine and let it idle at least 10 seconds.
- 2. Turn ignition switch OFF.
- 3. Repeat steps 1 and 2 for 4 times.
- 4. Erase DTC.
- 5. Turn ignition switch OFF and wait at least 10 seconds.
- 6. Start the engine and let it idle for 10 seconds.
- 7. Check 1st trip DTC.

Is DTC P062F detected again?

YES >> Replace ECM. Refer to <u>EC-513</u>, "Removal and Installation".

NO >> INSPECTION END

3.CHECK ECM POWER SUPPLY AND GROUND CIRCUIT

Check ECM power supply and ground circuit. Refer to EC-175. "Diagnosis Procedure".

Is the inspection result normal?

- YES >> GO TO 4.
- NO >> Repair or replace error-detected parts.
- **4.**CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.

2. Erase DTC.

3. Perform DTC confirmation procedure. Refer to <u>EC-371, "DTC Description"</u>.

- Is the DTC P0603 or P062F detected again?
- YES >> Replace ECM. Refer to EC-513, "Removal and Installation".
- NO >> INSPECTION END

< DTC/CIRCUIT DIAGNOSIS > P0604 ECM

DTC DETECTION LOGIC

DTC Logic

INFOID:000000012406522

CONSULT screen terms DTC No. DTC detecting condition Possible cause (Trouble diagnosis content) ECM [Internal control module P0604 ECM Malfunction in the internal RAM of ECM. random access memory (RAM) error] DTC CONFIRMATION PROCEDURE 1.PRECONDITIONING 1. Turn ignition switch OFF and wait at least 10 seconds. 2. Turn ignition switch ON. 3. Turn ignition switch OFF and wait at least 10 seconds. **TESTING CONDITION:** Before performing the following procedure, confirm that battery voltage is 11 V or more with ignition switch ON. >> GO TO 2. 2. PERFORM DTC CONFIRMATION PROCEDURE 1. Turn ignition switch ON (engine stopped) and wait least 20 minutes. **CAUTION:** Never start engine during this procedure. 2. Turn ignition switch OFF and wait at least 10 seconds. 3. Turn ignition switch ON. Check 1st trip DTC. 4. Is 1st trip DTC detected? YES >> Proceed to EC-373, "Diagnosis Procedure". NO >> INSPECTION END Diagnosis Procedure INFOID:000000012406523 1.PERFORM DTC CONFIRMATION PROCEDURE 1. Turn ignition switch ON. 2. Erase DTC. 3. Perform DTC confirmation procedure. Refer to EC-373, "DTC Logic". Is the 1st trip DTC P0604 displayed again? YES >> Replace ECM. Refer to EC-513, "Removal and Installation". NO >> INSPECTION END

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< DTC/CIRCUIT DIAGNOSIS > P0605 ECM

INFOID:000000012406524

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P0605	ECM [Internal control module read only memory (ROM) error]	Malfunction in the internal ROM of ECM.	ECM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is 11 V or more with ignition switch ON.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON (engine stopped) and wait least 20 minutes. **CAUTION:**

Never start engine during this procedure.

- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Turn ignition switch ON.
- 4. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to EC-374, "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000012406525

1.PERFORM DTC CONFIRMATION PROCEDURE

- 1. Turn ignition switch ON.
- 2. Erase DTC.
- 3. Perform DTC confirmation procedure. Refer to EC-374, "DTC Logic".
- Is the 1st trip DTC P0605 displayed again?
- YES >> Replace ECM. Refer to EC-513, "Removal and Installation".
- NO >> INSPECTION END

< DTC/CIRCUIT DIAGNOSIS > P0606 ECM

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EC

INFOID:000000012406526

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P0606	CONTROL MODULE (Control module processor)	Malfunction in ECM processor.	ECM
	FIRMATION PROCE	DURE	
1.PRECO	ONDITIONING		
2. Turn i 3. Turn i TESTING		vait at least 10 seconds.	oltage is 11 V or more with ignition
>	> GO TO 2.		
~	ORM DTC CONFIRMATI	ON PROCEDURE-I	
	gnition switch ON (engin	e stopped) and wait at least 10 secon	ids.
2. Turn i 3. Turn i 4. Checł <u>Is 1st trip </u> YES >	r start engine during th gnition switch OFF and v gnition switch ON. < 1st trip DTC. <u>DTC detected?</u> > Proceed to <u>EC-375. "E</u> > GO TO 3.	vait at least 10 seconds.	
3.PERFC	ORM DTC CONFIRMATI	ON PROCEDURE-II	
 Start e Rev u the ac Let the Turn i Turn i 	engine.	approximately 3,000 rpm under unloa least 10 seconds.	ded condition and completely release
YES >	<u>DTC detected?</u> > Proceed to <u>EC-375. "[</u> > INSPECTION END	Diagnosis Procedure".	
-	is Procedure		INFOID:000000012406527
1.PERFC	ORM DTC CONFIRMATI	ON PROCEDURE	
2. Erase 3. Perfor		cedure for 3 times. Refer to <u>EC-375. '</u> d again?	"DTC Logic".

NO >> INSPECTION END

< DTC/CIRCUIT DIAGNOSIS > P0607 ECM

DTC Logic

INFOID:000000012406528

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P0607	ECM (Control module perfor- mance)	ECM internal communication system is malfunc- tioning.	ECM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is 11 V or more with ignition switch ON.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- 1. Turn ignition switch ON (engine stopped) and wait least 10 seconds.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Turn ignition switch ON.
- 4. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to EC-376, "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000012406529

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.

- 2. Erase DTC.
- 3. Perform DTC confirmation procedure. Refer to <u>EC-376. "DTC Logic"</u>.
- Is the 1st trip DTC P0607 displayed again?
- Yes >> Replace ECM. Refer to EC-513, "Removal and Installation".
- No >> INSPECTION END

< DTC/CIRCUIT DIAGNOSIS > P060A ECM

DTC DETECTION LOGIC

DTC Logic

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INFOID:000000012406530

[VQ35DE]

CONSULT screen terms DTC No. DTC detecting condition Possible cause (Trouble diagnosis content) CONTROL MODULE (Internal control module ECM internal monitoring processor is malfunction-ECM P060A monitoring processor pering. formance) DTC CONFIRMATION PROCEDURE 1.PRECONDITIONING 1. Turn ignition switch OFF and wait at least 10 seconds. 2. Turn ignition switch ON. 3. Turn ignition switch OFF and wait at least 10 seconds. **TESTING CONDITION:** Before performing the following procedure, confirm that battery voltage is 11 V or more with ignition switch ON. >> GO TO 2. 2. PERFORM DTC CONFIRMATION PROCEDURE 1. Start engine and wait at least 10 seconds. 2. Turn ignition switch OFF and wait at least 10 seconds. Repeat step 1 and 2 for 5 times. 3. Turn ignition switch ON. 4. Check 1st trip DTC. 5. Is 1st trip DTC detected? YES >> Proceed to EC-377, "Diagnosis Procedure". >> INSPECTION END NO **Diagnosis** Procedure INFOID:000000012406531 1.PERFORM DTC CONFIRMATION PROCEDURE 1. Turn ignition switch ON. Erase DTC. 2. 3. Perform DTC confirmation procedure. Refer to EC-377, "DTC Logic". Is the 1st trip DTC P060A displayed again? YES >> Replace ECM. Refer to EC-513, "Removal and Installation". NO >> INSPECTION END

< DTC/CIRCUIT DIAGNOSIS > P060B ECM

INFOID:000000012406532

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P060B	CONTROL MODULE (Internal control module A/ D processing performance)	ECM internal analog/digital conversion processing system is malfunctioning.	ECM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is 11 V or more with ignition switch ON.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- 1. Turn ignition switch ON (engine stopped) and wait least 10 seconds.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Turn ignition switch ON.
- 4. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to EC-378, "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000012406533

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.

- 2. Erase DTC.
- 3. Perform DTC confirmation procedure. Refer to <u>EC-378, "DTC Logic"</u>.
- Is the 1st trip DTC P060B displayed again?
- YES >> Replace ECM. Refer to EC-513, "Removal and Installation".
- NO >> INSPECTION END

P0643 SENSOR POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

P0643 SENSOR POWER SUPPLY

DTC Logic

INFOID:0000000012406534

[VQ35DE]

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0643	Sensor power supply circuit short	ECM detects that the voltage of power source for sensor is excessively low or high.	 Harness or connectors (APP sensor 1 circuit is shorted.) (TP sensor circuit is shorted.) [CKP sensor (POS) circuit is shorted.] (EVT control position sensor circuit is shorted.) (MAF sensor circuit is shorted.) Accelerator pedal position sensor Throttle position sensor Crankshaft position sensor (POS) Exhaust valve timing control position sensor Mass air flow sensor
	FIRMATION PROC	CEDURE	
	NDITIONING		
ing the next 1. Turn ig 2. Turn ig 3. Turn ig	t test. nition switch OFF ar nition switch ON. nition switch OFF ar	has been previously conducted, alwand wait at least 10 seconds. Ind wait at least 10 seconds.	ays perform the following before conduct-
	CONDITION: forming the followi	ing procedure, confirm that battery	voltage is more than 10 V at idle.
•	GO TO 2.		
2.PERFOR	RM DTC CONFIRM	ATION PROCEDURE	
1. Start er 2. Check	ngine and let it idle fo	or 1 second.	
Is DTC dete	-		
YES >> NO >>	Proceed to EC-379	<u>, "Diagnosis Procedure"</u> .	
	s Procedure		INFOID:000000012406535
Diagnosi			
	SENSOR POWER	SUPPLY 1	
1. CHECK 1. Turn ig 2. Discon 3. Turn ig	nition switch OFF. nect ECM harness o nition switch ON.		I.

	+			
E	CM	_	Voltage (Approx.)	
Connector	Terminal		()))))))))))))))))))	
E19	146			
F14	28	Ground	5 V	
F15	98			

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".

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P0643 SENSOR POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

NO >> GO TO 2.

2. CHECK SENSOR POWER SUPPLY 1 CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect following sensor harness connector.

Check harness for short to power and to ground, between the following terminals. 3.

ECM		Sensor		
Connector	Terminal	Name	Connector	Terminal
E19	146	APP sensor 1	E110	4
	28	CKP sensor (POS)	F20	1
F14		MAF sensor	F68	1
F 14		EVT control position sensor (bank 1)	F43	1
		EVT control position sensor (bank 2)	F44	1
F15	98	TP sensor	F50	5

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3. CHECK COMPONENTS

Check the following.

- Accelerator pedal position (APP) sensor 1 (Refer to <u>EC-451, "Component Inspection"</u>.)
 Crankshaft position (CKP) sensor (POS) (Refer to <u>EC-299, "Component Inspection"</u>.)
- Exhaust valve timing (EVT) control position sensor [Refer to EC-188, "Component Inspection (Exhaust Valve Timing Control Position Sensor)".]
- Mass air flow (MAF) sensor (Refer to <u>EC-203, "Component Inspection"</u>.)
- Throttle position (TP) sensor (Refer to EC-220, "Component Inspection".)

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
- NO >> Replace malfunctioning component.

< DTC/CIRCUIT DIAGNOSIS >

P0850 PNP SWITCH

Description

When the selector lever position is P or N, park/neutral position (PNP) signal from the TCM is sent to ECM.
DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0850	Park/neutral position switch	The signal of the park/neutral position (PNP) signal does not change during driving after the engine is started.	 Harness or connectors [The park/neutral position (PNP) signal circuit is open or shorted.] TCM
DTC CON	FIRMATION PROC	EDURE	
1.INSPEC	TION START		
	ULT be used?		
	ULT be used?		
	• GO TO 2. • GO TO 5.		
2.preco	NDITIONING		
		as been previously conducted, always p	perform the following before conduct-
ing the nex 1. Turn ig		l wait at least 10 seconds.	
2. Turn ig	nition switch ON.		
3. Turn ig	nition switch OFF and	l wait at least 10 seconds.	
>>	• GO TO 3.		
3.снеск	PNP SIGNAL		
With CO	NSULT		
	nition switch ON. "P/N POSLSW" in "D/	ATA MONITOR" mode with CONSULT. T	hen check the "P/N POSI SW" signal
	he following condition		
Posi	tion (Selector lever)	Known-good signal	
N or P positi		ON	
Except abov		OFF	
Is the inspe	ection result normal?		
	GO TO 4.		
4	 Proceed to <u>EC-382</u>, RM DTC CONFIRMATION 	"Diagnosis Procedure".	
	"DATA MONITOR" ma		
2. Start ei	ngine and warm it up t	to normal operating temperature.	
 Mainta CAUTI 		ions for at least 50 consecutive seconds	3.
	s drive vehicle at a s	afe speed.	
ENG SPEED	0 1,100) - 6,375 rpm	

ENG SPEED	1,100 - 6,375 rpm
COOLAN TEMP/S	More than 70°C (158°F)
B/FUEL SCHDL	3.0 - 31.8 msec

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P0850 PNP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

VHCL SPEED SE	More than 64 km/h (40 mph)
Selector lever	Suitable position

4. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to EC-382, "Diagnosis Procedure".

NO >> INSPECTION END

5.PERFORM COMPONENT FUNCTION CHECK

Perform component function check. Refer to <u>EC-382, "Component Function Check"</u>.

NOTE:

Use component function check to check the overall function of the park/neutral position (PNP) signal circuit. During this check, a 1st trip DTC might not be confirmed.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to <u>EC-382</u>, "Diagnosis Procedure".

Component Function Check

1.PERFORM COMPONENT FUNCTION CHECK

- 1. Turn ignition switch ON.
- 2. Check the voltage between ECM harness connector terminals.

ECM						
Connector	+	Connector	-	Condition		Voltage
Connector	Terminal	Connector	Terminal			
F15	83	E19	152	Selector lever	P or N	Battery voltage
115	5	L15	152	position	Except above	Approx. 0 V

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to EC-382, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:000000012406539

1. CHECK TRANSMISSION RANGE SWITCH POWER SUPPLY

- 1. Turn ignition switch OFF.
- 2. Disconnect transmission range switch harness connector.

3. Turn ignition switch ON.

4. Check the voltage between transmission range switch harness connector and ground.

Transmissior	+ Transmission range switch		Voltage
Connector	Terminal	-	
F17	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.CHECK TRANSMISSION RANGE SWITCH POWER SUPPLY CIRCUIT

- 2. Disconnect IPDM E/R harness connector.
- Check the continuity between transmission range switch harness connector and IPDM E/R harness connector.

INFOID:000000012406538

^{1.} Turn ignition switch OFF.

P0850 PNP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

Transmission Connector					
Connector	range switch	IPDM		Continuity	
	Terminal	Connector	Terminal		
F17	1	F12	74	Existed	
Also che	ck harness	for short to g	round.		
•	<u>tion result n</u>				
				ver supply ci	cuit.
		place error-d	•		
.CHECK I	RANSMISS	SION RANGE	SWITCHS	GIGNAL CIRC	UII
	ition switch				
		rness connec		ango switch k	parages connector and ECM barpage connector
Check li	le continuity	Delween lia	ISTIISSION	ange switch i	arness connector and ECM harness connector.
Franemiesion	range switch	EC	ΥM.	<u> </u>	
Connector	Terminal	Connector	Terminal	Continuity	
				E dista d	
F17	2	F15	83	Existed	
		for short to g	round and t	o power.	
-	<u>tion result n</u>	ormal?			
-	GO TO 4. Donoir or ro	alaaa arrar d	ataatad nam	-	
	•	place error-d	-	S.	
CHECK T	RANSMISS	ION RANGE	SWITCH		
neck the tra	ansmission I	range switch	. Refer to T	M-98, "Comp	opent Inspection"
the inspec	<u>tion result n</u>				nent mopeotion .
		<u>ormal?</u>			
	Check interr	nittent incide			nittent Incident".
10 >>	Check interr There is mal	nittent incide	ansmission		
IO >> ⁻	Check interr There is mal	nittent incide	ansmission		nittent Incident".
10 >>	Check interr There is mal	nittent incide	ansmission		nittent Incident".
0 >>	Check interr There is mal	nittent incide	ansmission		nittent Incident".
0 >>	Check interr There is mal	nittent incide	ansmission		nittent Incident".
IO >> ⁻	Check interr There is mal	nittent incide	ansmission		nittent Incident".
IO >> ⁻	Check interr There is mal	nittent incide	ansmission		nittent Incident".
0 >>	Check interr There is mal	nittent incide	ansmission		nittent Incident".
10 >>	Check interr There is mal	nittent incide	ansmission		nittent Incident".
IO >> ⁻	Check interr There is mal	nittent incide	ansmission		nittent Incident".
0 >>	Check interr There is mal	nittent incide	ansmission		nittent Incident".
0 >>	Check interr There is mal	nittent incide	ansmission		nittent Incident".
IO >> ⁻	Check interr There is mal	nittent incide	ansmission		nittent Incident".
10 >>	Check interr There is mal	nittent incide	ansmission		nittent Incident".
IO >> ⁻	Check interr There is mal	nittent incide	ansmission		nittent Incident".
IO >> ⁻	Check interr There is mal	nittent incide	ansmission		nittent Incident".
10 >>	Check interr There is mal	nittent incide	ansmission		nittent Incident".
10 >> -	Check interr There is mal	nittent incide	ansmission		nittent Incident".

< DTC/CIRCUIT DIAGNOSIS >

P1078, P1084 EVT CONTROL POSITION SENSOR

DTC Description

DTC DETECTION LOGIC

NOTE:

If DTC P1078 or P1084 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. Refer to <u>EC-379, "DTC Logic"</u>.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	
P1078	EXH TIM SEN/CIRC-B1 [Exhaust valve timing (EVT) control position sensor (bank 1) circuit]		
P1084	EXH TIM SEN/CIRC-B2 [Exhaust valve timing (EVT) control position sensor (bank 2) circuit]	An excessively high or low voltage from the sensor is sent to ECM.	

POSSIBLE CAUSE

DTC P1078

- Harness or connectors [EVT control position sensor (bank 1) circuit is open or shorted.]
- EVT control position sensor
- Crankshaft position (CKP) sensor
- Camshaft position (CMP) sensor (bank 1)
- Accumulation of debris to the signal pick-up portion of the camshaft

DTC P1084

- Harness or connectors
- EVT control position sensor (bank 2) circuit is open or shorted.
- Sensor power supply 2 circuit is open or shorted.
- EVT control position sensor (bank 2)
- · Each sensor, connected with sensor power supply 2 circuit
- Accumulation of debris to the signal pick-up portion of the camshaft

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P1078 or P0184 is displayed with DTC P0643, first perform the confirmation procedure (trouble diagnosis) for DTC P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to <u>EC-379</u>, "DTC Logic".
- NO >> GO TO 2.

2. PRECONDITIONING

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

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

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

>> GO TO 3.

3. PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and let it idle for 10 seconds.

2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to EC-385, "Diagnosis Procedure".

NO-2 >> Confirmation after repair: INSPECTION END

NO-1 >> To check malfunction symptom before repair: Refer to GI-41, "Intermittent Incident".

< DTC/CIRCUIT DIAGNOSIS >

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1.CHECK DTC PRIORITY

Diagnosis Procedure

If DTC P1078 is displayed with DTC P0643, first perform the confirmation procedure (trouble diagnos DTC P0643.	is) for

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to <u>EC-379, "DTC Logic"</u>.

NO >> GO TO 2.

2.CHECK EXHAUST VALVE TIMING (EVT) CONTROL POSITION SENSOR POWER SUPPLY

- 1. Disconnect EVT control position sensor harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between EVT control position sensor harness connector and ground.

		+					
DTC	EVT control position sensor			– Voltage (V)		sensor –	
	Bank	Connector	Terminal				
P1078	1	F43	1	Ground	Approx. 5		
P1084	2	F44	1	Ground	Αρριολ. 5		

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3. CHECK EVT CONTROL POSITION SENSOR POWER SUPPLY CIRCUIT FOR OPEN

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check the continuity between EVT control position sensor harness connector and ECM harness connector.

DTC	EVT	control position	sensor	E	CM	Continuity
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity
P1078	1	F43	1	F14	28	Existed
P1084	2	F44	1	1 14	20	LAISteu

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

4.CHECK EVT CONTROL POSITION SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.

2. Disconnect ECM harness connector.

Check the continuity between EVT control position sensor harness connector and ECM harness connector.

			+			_	
	DTC	EVT o	EVT control position sensor			СМ	Continuity
		Bank	Connector	Terminal	Connector	Terminal	
_	P1078	1	F43	2	F14	40	Existed
-	P1084	2	F44	2	1 14	40	LAISIEU

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

Is the inspection result normal?

YES >> GO TO 5.

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

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< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

5. CHECK EVT CONTROL POSITION SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between exhaust valve timing control position sensor harness connector and ECM harness connector.

	+			-	_	
DTC	EVT control position sensor			EC	CM	Continuity
	Bank	Connector	Terminal	Connector	Terminal	
P1078	1	F43	3	F14	37	Existed
P1084	2	F44	3	1 14	39	LAISIEU

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

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6.CHECK EVT CONTROL POSITION SENSOR

Check exhaust valve timing control position sensor. Refer to <u>EC-386</u>, "Component Inspection (Exhaust Valve Timing Control Position Sensor)".

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace malfunctioning EVT control position sensor. Refer to EM-54, "Exploded View".

7.CHECK CKP SENSOR

Check Crankshaft position sensor. Refer to EC-299, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 8.

NO >> Replace crankshaft position sensor. Refer to EM-39, "Exploded View".

8.CHECK CMP SENSOR

Check camshaft position sensor. Refer to EC-303. "Component Inspection".

Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace malfunctioning camshaft position sensor. Refer to EM-54, "Exploded View".

9.CHECK CAMSHAFT (EXH)

Check the following.

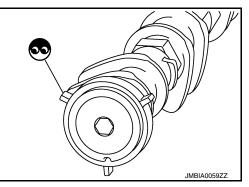
• Accumulation of debris to the signal plate of camshaft rear end

Chipping signal plate of camshaft rear end

Is the inspection result normal?

YES >> INSPECTION END

NO >> Remove debris and clean the signal plate of camshaft rear end or replace camshaft. Refer to EM-88, "Removal and Installation".



Component Inspection (Exhaust Valve Timing Control Position Sensor)

INFOID:000000012406542

1. EXHAUST VALVE TIMING CONTROL POSITION SENSOR - 1

- 1. Turn ignition switch OFF.
- 2. Disconnect exhaust valve timing control position sensor harness connector.
- 3. Loosen the fixing bolt of the sensor.
- 4. Remove the exhaust valve timing control position sensor. Refer to EM-54, "Exploded View".

< DTC/CIRCUIT DIAGNOSIS >

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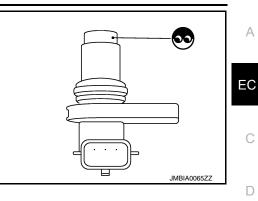
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- 5. Visually check the sensor for chipping.
- Is the inspection result normal?
- YES >> GO TO 2.
- >> Replace malfunctioning exhaust valve timing control NO position sensor. Refer to EM-54, "Exploded View".



2. EXHAUST VALVE TIMING CONTROL POSITION SENSOR - 2

Check resistance exhaust valve timing control position sensor terminals as follows.

	xhaust valve timing control position sensor		tion		
+	_			Resistance	
Tern	minal				
1	2				
1	3	Temperature	25°C (77°F)	Except 0 Ω or ∞ Ω	
2	3				

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace malfunctioning exhaust valve timing control position sensor. Refer to EM-54, "Exploded View".

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< DTC/CIRCUIT DIAGNOSIS >

P1148, P1168 CLOSED LOOP CONTROL

DTC Logic

DTC DETECTION LOGIC NOTE: DTC P1148 or P1168 is displayed

DTC P1148 or P1168 is displayed with another DTC for A/F sensor 1. Perform the trouble diagnosis for the corresponding DTC.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1148	Closed loop control function (bank 1)	The closed loop control function for bank 1 does not operate even when vehicle is being driven in the specified condition.	Harness or connectors (The A/F sensor 1 circuit is open or short- ed.)
P1168	Closed loop control function (bank 2)	The closed loop control function for bank 2 does not operate even when vehicle is being driven in the specified condition.	

INFOID:000000012406543

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P1212 TCS COMMUNICATION LINE

< DTC/CIRCUIT DIAGNOSIS >

P1212 TCS COMMUNICATION LINE

Description

This CAN communication line is used to control the smooth engine operation during the TCS operation. Pulse signals are exchanged between ECM and "ABS actuator and electric unit (control unit)". Be sure to erase the malfunction information such as DTC not only for "ABS actuator and electric unit (control unit)" but also for ECM after TCS related repair.

DTC Logic

DTC DETECTION LOGIC

NOTE:

- If DTC P1212 is displayed with DTC UXXXX, first perform the trouble diagnosis for DTC UXXXX.
- If DTC P1212 is displayed with DTC P0607, first perform the trouble diagnosis for DTC P0607. Refer to <u>EC-376, "DTC Logic"</u>.

Freeze frame data is not stored in the ECM for this self-diagnosis.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	F
P1212	TCS communication line	ECM cannot receive the information from "ABS actuator and electric unit (control unit)" continuously.	 Harness or connectors (The CAN communication line is open or short- ed.) ABS actuator and electric unit (control unit) Dead (Weak) battery 	G

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

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

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10.5 V at idle.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

Start engine and let it idle for at least 10 seconds. 1. Check 1st trip DTC. 2. Is 1st trip DTC detected? M YES >> Proceed to EC-389, "Diagnosis Procedure". NO >> INSPECTION END Ν **Diagnosis** Procedure INFOID-000000012406546 Perform the trouble diagnosis for TCS. Refer to BRC-46, "Work Flow". NOTE: If DTC P1212 is displayed with DTC UXXXX and/or P0607, perform the following trouble diagnosis. Trouble diagnosis for DTC UXXXX Refer to EC-103, "DTC Index".

Trouble diagnosis for DTC P0607 Refer to <u>EC-376</u>, "<u>DTC Logic</u>".

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< DTC/CIRCUIT DIAGNOSIS >

P1217 ENGINE OVER TEMPERATURE

DTC Logic

DTC DETECTION LOGIC

NOTE:

- If DTC P1217 is displayed with DTC UXXXX, first perform the trouble diagnosis for DTC UXXXX.
- If DTC P1217 is displayed with DTC P0607, first perform the trouble diagnosis for DTC P0607. Refer to <u>EC-376, "DTC Logic"</u>.

If the cooling fan or another component in the cooling system malfunctions, engine coolant temperature will rise.

When the engine coolant temperature reaches an abnormally high temperature condition, a malfunction is indicated.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1217	Engine over 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 short- ed.) IPDM E/R (Cooling fan relays) Cooling fan motor Radiator hose Radiator Radiator cap Water pump Thermostat

CAUTION:

When a malfunction is indicated, always replace the coolant. Refer to <u>CO-9, "Draining"</u>. Also, replace the engine oil. Refer to <u>MA-17, "ENGINE OIL : Draining"</u>.

- 1. Fill radiator with coolant up to specified level with a filling speed of 2 liters per minute. Always use coolant with the proper mixture ratio. Refer to <u>MA-11, "Anti-Freeze Coolant Mixture Ratio"</u>.
- 2. After refilling coolant, run engine to ensure that no water-flow noise is emitted.

DTC CONFIRMATION PROCEDURE

1.PERFORM COMPONENT FUNCTION CHECK

Perform component function check. Refer to EC-390, "Component Function Check".

NOTE:

Use component function check to check the overall function of the cooling fan. During this check, a DTC might not be confirmed.

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Proceed to <u>EC-391, "Diagnosis Procedure"</u>.

Component Function Check

INFOID:000000012406548

1.PERFORM COMPONENT FUNCTION CHECK-I

WARNING:

Never remove the radiator cap when the engine is hot. Serious burns could be caused by high pressure fluid escaping from the radiator.

Wrap a thick cloth around cap. Carefully remove the cap by turning it a quarter turn to allow built-up pressure to escape. Then turn the cap all the way off.

INFOID:000000012406547

< DTC/CIRCUIT DIAGNOSIS > Check the coolant level in the reservoir tank and radiator. Allow engine to cool before checking coolant level. А Is the coolant level in the reservoir tank and/or radiator below the proper range? YES >> Proceed to EC-391, "Diagnosis Procedure". EC MAX. NO >> GO TO 2. ΟK MIN • SEF621W 2. PERFORM COMPONENT FUNCTION CHECK-II D Confirm whether customer filled the coolant or not. Did customer fill the coolant? Ε YES >> Proceed to EC-391, "Diagnosis Procedure". NO >> GO TO 3. **3.** PERFORM COMPONENT FUNCTION CHECK-III With CONSULT 1. Turn ignition switch ON. Perform "COOLING FAN" in "ACTIVE TEST" mode with CONSULT. Check that cooling fan motors-1 and -2 operate at each speed (LOW/MID/HI). Without CONSULT Perform IPDM E/R auto active test and check cooling fan motors operation, refer to PCS-10, "Diagnosis Н Description". Is the inspection result normal? YES >> INSPECTION END NO >> Proceed to EC-391, "Diagnosis Procedure". Diagnosis Procedure INFOID:000000012406549 **1**.CHECK COOLING FAN OPERATION (I) With CONSULT Κ 1. Turn ignition switch ON. Perform "COOLING FAN" in "ACTIVE TEST" mode with CONSULT. 2. Check that cooling fans-1 and -2 operate at each speed (LOW/MID/HI). 3. **®** Without CONSULT 1. Perform IPDM E/R auto active test and check cooling fan motors operation, refer to PCS-10, "Diagnosis Description". M Check that cooling fans-1 and -2 operate at each speed (Low/Middle/High). Is the inspection result normal? YES >> GO TO 2. Ν NO >> Proceed to EC-470, "Diagnosis Procedure". 2.CHECK COOLING SYSTEM FOR LEAKAGE-I Check cooling system for leakage. Refer to CO-9, "Inspection". Is leakage detected? YES >> GO TO 3. NO >> GO TO 4. Ρ 3.CHECK COOLING SYSTEM FOR LEAKAGE-II Check the following for leakage.

- Hose
- Radiator
- Water pump

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< DTC/CIRCUIT DIAGNOSIS >

>> Repair or replace malfunctioning part.

4.CHECK RADIATOR CAP

Check radiator cap. Refer to CO-13, "RADIATOR CAP : Inspection".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace radiator cap. Refer to <u>CO-14</u>, "Exploded View".

CHECK THERMOSTAT

Check thermostat. Refer to CO-26, "Inspection".

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace thermostat. Refer to <u>CO-25, "Exploded View"</u>.

6.CHECK ENGINE COOLANT TEMPERATURE SENSOR

Check engine coolant temperature sensor. Refer to EC-216, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace engine coolant temperature sensor. Refer to <u>CO-27, "Exploded View"</u>.

7.CHECK MAIN 12 CAUSES

If the cause cannot be isolated, check the following.

Engine	Step	Inspection item	Equipment	Standard	Reference page
OFF	1	 Blocked radiator Blocked condenser Blocked radiator grille Blocked bumper 	• Visual	No blocking	_
	2	Coolant mixture	Coolant tester	CO-9. "Inspection"	
	3	Coolant level	• Visual	Coolant up to MAX level in reservoir tank and radiator filler neck	CO-9, "Inspection"
	4	Radiator cap	Pressure tester	CO-13, "RADIATOR CAP : Inspection"	
ON* ²	5	Coolant leakage	Visual	No leakage	CO-9, "Inspection"
ON* ²	6	Thermostat	Touch the upper and lower radiator hoses	Both hoses should be hot	CO-26, "Inspection"
ON* ¹	7	Cooling fan	CONSULT	Operating	EC-470, "Component Function Check"
OFF	8	Combustion gas leak- age	Color checker chemical tester 4 Gas analyzer	Negative	_
ON* ³	9	Coolant temperature gauge	• Visual	Gauge less than 3/4 when driving	_
		Coolant overflow to res- ervoir tank	• Visual	No overflow during driving and idling	CO-9, "Inspection"
OFF* ⁴	10	Coolant return from res- ervoir tank to radiator	• Visual	Should be initial level in reservoir tank	CO-9, "Inspection"
OFF	11	Cylinder head	 Straight gauge feeler gauge 	0.1 mm (0.004 in) Maxi- mum distortion (warping)	EM-104, "Inspection"
	12	Cylinder block and pis- tons	• Visual	No scuffing on cylinder walls or piston	EM-117, "Inspection"

*1: Turn the ignition switch ON.

*2: Engine running at 3,000 rpm for 10 minutes.

*3: Drive at 90 km/h (56 MPH) for 30 minutes and then let idle for 10 minutes.

*4: After 60 minutes of cool down time.

For more information, refer to CO-3, "Troubleshooting Chart".

< DTC/CIRCUIT DIAGNOSIS >

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>> INSPECTION END	A
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< DTC/CIRCUIT DIAGNOSIS >

P1225 TP SENSOR

DTC Logic

INFOID:000000012406550

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DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1225	Closed throttle position learning performance	Closed throttle position learning value is excessively low.	 Electric throttle control actuator (TP sensor 1 and 2)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

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

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10 V at idle.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- 1. Turn ignition switch ON.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Turn ignition switch ON.
- 4. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to EC-394, "Diagnosis Procedure".
- NO >> INSPECTION END

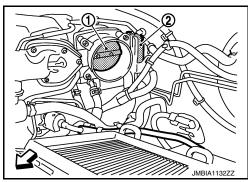
Diagnosis Procedure

1. CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

- 1. Turn ignition switch OFF.
- 2. Remove the intake air duct. Refer to EM-27, "Exploded View".
- 3. Check if foreign matter is caught between the throttle valve (1) and the housing.
- Electric throttle control actuator (2)
- <a>: Vehicle front

Is the inspection result normal?

- YES >> GO TO 2.
- NO >> Remove the foreign matter and clean the electric throttle control actuator inside, and then perform throttle valve closed position learning. Refer to <u>EC-148, "Description"</u>.



2.REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

- 1. Replace electric throttle control actuator. Refer to EM-29. "Exploded View".
- 2. Go to EC-149, "Description".

>> INSPECTION END

INFOID:000000012406551

P1226 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P1226 TP SENSOR

DTC Logic

INFOID:000000012406552

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DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1226	Closed throttle position learning performance	Closed throttle position learning is not per- formed successfully, repeatedly.	Electric throttle control actuator (TP sensor 1 and 2)
IC CON	FIRMATION PROCI	EDURE	
.PRECO	NDITIONING		
DTC Con	firmation Procedure h	as been previously conducted, alway	s perform the following before conduct
g the nex	t test.		
	nition switch OFF and nition switch ON.	l wait at least 10 seconds.	
. Turn ig	nition switch OFF and	l wait at least 10 seconds.	
	CONDITION: forming the followin	g procedure, confirm that battery v	voltage is more than 10 V at idle.
		,	
>>	GO TO 2.		
.PERFO	RM DTC CONFIRMAT	TION PROCEDURE	
	nition switch ON.		
	nition switch OFF and nition switch ON.	l wait at least 10 seconds.	
. Repeat	t steps 2 and 3 for 32	times.	
	1st trip DTC.		
•	TC detected?	"Diagnosis Procedure"	
	INSPECTION END	"Diagnosis Procedure".	
iagnosi	s Procedure		INFQID:00000001240655
-			
		LE CONTROL ACTUATOR VISUALL	Y
	nition switch OFF. The intake air duct	Refer to EM-27, "Exploded View".	
. Check	if foreign matter is ca	aught between the throttle valve (1)	
	e housing. c throttle control actua	tor (2)	
	nicle front		
	ection result normal?		
	GO TO 2.		
NO >>		matter and clean the electric throttle de, and then perform throttle valve	
		ing. Refer to <u>EC-148, "Description"</u> .	
			JMBIA1132ZZ
.REPLAC	CE ELECTRIC THRO	TTLE CONTROL ACTUATOR	
		rol actuator. Refer to EM-29, "Explode	a al N C a confl

- 1. Replace electric throttle control actuator. Refer to <u>EM-29, "Exploded View"</u>.
- 2. Go to EC-149, "Description".

>> INSPECTION END

< DTC/CIRCUIT DIAGNOSIS >

P1550 BATTERY CURRENT SENSOR

DTC Logic

INFOID:000000012406554

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1550	Battery current sensor circuit range/performance	The output voltage of the battery current sensor remains within the specified range while engine is running.	 Harness or connectors (Battery current sensor circuit is open or shorted.) (APP sensor 2 circuit is shorted.) [CMP sensor (PHASE) circuit is or shorted.] (EOP sensor circuit is shorted.) (Refrigerant pressure sensor is short- ed.) Battery current sensor Accelerator pedal position sensor Camshaft position sensor (PHASE) Engine oil pressure sensor Refrigerant pressure sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

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

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 8 V at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine and wait at least 10 seconds.
- 2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to EC-396, "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000012406555

1. CHECK BATTERY CURRENT SENSOR POWER SUPPLY

- 1. Disconnect battery current sensor harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between battery current sensor harness connector and ground.

Battery cur	rrent sensor	Ground	Voltage (V)
Connector	Terminal		
F76	1	Ground	Approx. 5

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2. CHECK BATTERY CURRENT SENSOR POWER SUPPLY CIRCUIT FOR OPEN

1. Turn ignition switch OFF.

Revision: October 2015

EC-396

P1550 BATTERY CURRENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

2. Disconnect ECM harness connector.

3. Check the continuity between battery current sensor harness connector and ECM harness connector.

Connector	rrent sensor	E	CM	Continuity	
	Terminal	Connector	Terminal	Continuity	
F76	1	F15	87	Existed	
the inspectic	on result normal	?			
ES >> Ch	eck sensor pov	ver supply 2 cir	cuit. Refer to	C-497, "Diagnosis Procee	<u>dure"</u> .
	epair or replace		•		
CHECK BA	FTERY CURRE	ENT SENSOR	GROUND CIR	CUIT FOR OPEN AND SH	IORT
	on switch OFF.				
	t ECM harness		rent sensor ha	rness connector and ECM	I harness connector
Oneok the	continuity betw	cen battery cu			
Battery cur	rrent sensor	EC	CM		
Connector	Terminal	Connector	Terminal	Continuity	
F76	3	F15	64	Existed	
Also check	harness for sh	ort to ground a	nd short to po	ver	
	on result normal	•			
	D TO 4.				
		it, short to grou	ind or short to	power in harness or conne	ectors.
CHECK BA	TTERY CURRE	ENT SENSOR I	NPUT SIGNA	CIRCUIT FOR OPEN A	ND SHORT
				rness connector and ECN	
	continuity betw	cerr ballery cu			
	rent sensor	EC	CM		
Batterv cur					
Battery cur	Terminal	Connector	Terminal	Continuity	
Connector	Terminal 4	Connector E15	Terminal		
Connector F76	4	F15	69	Existed	
Connector F76 Also check	4 c harness for sh	F15 lort to ground a	69	Existed	
Connector F76 Also check the inspectio	4 c harness for sh on result norma	F15 lort to ground a	69	Existed	
Connector F76 Also check the inspectio 'ES >> G0	4 c harness for sh on result norma O TO 5.	F15 fort to ground a l?	69 nd short to po	Existed ver.	ectors.
Connector F76 Also check the inspectio (ES >> GO NO >> Re	4 c harness for sh on result normal O TO 5. epair open circu	F15 F15 F15 F15 F15 F15 F15 F15 F15 F15	69 nd short to po	Existed	ectors.
Connector F76 Also check the inspectio (ES >> GO NO >> Re .CHECK BA	4 c harness for sh on result normal O TO 5. epair open circu TTERY CURRE	F15 fort to ground a l? it, short to grou ENT SENSOR	69 nd short to po Ind or short to	Existed ver. power in harness or conne	ectors.
Connector F76 Also check the inspectio (ES >> GC NO >> Re .CHECK BA neck battery	4 c harness for sh on result normal O TO 5. epair open circu TTERY CURRE current sensor.	F15 F15 F15 F15 F15 F15 F15 F15 F15 F15	69 nd short to po Ind or short to	Existed ver. power in harness or conne	ectors.
Connector F76 Also check the inspectio (ES >> GC (ES >> GC NO >> Re .CHECK BA neck battery the inspectio	4 c harness for sh on result norma O TO 5. epair open circu TTERY CURRE current sensor. on result norma	F15 F15 F15 F15 F15 F15 F15 F15 F15 F15	69 nd short to por and or short to 07, "Componer	Existed ver. bower in harness or conne	ectors.
Connector F76 Also check the inspectio (ES >> GO NO >> Re .CHECK BA heck battery the inspectio (ES >> Ch	4 c harness for shon result normal D TO 5. epair open circu TTERY CURRE current sensor. on result normal neck intermitten	F15 F15 F15 F15 F15 F15 F15 F15 F15 F15	69 nd short to por and or short to 97, "Componer r to <u>GI-41, "Int</u>	Existed ver. power in harness or conne	ectors.
Connector F76 Also check the inspection (ES >> GO NO >> Ref .CHECK BAT heck battery of the inspection (ES >> Ch NO >> Ref NO >> Ref	4 c harness for short on result normal O TO 5. epair open circu TTERY CURRE current sensor. on result normal neck intermitten eplace battery n	F15 F15 F15 F15 F15 F15 F15 F15 F15 F15	69 nd short to por and or short to 97, "Componer r to <u>GI-41, "Int</u>	Existed ver. bower in harness or conne	ectors.
Connector F76 Also check the inspection (ES >> GO NO >> Ref .CHECK BAT heck battery of the inspection (ES >> Ch NO >> Ref NO >> Ref	4 c harness for shon result normal D TO 5. epair open circu TTERY CURRE current sensor. on result normal neck intermitten	F15 F15 F15 F15 F15 F15 F15 F15 F15 F15	69 nd short to por and or short to 97, "Componer r to <u>GI-41, "Int</u>	Existed ver. bower in harness or conne	
Connector F76 Also check the inspectio (ES >> GO NO >> Re .CHECK BA heck battery the inspectio (ES >> Ch NO >> Re omponent	4 c harness for shon result normal O TO 5. cpair open circu TTERY CURRE current sensor. on result normal neck intermitten cplace battery normal conterplace battery normal	F15 F15 F15 F15 F15 F15 F15 F15 F15 F15	69 nd short to por and or short to 97, "Componer r to <u>GI-41, "Int</u>	Existed ver. bower in harness or conne	ectors.
Connector F76 Also check the inspectio (ES >> GO NO >> Re .CHECK BA heck battery the inspectio (ES >> Ch NO >> Re omponent .CHECK BA	4 c harness for shon result normal O TO 5. epair open circu TTERY CURRE current sensor. on result normal eplace battery normal place battery normal cinspection	F15 F15 F15 F15 F15 F15 F15 F15 F15 F15	69 nd short to por and or short to 97, "Componer r to <u>GI-41, "Int</u>	Existed ver. bower in harness or conne	
Connector F76 Also check the inspectio (ES >> GC O >> Re CHECK BA Deck battery the inspectio (ES >> Ch O >> Re Omponent .CHECK BA Turn ignitio	4 c harness for shon result normal O TO 5. cpair open circu TTERY CURRE current sensor. on result normal neck intermitten cplace battery normal conterplace battery normal	F15 F15 F15 F15 F15 F15 F15 F15 F15 F15	69 nd short to por and or short to <u>97, "Componer</u> r to <u>GI-41, "Int</u> assembly.	Existed ver. bower in harness or conne	

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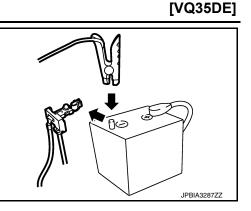
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P1550 BATTERY CURRENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

- 3. Disconnect battery negative cable.
- 4. Install jumper cable between battery negative terminal and body ground.
- 5. Turn ignition switch ON.
- 6. Check the voltage between ECM harness connector terminals under the following conditions.

	ECM		
Connector	+	_	Voltage (V)
Connector	Terminal	Terminal	
F15	69 (Battery current sensor signal)	64 (Sensor ground)	Approx. 2.5



Before measuring the terminal voltage, confirm that the battery is fully charged. Refer to PG-128, "How to Handle Battery".

- Is the inspection result normal?
- YES >> INSPECTION END
- NO >> Replace battery negative cable assembly.

P1551, P1552 BATTERY CURRENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P1551, P1552 BATTERY CURRENT SENSOR

DTC Logic

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INFOID:000000012406557

[VQ35DE]

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1551	Battery current sensor circuit low input	An excessively low voltage from the sensor is sent to ECM.	Harness or connectors (Battery current sensor circuit is open or shorted)
P1552	Battery current sensor circuit high input	An excessively high voltage from the sen- sor is sent to ECM.	or shorted.) (APP sensor 2 circuit is shorted.) [CMP sensor (PHASE) circuit is or shorted.] (EOP sensor circuit is shorted.) (Refrigerant pressure sensor is short- ed.) • Battery current sensor • Accelerator pedal position sensor • Camshaft position sensor (PHASE) • Engine oil pressure sensor • Refrigerant pressure sensor

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following before conduct-	Н
ing the next test.	
1. Turn ignition switch OFF and wait at least 10 seconds.	
2 Turn ignition switch ON	

2. Turn ignition switch ON.

3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 8 V with ignition switch ON

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

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

2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to EC-399, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1.CHECK BATTERY CURRENT SENSOR POWER SUPPLY

1. Disconnect battery current sensor harness connector.

2. Turn ignition switch ON.

3. Check the voltage between battery current sensor harness connector and ground.

-	Battery cur	rrent sensor	Ground	Voltage (V)
-	Connector	Terminal	Ground	voltage (v)
-	F76	1	Ground	Approx. 5

Is the inspection result normal?

YES >> GO TO 3.

2. CHECK BATTERY CURRENT SENSOR POWER SUPPLY CIRCUIT FOR OPEN

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INFOID:000000012406558

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P1551, P1552 BATTERY CURRENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check the continuity between battery current sensor harness connector and ECM harness connector.

Battery cu	rrent sensor	E	CM	Continuity
Connector	Terminal	Connector	Terminal	Continuity
F76	1	F15	87	Existed

Is the inspection result normal?

YES >> Check sensor power supply 2 circuit. Refer to EC-497, "Diagnosis Procedure".

NO >> Repair or replace error-detected parts.

 $\mathbf{3}.$ CHECK BATTERY CURRENT SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.

2. Disconnect ECM harness connector.

3. Check the continuity between battery current sensor harness connector and ECM harness connector.

Battery cur	rrent sensor	E	CM	Continuity
Connector	Terminal	Connector	Terminal	Continuity
F76	3	F15	64	Existed

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

Is the inspection result normal?

YES >> GO TO 4.

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

4.CHECK BATTERY CURRENT SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between battery current sensor harness connector and ECM harness connector.

Battery cur	rent sensor	E	СМ	Continuity
Connector	Terminal	Connector	Terminal	Continuity
F76	4	F15	69	Existed

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

Is the inspection result normal?

YES >> GO TO 5.

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

5.CHECK BATTERY CURRENT SENSOR

Check battery current sensor. Refer to EC-397, "Component Inspection".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".

NO >> Replace battery negative cable assembly.

Component Inspection

INFOID:000000012406559

1.CHECK BATTERY CURRENT SENSOR

1. Turn ignition switch OFF.

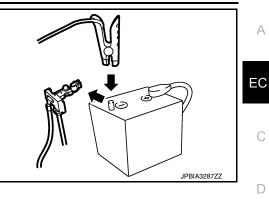
2. Reconnect harness connectors disconnected.

P1551, P1552 BATTERY CURRENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

- 3. Disconnect battery negative cable.
- 4. Install jumper cable between battery negative terminal and body ground.
- 5. Turn ignition switch ON.
- 6. Check the voltage between ECM harness connector terminals under the following conditions.

	ECM		
Connector	+	_	Voltage (V)
Connector	Terminal	Terminal	
F15	69 (Battery current sensor signal)	64 (Sensor ground)	Approx. 2.5



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Before measuring the terminal voltage, confirm that the battery is fully charged. Refer to PG-128, "How to Handle Battery".

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Replace battery negative cable assembly.

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< DTC/CIRCUIT DIAGNOSIS >

P1553 BATTERY CURRENT SENSOR

DTC Logic

INFOID:000000012406560

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1553	Battery current sensor perfor- mance	The signal voltage transmitted from the sensor to ECM is higher than the amount of the maximum power generation.	 Harness or connectors (Battery current sensor circuit is open or shorted.) (APP sensor 2 circuit is shorted.) [CMP sensor (PHASE) circuit is or shorted.] (EOP sensor circuit is shorted.) (Refrigerant pressure sensor is short- ed.) Battery current sensor Accelerator pedal position sensor Camshaft position sensor (PHASE) Engine oil pressure sensor Refrigerant pressure sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

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

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 8 V at idle.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine and wait at least 10 seconds.
- 2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to <u>EC-402</u>, "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000012406561

1. CHECK BATTERY CURRENT SENSOR POWER SUPPLY

- 1. Disconnect battery current sensor harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between battery current sensor harness connector and ground.

Battery cur	rrent sensor	Ground	Voltage (V)
Connector	Terminal	Ground	voltage (v)
F76	1	Ground	Approx. 5

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2. CHECK BATTERY CURRENT SENSOR POWER SUPPLY CIRCUIT FOR OPEN

1. Turn ignition switch OFF.

Revision: October 2015

EC-402

P1553 BATTERY CURRENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

2. Disconnect ECM harness connector.

3. Check the continuity between battery current sensor harness connector and ECM harness connector.

Connector Terminal Connector Terminal F76 1 F15 87 Existed Ithe inspection result normal? YES >> Check sensor power supply 2 circuit. Refer to EC-497. "Diagnosis Procedure". NO >> Repair or replace error-detected parts.	Battery cu	rrent sensor	E	СМ	Continuity	
Ite inspection result normal? YES >> Check sensor power supply 2 circuit. Refer to EC-497, "Diagnosis Procedure". NO >> Repair or replace error-detected parts. CHECK BATTERY CURRENT SENSOR GROUND CIRCUIT FOR OPEN AND SHORT Turn ignition switch OFF. Disconnect ECM harness connector. Check the continuity between battery current sensor harness connector and ECM harness connector. Battery current sensor ECM Connector Terminal Connector So foo 4. NO >> Repair open circuit, short to ground or short to power in harness or connectors. -CHECK BATTERY CURRENT SENSOR Continuity Connector Termina	Connector	Terminal	Connector	Terminal	Continuity	
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NO >> Repair open circuit, short to ground or short to power in harness or connectors. D.CHECK BATTERY CURRENT SENSOR Check battery current sensor. Refer to EC-397, "Component Inspection". <u>s the inspection result normal?</u> YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident". NO >> Replace battery negative cable assembly. Component Inspection .CHECK BATTERY CURRENT SENSOR . CHECK BATTERY CURRENT SENSOR	Check the Battery cur Connector F76 Also check	continuity betw rrent sensor Terminal 4 c harness for sh	veen battery cur EC Connector F15 nort to ground a	rrent sensor ha CM Terminal 69	Continuity Existed	
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	Check the Battery cur Connector F76 Also check the inspectio (ES >> GC IO >> Re CHECK BA heck battery the inspectio (ES >> Ch CS >> Ch S >> Ch NO >> Re Omponent	continuity betw rent sensor Terminal 4 c harness for sh on result norma O TO 5. epair open circu TTERY CURRE current sensor. on result norma neck intermitten eplace battery n Inspection	reen battery cur EC Connector F15 nort to ground a I? hit, short to ground a I? NT SENSOR Refer to <u>EC-39</u> I? t incident. Refer regative cable a	rrent sensor ha	Continuity Existed wer. power in harnes	r and ECM harness connector.
	Check the Battery cur Connector F76 Also check the inspectio (ES >> GC IO >> Re CHECK BA heck battery (ES >> Ch IO >> Re Omponent CHECK BA	continuity betw rent sensor Terminal 4 c harness for sh on result norma O TO 5. epair open circu TTERY CURRE current sensor. on result norma heck intermitten eplace battery n Inspection	reen battery cur EC Connector F15 nort to ground a I? hit, short to ground a I? NT SENSOR Refer to <u>EC-39</u> I? t incident. Refer regative cable a	rrent sensor ha	Continuity Existed wer. power in harnes	r and ECM harness connector.
	Check the Battery cur Connector F76 Also check the inspectio (ES >> GC IO >> Re CHECK BA (ES >> Ch CHECK BA (ES >> Ch IO >> Re Omponent CHECK BA	continuity betw rent sensor Terminal 4 c harness for sh on result norma O TO 5. epair open circu TTERY CURRE current sensor. on result norma heck intermitten eplace battery n Inspection TTERY CURRE on switch OFF.	reen battery cur EC Connector F15 nort to ground a I? NT SENSOR Refer to EC-39 I? t incident. Refer tegative cable a	rrent sensor ha	Continuity Existed wer. power in harnes	r and ECM harness connector.

[VQ35DE]

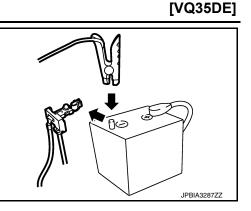
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P1553 BATTERY CURRENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

- 3. Disconnect battery negative cable.
- 4. Install jumper cable between battery negative terminal and body ground.
- 5. Turn ignition switch ON.
- 6. Check the voltage between ECM harness connector terminals under the following conditions.

Connector	+	_	Voltage (V)
Connector	Terminal	Terminal	
F15	69 (Battery current sensor signal)	64 (Sensor ground)	Approx. 2.5



Before measuring the terminal voltage, confirm that the battery is fully charged. Refer to PG-128, "How to Handle Battery".

- Is the inspection result normal?
- YES >> INSPECTION END
- NO >> Replace battery negative cable assembly.

P1554 BATTERY CURRENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P1554 BATTERY CURRENT SENSOR

DTC Logic

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1554	Battery current sensor perfor- mance	The output voltage of the battery current sensor is lower than the specified value while the battery voltage is high enough.	 Harness or connectors (Battery current sensor circuit is open or shorted.) (APP sensor 2 circuit is shorted.) [CMP sensor (PHASE) circuit is or shorted.] (EOP sensor circuit is shorted.) (Refrigerant pressure sensor is short- ed.) Battery current sensor Accelerator pedal position sensor Camshaft position sensor (PHASE) Engine oil pressure sensor Refrigerant pressure sensor
DTC CONF	IRMATION PROCEDUR	E	
1.PERFOR	M COMPONENT FUNCTIO	ON CHECK	
	ponent function check. Ref	er to EC-405, "Component Functio	n Check".
			/ current sensor circuit. During this
	trip DTC might not be confi	rmed.	
	<u>ction result normal?</u> INSPECTION END		
	Proceed to <u>EC-406, "Diagn</u>	osis Procedure".	
Compone	nt Function Check		INFOID:000000012406564
1.PRECON	IDITIONING		
Before pe OFF.	rforming the following pro	ocedure, confirm that battery vol ocedure, confirm that all load sw	tage is more than 12.8 V at idle. itches and A/C switch are turned
~	M COMPONENT FUNCTIO	ON CHECK	
2. Select "	gine and let it idle.	ONITOR" mode with CONSULT. or 10 seconds.	
	UR SEN" should be above		
1. Start en	gine and let it idle.	ess connector terminals under the fo	bllowing conditions.

INFOID:000000012406563

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EC

P1554 BATTERY CURRENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

	ECM		
Connector	+	-	Voltage (V)
Connector	Terminal	Terminal	
F8	69 (Battery current sensor signal)	64 (Sensor ground)	Above 2.3 at least once
Is the inspect	ion result norma		

YES >> INSPECTION END

NO >> Proceed to EC-406, "Diagnosis Procedure"

Diagnosis Procedure

INFOID:000000012406565

1. CHECK BATTERY CURRENT SENSOR POWER SUPPLY

- 1. Disconnect battery current sensor harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between battery current sensor harness connector and ground.

Ground	Voltage (V)	
Ground	voltage (v)	
Ground	Approx. 5	

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2. CHECK BATTERY CURRENT SENSOR POWER SUPPLY CIRCUIT FOR OPEN

1. Turn ignition switch OFF.

2. Disconnect ECM harness connector.

3. Check the continuity between battery current sensor harness connector and ECM harness connector.

 Battery current sensor		ECM		Continuity
 Connector	Terminal	Connector	Terminal	Continuity
 F76	1	F15	87	Existed

Is the inspection result normal?

YES >> Check sensor power supply 2 circuit. Refer to EC-497, "Diagnosis Procedure".

NO >> Repair or replace error-detected parts.

 ${f 3}.$ CHECK BATTERY CURRENT SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.

2. Disconnect ECM harness connector.

3. Check the continuity between battery current sensor harness connector and ECM harness connector.

Battery cur	rrent sensor	ECM		Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
F76	3	F15	64	Existed	

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

Is the inspection result normal?

YES >> GO TO 4.

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

4.CHECK BATTERY CURRENT SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between battery current sensor harness connector and ECM harness connector.

P1554 BATTERY CURRENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

Battery curr	ent sensor	ECM				А
Connector	Terminal	Connector	Terminal	Continuity		
F76	4	F15	69	Existed		EC
s the inspection YES >> GO NO >> Rep D.CHECK BAT Check battery c s the inspection YES >> Che	n result normal? TO 5. Dair open circuit, TERY CURREN urrent sensor. R n result normal? eck intermittent i blace battery ne	, short to ground NT SENSOR Refer to <u>EC-407.</u>	or short to p <u>"Component"</u> G <u>GI-41, "Inte</u>	ower in harness or o	connectors.	C
		IT SENSOR				F
2. Reconnect		tors disconnecte	ed.			G
 Install jump ground. Turn ignitio Check the 	n switch ON.	n battery negati n ECM harness				H
	ECM			-))		
Connector	+ Terminal	– Terminal	Voltage (V)		JPBIA3287ZZ	J
F15	69 (Battery current sensor signal)	64 (Sensor ground)	Approx. 2.5			K
Before measu	ring the terminal vol	ltage, confirm that th	ne battery is fully	charged. Refer to PG-1	28, "How to Handle Battery".	
•	n result normal?					L
	DECTION END	gative cable ass	embly.			Ν
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P1556, P1557 BATTERY TEMPERATURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P1556, P1557 BATTERY TEMPERATURE SENSOR

DTC Logic

INFOID:000000012406567

[VQ35DE]

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name (Trouble diagnosis content)	DTC detecting condition	Possible cause
P1556	BAT TMP SEN/CIRC (Battery temperature sensor cir- cuit low input)	Signal voltage from Battery temperature sensor remains 0.16V or less for 5 seconds or more.	Harness or connectors [Battery current sensor (Battery tem- perature sensor) circuit is open or
P1557	BAT TMP SEN/CIRC (Battery temperature sensor cir- cuit high input)	Signal voltage from Battery temperature sensor remains 4.84V or more for 5 sec- onds or more.	 shorted.] (APP sensor 2 circuit is shorted.) [CMP sensor (PAHSE) circuit is open or shorted.] (EOP sensor is shorted.) (Refrigerant pressure sensor is shorted.) (Refrigerant pressure sensor is shorted.) Battery current sensor (Battery temperature sensor) Accelerator pedal position sensor (APP sensor 2) Camshaft position (CMP) sensor (PHESE) Engine oil temperature (EOP) sensor Refrigerant pressure sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

2. Turn ignition switch ON.

3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is 10 V or more at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

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

Is 1st trip DTC detected?

YES >> Proceed to <u>EC-408</u>, "Diagnosis Procedure". NO >> INSPECTION END

Diagnosis Procedure

1.CHECK BATTERY TEMPERATURE SENSOR INPUT SIGNAL

1. Disconnect battery current sensor harness connector.

- 2. Turn ignition switch ON.
- 3. Check the voltage between battery current sensor harness connector and ground.

Battery cur	rent sensor	Ground	Voltage (V)	
Connector	Terminal	Giouna	voltage (v)	
F76	2	Ground	Approx. 5	

Is the inspection result normal?

YES >> GO TO 3. NO >> GO TO 2. INFOID:000000012406568

P1556, P1557 BATTERY TEMPERATURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

$\overline{2}$. CHECK BATTERY TEMPERATURE SENSOR INPUT SIGNAL CIRCUIT FOR OPEN А 1. Turn ignition switch OFF. Disconnect ECM harness connector. 2. 3. Check the continuity between battery current sensor harness connector and ECM harness connector. EC Battery current sensor ECM Continuity Connector Terminal Connector Terminal 2 F15 F76 68 Existed 4. Also check harness for short to ground and short to power. D Is the inspection result normal? YES >> Check sensor power supply 2 circuit. Refer to EC-497, "Diagnosis Procedure". NO >> Repair or replace error-detected parts. Ε ${f 3.}$ CHECK BATTERY TEMPERATURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT 1. Turn ignition switch OFF. 2. Disconnect ECM harness connector. 3. Check the continuity between battery current sensor harness connector and ECM harness connector. ECM Battery current sensor Continuity Connector Terminal Connector Terminal F76 3 F15 64 Existed Н Is the inspection result normal? YES >> GO TO 4. NO >> Repair open circuit, short to ground or short to power in harness or connectors. ${f 4}$. CHECK BATTERY TEMPERATURE SENSOR Check battery temperature sensor. Refer to EC-409, "Component Inspection (Battery Temperature Sensor)". Is the inspection result normal? YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident". NO >> Replace battery negative cable assembly. Κ Component Inspection (Battery Temperature Sensor) INFOID:000000012406569 1.CHECK BATTERY TEMPERATURE SENSOR 1. Turn ignition switch OFF. 2. Disconnect battery current sensor. 3. Check the resistance between battery current sensor connector terminals. M Battery current sensor + Resistance Ν Terminal continuity with the resis-2 3 tance value 100Ω or more Is the inspection result normal? YES >> INSPECTION END Ρ NO >> Replace battery negative cable assembly.

P1564 ASCD STEERING SWITCH

< DTC/CIRCUIT DIAGNOSIS >

P1564 ASCD STEERING SWITCH

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P1564 is displayed with DTC P0605, first perform the trouble diagnosis for DTC P0605. Refer to <u>EC-374, "DTC Logic"</u>.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1564	ASCD steering switch	 An excessively high voltage signal from the ASCD steering switch is sent to ECM. ECM detects that input signal from the ASCD steering switch is out of the specified range. ECM detects that the ASCD steering switch is stuck ON. 	 Harness or connectors (The switch circuit is open or shorted.) ASCD steering switch ECM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

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

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- 1. Turn ignition switch ON and wait at least 10 seconds.
- 2. Press MAIN switch for at least 10 seconds, then release it and wait at least 10 seconds.
- 3. Press CANCEL switch for at least 10 seconds, then release it and wait at least 10 seconds.
- Press RESUME/ACCELERATE switch for at least 10 seconds, then release it and wait at least 10 seconds.
- 5. Press SET/COAST switch for at least 10 seconds, then release it and wait at least 10 seconds.
- 6. Check DTC.

Is DTC detected?

YES >> Proceed to EC-410, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000012406571

1. CHECK ASCD STEERING SWITCH CIRCUIT

() With CONSULT

- 1. Turn ignition switch ON.
- 2. Select "MAIN SW", "CANCEL SW", "RESUME/ACC SW" and "SET SW" in "DATA MONITOR" mode with CONSULT.
- 3. Check each item indication under the following conditions.

Monitor item	Condition		Indication
MAIN SW	MAIN switch	Pressed	ON
MAIN SW	MAIN SWICH	Released	OFF
CANCEL SW	CANCEL switch	Pressed	ON
		Released	OFF

P1564 ASCD STEERING SWITCH

< DTC/CIRCUIT DIAGNOSIS >

Monitor item	Condition		Indication
RESUME/ACC SW	RESUME/ACCEL-	Pressed	ON
	ERATE switch	Released	OFF
SET SW	SET/COAST switch	Pressed	ON
OLT OW		Released	OFF

Without CONSULT

1. Turn ignition switch ON.

2. Check the voltage between ECM harness connector terminals under the following conditions.

	ECM			
Con-	+	_	Condition	Voltage (V)
nector	Terminal	Terminal		
			MAIN switch: Pressed	Approx. 0
	134	135	CANCEL switch: Pressed	Approx. 1
E19	(ASCD steering switch	(ASCD steering switch	SET/COAST switch: Pressed	Approx. 2
	signal)	ground)	RESUME/ACCELERATE switch: Pressed	Approx. 3
			All ASCD steering switches: Released	Approx. 4

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".

NO >> GO TO 2.

2. CHECK ASCD STEERING SWITCH GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector M303.
- 3. Disconnect combination switch harness connector.
- 4. Check the continuity between combination switch and ECM harness connector.

Combination switch	E	CM	Continuity
Terminal	Connector	Terminal	Continuity
16	E19	135	Existed

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

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

 $\mathbf{3}.$ CHECK ASCD STEERING SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between combination switch and ECM harness connector.

Combination switch	E	CM	Continuity	
Terminal	Connector	Terminal	Continuity	
13	E19	134	Existed	

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

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK ASCD STEERING SWITCH

Check ASCD steering switch. Refer to EC-412, "Component Inspection".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41. "Intermittent Incident".

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P1564 ASCD STEERING SWITCH

< DTC/CIRCUIT DIAGNOSIS >

NO >> Replace ASCD steering switch. Refer to <u>EC-17. "ENGINE CONTROL SYSTEM : Component</u> <u>Parts Location"</u>.

Component Inspection

INFOID:000000012406572

[VQ35DE]

1. CHECK ASCD STEERING SWITCH

- 1. Turn ignition switch OFF.
- 2. Disconnect combination switch (spiral cable) harness connector.
- 3. Check resistance between combination switch harness connector terminals as per the following.

Combinat	ion switch	Condition	Resistance (Ω)
Connector	Terminals	Condition	
		MAIN switch: Pressed	Approx. 0
		CANCEL switch: Pressed	Approx. 250
M33	13 and 16	SET/COAST switch: Pressed	Approx. 660
		RESUME/ACCELERATE switch: Pressed	Approx. 1,480
		All ASCD steering switches: Released	Approx. 4,000

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace ASCD steering switch

< DTC/CIRCUIT DIAGNOSIS >

P1572 BRAKE PEDAL POSITION SWITCH

Description

When the brake pedal is depressed, brake pedal position 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-46</u>, "<u>AUTOMATIC SPEED CONTROL DEVICE (ASCD)</u> : <u>System Description</u>" for the ASCD function.

DTC Logic

DTC DETECTION LOGIC

NOTE:

- If DTC P1572 is displayed with DTC P0605, first perform the trouble diagnosis for DTC P0605. Refer to <u>EC-374, "DTC Logic"</u>.
- This self-diagnosis has the one trip detection logic. When malfunction A is detected, DTC is not stored in ECM memory. And in that case, 1st trip DTC and 1st trip freeze frame data are displayed.
 1st trip DTC is erased when ignition switch 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	G
		A)	When the vehicle speed is above 30 km/h (19 MPH), ON signals from the stop lamp switch and the brake pedal position switch are sent to the ECM at the same time.	 Harness or connectors (The stop lamp switch circuit is shorted.) Harness or connectors (The brake pedal position switch circuit is reported.) 	Н
P1572	Brake pedal posi- tion switch	B)	Brake pedal position switch signal is not sent to ECM for extremely long time while the vehicle is driving.	 shorted.) Stop lamp switch Brake pedal position switch Incorrect stop lamp switch installation Incorrect brake pedal position switch installation ECM 	l

DTC CONFIRMATION PROCEDURE

1.INSPECTION START

Do you have CONSULT?

Do you have CONSULT?

YES	>> GO TO 2.
NO	>> GO TO 5.

2. PRECONDITIONING

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

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.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION A-I

- 1. Start engine (VDC switch OFF).
- 2. Select "DATA MONITOR" mode with CONSULT.
- 3. Press MAIN switch and make sure that CRUISE lamp lights up.
- 4. Drive the vehicle for at least 5 consecutive seconds under the following conditions. CAUTION:

Always drive vehicle at a safe speed. NOTE: INFOID:000000012406573

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< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

This procedure may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

VHCL SPEED SE	More than 30 km/h (19 mph)
Selector lever	Suitable position

5. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-415, "Diagnosis Procedure".

NO >> GO TO 4.

4.PERFORM DTC CONFIRMATION PROCEDURE A-II

1. Drive the vehicle for at least 5 consecutive seconds under the following conditions. **CAUTION:**

Always drive vehicle at a safe speed. NOTE:

This procedure may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

VHCL SPEED SE	More than 30 km/h (19 mph)
Selector lever	Suitable position
Driving location	Depress the brake pedal for more than five seconds so as not to come off from the above-mentioned vehicle speed.

2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to EC-415, "Diagnosis Procedure".

NO >> INSPECTION END

5.PERFORM COMPONENT FUNCTION CHECK

Perform component function check. Refer to EC-414, "Component Function Check".

NOTE:

Use component function check to check the overall function of brake pedal position switch. During this check, a DTC might not be confirmed.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to EC-415. "Diagnosis Procedure".

Component Function Check

1.PERFORM COMPONENT FUNCTION CHECK

- 1. Turn ignition switch ON.
- 2. Check the voltage between ECM harness connectors.

	ECM				
Con-	+	-	Condition	n	Voltage
nector	Terminal	Terminal			
	140 (Brake			Slightly depressed	Approx. 0 V
E19	pedal po- sition switch signal)	152	Brake pedal	Fully re- leased	Battery voltage

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

INFOID:000000012406575

< DTC/CIRCUIT DIAGNOSIS >

2.PERFORM COMPONENT FUNCTION CHECK-II

Check the voltage between ECM harness connectors.

E	ECM				
Con- +	+	_	Conditi	ion	Voltage
nector Term	ninal	Terminal			
(Ste	39 top	150	.	Slightly depressed	Battery voltage
	mp itch nal)	152	Brake pedal	Fully re- leased	Approx. 0 V

YES >> INSPECTION END

NO >> Go to EC-415. "Diagnosis Procedure".

Diagnosis Procedure

1.CHECK OVERALL FUNCTION-I

(I) With CONSULT

- 1. Turn ignition switch ON.
- 2. Select "BRAKE SW1" in "DATA MONITOR" mode with CONSULT.
- 3. Check "BRAKE SW1" indication under the following conditions.

Monitor item	Condition		Indication
BRAKE SW1	Brake pedal	Slightly depressed	OFF
BRARE SWI	Diake pedal	Fully released	ON

Without CONSULT

- 1. Turn ignition switch ON.
- 2. Check the voltage between ECM harness connectors.

ECM						
Con-	+	-	Condition		Voltage	
nector	Terminal	Terminal	•			
	140 (Brake			Slightly depressed	Approx. 0 V	
E19	pedal po- sition switch signal)	152	Brake pedal	Fully re- leased	Battery voltage	

Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 3.

2. CHECK OVERALL FUNCTION-II

With CONSULT

Check "BRAKE SW2" indication in "DATA MONITOR" mode.

Monitor item	Condition	Indication	
BRAKE SW2	Brake pedal	Slightly depressed	ON
		Fully released	OFF

Without CONSULT

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< DTC/CIRCUIT DIAGNOSIS >

Check the voltage between ECM harness connectors.

ECM					
Con-	+	_	Condition		Voltage
nector	Terminal	Terminal			
	139 (Stop	450	5	Slightly depressed	Battery voltage
E19	lamp switch signal)	152	Brake pedal	Fully re- leased	Approx. 0 V

Is the inspection result normal?

YES >> GO TO 11.

NO >> GO TO 7.

3.CHECK BRAKE PEDAL POSITION SWITCH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.

2. Disconnect brake pedal position switch harness connector.

- 3. Turn ignition switch ON.
- 4. Check the voltage between brake pedal position switch harness connector and ground.

Brake pedal position switch		Ground	Voltage	
Connector	Terminal	Cround	Voltage	
E109	1	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4.DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E100
- 10 A fuse (No. 3)
- Harness for open or short between brake pedal position switch and fuse
 - >> Repair open circuit, short to ground or short to power in harness or connectors.

5. CHECK BRAKE PEDAL POSITION SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check the continuity between brake pedal position switch harness connector and ECM harness connector.

Brake pedal position switch		ECM		Continuity
Connector	Terminal	Connector Terminal		Continuity
E109	2	E19	140	Existed

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

Is the inspection result normal?

YES >> GO TO 6.

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

6.CHECK BRAKE PEDAL POSITION SWITCH

Refer to EC-417, "Component Inspection (Brake Pedal Position Switch)".

Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace brake pedal position switch. Refer to <u>BR-20, "Exploded View"</u>.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

Check th Stop Connector E126 the inspec (ES >> (NO >> (.DETECT heck the fo	lamp switch	h rminal 1		onnector. witch harness conn Voltage	ector and ground.					
Stop Connector E126 the inspec (ES >> (NO >> (.DETECT heck the fo	lamp switch Te	h rminal 1	· ·							
Connector E126 the inspec (ES >> (NO >> (.DETECT heck the fo	Te tion resul	rminal	Ground	Voltage						
E126 the inspec (ES >> 0 NO >> 0 .DETECT heck the fo	tion resul	1	Ground	voltage	Stop lamp switch					
the inspec (ES >> (NO >> (.DETECT heck the fo		•								
YES >> (NO >> (DETECT heck the fo		t normal?	Ground	Battery voltage						
NO >> 0 DETECT	GO TO 9.									
.DETECT	GO TO 8.									
heck the fo			PART							
Fuse block		nnector E10	0							
10 A fuse (abort botu	oon oton k	mp owitch and batt	n (
	or open or	Short betw	een stop ia	amp switch and batte	i y					
>>	Repair op	en circuit. s	short to arc	ound or short to pow	er in harness or connectors.					
	• •		•		R OPEN AND SHORT					
	ition swite									
Disconn	ect stop la	amp switch								
Check th	ne continu	uity betweer	n stop lam	o switch harness co	nector and ECM harness conne	ector.				
ECM	Λ	Stop lam	n switch							
Connector	Terminal	Connector	Terminal	Continuity						
E19	139	E126	2	Existed						
Also che	eck harnes	ss for short	to ground	and short to power.						
the inspec	tion resul	t normal?	-							
	GO TO 10									
<u>~</u>	• •		-	fround or short to po	wer in harness or connectors.					
		AMP SWIT								
		-	spection (S	Stop Lamp Switch)".						
the inspec	GO TO 11									
		stop lamp sv	witch.							
1. снеск		IITTENT IN	CIDENT							
		nittent Incid								
>>	INSPECT	ION END								
ompone	nt Inspe	ection (B	rake Peo	dal Position Swi	ch)	INFOID:000000012406577				
.CHECK E	BRAKE PE	EDAL POSI	TION SW	TCH-I						
Turn ign	ition swite	h OFF.								

3. Check the continuity between brake pedal position switch terminals under the following conditions.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

INFOID:000000012406578

Terminals		Condition	Continuity
1 and 2	Brake pedal	Fully released	Existed
	Diake pedal	Slightly depressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2. CHECK BRAKE PEDAL POSITION SWITCH-II

1. Adjust brake pedal position switch installation. Refer to <u>BR-9, "Inspection and Adjustment"</u>.

2. Check the continuity between brake pedal position switch terminals under the following conditions.

Terminals	Condition		Continuity
1 and 2	Brake pedal	Fully released	Existed
T and Z	Brake pedar	Slightly depressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace brake pedal position switch. Refer to <u>BR-20, "Exploded View"</u>.

Component Inspection (Stop Lamp Switch)

1.CHECK STOP LAMP SWITCH-I

- 1. Turn ignition switch OFF.
- 2. Disconnect stop lamp switch harness connector.
- 3. Check harness continuity between stop lamp switch terminals under the following conditions.

Terminals		Condition	Continuity
1 and 2	Brake pedal		Not existed
	Brake peda		Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.CHECK STOP LAMP SWITCH-II

1. Adjust stop lamp switch installation. Refer to <u>BR-9</u>, "Inspection and Adjustment".

2. Check harness continuity between stop lamp switch terminals under the following conditions.

Terminals		Condition	Continuity
1 and 2	Brake pedal	Fully released	Not existed
	Brake peda	Slightly depressed	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace stop lamp switch. Refer to <u>BR-20, "Exploded View"</u>.

P1574 ASCD VEHICLE SPEED SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P1574 ASCD VEHICLE SPEED SENSOR

Description

The ECM receives two vehicle speed 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 <u>EC-46</u>, "<u>AUTOMATIC SPEED CONTROL DEVICE (ASCD)</u>: <u>System Description</u>" for ASCD functions.

DTC Logic

DTC DETECTION LOGIC

NOTE:

- If DTC P1574 is displayed with DTC UXXXX, first perform the trouble diagnosis for DTC UXXXX.
- If DTC P1574 is displayed with DTC P0500, first perform the trouble diagnosis for DTC P0500. Refer to <u>EC-351, "DTC Logic"</u>.
- If DTC P1574 is displayed with DTC P0605, first perform the trouble diagnosis for DTC P0605. Refer to <u>EC-374, "DTC Logic"</u>.
- If DTC P1574 is displayed with DTC P0607, first perform the trouble diagnosis for DTC P0607. Refer F to <u>EC-376, "DTC Logic"</u>.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause	G
P1574	ASCD vehicle speed sensor	The difference the between two vehicle speed signals is out of the specified range.	 Harness or connectors (The CAN communication line is open or shorted.) Combination meter ABS actuator and electric unit (control unit) Wheel sensor TCM ECM 	H

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING	J
If DTC Confirmation Procedure has been previously conducted, always perform the following before conduct- ing the next test. 1. Turn ignition switch OFF and wait at least 10 seconds.	К
 Turn ignition switch ON. Turn ignition switch OFF and wait at least 10 seconds. 	L
>> GO TO 2.	
2.PERFORM DTC CONFIRMATION PROCEDURE	M
 Start engine (VDC switch OFF). Drive the vehicle at more than 40 km/h (25 MPH). CAUTION: 	Ν
Always drive vehicle at a safe speed. NOTE:	
This procedure may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle. 3. Check DTC.	0
Is DTC detected?	
YES >> Proceed to <u>EC-419. "Diagnosis Procedure"</u> . NO >> INSPECTION END	Ρ
Diagnosis Procedure	
1.снеск отс with тсм	
Check DTC with TCM. Refer to TM-42. "CONSULT Function".	

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P1574 ASCD VEHICLE SPEED SENSOR

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 2.

NO >> Perform trouble shooting relevant to DTC indicated.

2. CHECK DTC WITH ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Check DTC with ABS actuator and electric unit (control unit). Refer to <u>BRC-30, "CONSULT Function"</u>. <u>Is the inspection result normal?</u>

YES >> GO TO 3.

NO >> Repair or replace malfunctioning part.

 $\mathbf{3}$. CHECK COMBINATION METER FUNCTION

Check combination meter function. Refer to MWI-36, "CONSULT Function".

>> INSPECTION END

P1650 STARTER MOTOR RELAY 2

< DTC/CIRCUIT DIAGNOSIS >

P1650 STARTER MOTOR RELAY 2

Description

ECM controls ON/OFF state of the starter relay, according to the engine and vehicle condition. Models with no Intelligent Key System transmit a control signal directly to IPDM E/R. On the other hand, models with the Intelligent Key System transmit a control signal to IPDM E/R by way of BCM via CAN communication. Under normal conditions, ECM controls and maintains the starter relay in OFF state during engine running or

"D" position. When detecting a decrease in engine speed due to rapid deceleration or heavy load condition, ECM controls and reactivates the starter relay.

IPDM E/R detects a control state of starter relay and starter control relay and transmits a feedback signal to ECM via CAN communication.

DTC Logic

DTC DETECTION LOGIC

NOTE:

- If DTC P1650 is displayed with DTC U1001, perform the trouble diagnosis for DTC U1001. Refer to <u>EC-180</u>, <u>"DTC Logic"</u>.
- If DTC P1650 is displayed with DTC P0607, perform the trouble diagnosis for DTC P0607. Refer to <u>EC-374</u>, <u>"DTC Logic"</u>.
- If DTC P1650 is displayed with B209F or B20A0 of IPDM E/R, perform the trouble diagnosis for B209F or B20A0. Refer to <u>SEC-109, "DTC Logic"</u> or <u>SEC-111, "DTC Logic"</u>.
- If DTC P1650 is displayed with B26F9 or B26FA of BCM, perform the trouble diagnosis for B209F or B20A0. Refer to <u>SEC-109, "DTC Logic"</u> or <u>SEC-111, "DTC Logic"</u>.

DTC No.	Trouble diagnosis name (Trouble diagnosis content)		DTC detecting condition	Possible cause
		A	Starter relay is stuck ON.	 Harness and connectors (Between IPDM E/R harness connector and ECM harness connector is shorted to ground.) (Between IPDM E/R harness connector and BCM harness connector is shorted to ground.) IPDM E/R
P1650	STR MTR RELAY 2 (Starter relay circuit)	В	Starter relay power supply circuit is excessively high voltage.	 Harness and connectors (Between IPDM E/R harness connector and ECM harness is open or shorted to power.) (Between IPDM E/R harness connector and BCM harness is open or shorted to power.) (Between IPDM E/R harness connector and battery is open.) IPDM E/R
		С	Starter relay circuit is excessively low voltage	 Harness and connectors (Starter relay circuit is open or shorted.) IPDM E/R

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

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

2. Turn ignition switch ON.

3. Turn ignition switch OFF and wait at least 10 seconds.

NOTE:

Before performing the following procedure, confirm that battery voltage is 12 V or more with ignition switch ON.

>> GO TO 2.

INFOID:000000012406583

INFOID:000000012406584

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P1650 STARTER MOTOR RELAY 2

< DTC/CIRCUIT DIAGNOSIS >

$\overline{2}$. PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION A AND C

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.
- 4. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to EC-422, "Diagnosis Procedure".
- NO >> GO TO 3.

$\mathbf{3}$.perform dtc confirmation procedure for malfunction b

With CONSULT

CAUTION:

Always drive at a safe speed.

- 1. Start the engine.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Turn ignition switch ON.
- 4. Start the engine and warm it up to normal operating temperature.
- 5. Turn ignition switch OFF.
- 6. Lift up drive wheels.
- 7. Turn ignition switch ON.
- 8. Select "POWER BALANCE" in "ACTIVE TEST" mode of "ENGINE" using CONSULT.
- 9. Restart the engine and let it idle at least 10 seconds.
- 10. Shift the selector lever to D position while depressing fully the brake pedal.
- 11. Select 1 4 cylinders in "POWER BALANCE" and cut the fuel of all cylinders.
- 12. Check 1st trip DTC.

Without CONSULT

CAUTION:

Always drive at a safe speed.

- 1. Start the engine.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Turn ignition switch ON.
- 4. Start the engine and warm it up to normal operating temperature.
- 5. Turn ignition switch OFF.
- 6. Lift up drive wheels.
- 7. Restart the engine and let it idle at least 10 seconds.
- 8. Shift the selector lever to D position while depressing fully the brake pedal.
- 9. Remove vacuum hoses from intake manifold. Refer to EM-29, "Exploded View".
- 10. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to EC-422, "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000012406585

1. CHECK STARTER RELAY POWER SUPPLY CIRCUIT

Check the starter motor relay power supply circuit. Refer to PCS-33, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK STARTER RELAY CONTROL SIGNAL CIRCUIT

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

^{1.} Turn ignition switch OFF.

P1650 STARTER MOTOR RELAY 2

< DTC/CIRCUIT DIAGNOSIS >

+		-			
IPDM	E/R	BC	M	Continuity	_
Connector	Terminal	Connector	Terminal		
E13	30	M69	64	Existed	
. Also che <u>s the inspec</u>	ck harness	Viring Diagrar for short to g ormal?	<u>n"</u> . round to po	wer.	
NO >> F	Repair or re	place error-de ENT INCIDEN		ts.	
		tent Incident".			
	tion result n				
YES >> F NO >> F	Replace IPL Repair or re	DM E/R. Refe place error-de	r to <u>PCS-34</u> etected part	<u>I, "Removal and Installation"</u> . ts.	
	·				

P1651 STARTER MOTOR RELAY

< DTC/CIRCUIT DIAGNOSIS >

P1651 STARTER MOTOR RELAY

Description

INFOID:000000012406586

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ECM controls ON/OFF state of the starter relay, according to the engine and vehicle condition. Models with no Intelligent Key System transmit a control signal directly to IPDM E/R. On the other hand, models with the Intelligent Key System transmit a control signal to IPDM E/R by way of BCM via CAN communication.

Under normal conditions, ECM controls and maintains the starter relay in OFF state during engine running or "D" position.

When detecting a decrease in engine speed due to rapid deceleration or heavy load condition, ECM controls and reactivates the starter relay.

IPDM E/R detects a control state of starter relay and starter control relay and transmits a feedback signal to ECM via CAN communication.

DTC Logic

INFOID:000000012406587

DTC DETECTION LOGIC

NOTE:

- If DTC P1651 is displayed with DTC U1001, perform the trouble diagnosis for DTC U1001. Refer to <u>EC-180</u>, <u>"DTC Logic"</u>.
- If DTC P1651 is displayed with DTC P0607, perform the trouble diagnosis for DTC P0607. Refer to <u>EC-376</u>, <u>"DTC Logic"</u>.
- If DTC P1651 is displayed with B209F or B20A0 of IPDM E/R, perform the trouble diagnosis for B209F or B20A0. Refer to <u>SEC-109, "DTC Logic"</u> or <u>SEC-111, "DTC Logic"</u>.
- If DTC P1651 is displayed with B26F9 or B26FA of BCM, perform the trouble diagnosis for B209F or B20A0. Refer to <u>SEC-109, "DTC Logic"</u> or <u>SEC-111, "DTC Logic"</u>.

DTC No.	Trouble diagnosis name (Trouble diagnosis content)	DTC	detecting condition
P1651	STR MTR RELAY (Starter control relay circuit)	A correlated error is detected for 2 seconds or more between a control signal transmitted from ECM and a feedback signal transmitted from IPDM E/R via CAN communication line.	 Harness or connectors (Between ECM harness connector and IPDM E/R harness connector is shorted to power.) (Between ECM harness connector and BCM harness connector is shorted to power.) IPDM E/R BCM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

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

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

NOTE:

Before performing the following procedure, confirm that battery voltage is 12 V or more with ignition switch ON.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Start the engine and let it idle at least 30 seconds.
- 3. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to EC-425, "Diagnosis Procedure".
- NO >> INSPECTION END

P1651 STARTER MOTOR RELAY

< DTC/CIRCU			JIJIAN			[VQ35DE]
Diagnosis F	Procedu	re				INFOID:000000012406588
1.INSPECTIO	ON START	-				
Check the star	rter motor	operation.				
Is the starter n		•				E
	O TO 3.					
•	O TO 2.					
2.CHECK DT			DOD 10 10			
Is the inspection			PCS-12, "C	<u>ONSULT FU</u>	nction (IPDM E/R)".	
	0 TO 3.	<u>ormar :</u>				
		uble diagnosis	s for DTC ir	ndicated.		
3. снеск dt	TC WITH E	BCM				
Check DTC w	ith BCM. F	Refer to BCS-	34, "BCM :	CONSULT F	unction (BCM - BCM)".	
Is the inspection		ormal?				
	O TO 4.	uble diagnosis	s for DTC in	ndicated		
4. CHECK CF		-				
	on switch					
2. Disconneo	ct ECM ha	rness conneo				
		R harness co		oonnootor o	d IDDM E/D barnaas connector	
4. Check the	continuity		in namess	connector a	nd IPDM E/R harness connector.	
+		-	-			
ECM	1	IPDN	I E/R	Continuity		
Connector	Terminal	Connector	Terminal			
F15	101	F12	71	Existed		
		for short to g	round to po	wer.		
<u>Is the inspection</u> YES >> G	<u>on result n</u> O TO 5.	<u>ormal?</u>				
		place error-d	etected part	ts.		
5. СНЕСК СБ	RANKING	REQUEST S	IGNAL CIR	CUIT-II		
		rness connec				
2. Check the	e continuity	between EC	M harness	connector a	nd BCM harness connector.	
+						
ECM	1	BC	- M	Continuity		
Connector	Terminal	Connector	Terminal	Continuity		
F15	101	M123	64	Existed		
Refer to S	<u>SEC-39. "</u> V	/iring Diagrar	<u>n"</u> .			
3. Also chec	k harness	for short to g		wer.		
Is the inspection		ormal?				
	O TO 6. enair or re	place error-d	etected nari	ts		
6.CHECK IN	•	-	•			
Perform <u>GI-41</u>						
le the size and set			-			

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to PCS-34, "Removal and Installation".

< DTC/CIRCUIT DIAGNOSIS >

P1652 STARTER MOTOR SYSTEM COMM

< DTC/CIRCUIT DIAGNOSIS >

P1652 STARTER MOTOR SYSTEM COMM

Description

ECM controls ON/OFF state of the starter relay, according to the engine and vehicle condition. Models with no Intelligent Key System transmit a control signal directly to IPDM E/R. On the other hand, models with the Intelligent Key System transmit a control signal to IPDM E/R by way of BCM via CAN communication. Under normal conditions, ECM controls and maintains the starter relay in OFF state during engine running or "D" position.

When detecting a decrease in engine speed due to rapid deceleration or heavy load condition, ECM controls and reactivates the starter relay.

IPDM E/R detects a control state of starter relay and starter control relay and transmits a feedback signal to ECM via CAN communication.

DTC Logic

DTC DETECTION LOGIC

NOTE:

- If DTC P1652 is displayed with DTC U1001, perform the trouble diagnosis for DTC U1001. Refer to <u>EC-180</u>, <u>"DTC Logic"</u>.
- If DTC P1652 is displayed with DTC P0607, perform the trouble diagnosis for DTC P0607. Refer to <u>EC-376</u>, <u>"DTC Logic"</u>.
- If DTC P1652 is displayed with B209F or B20A0 of IPDM E/R, perform the trouble diagnosis for B209F or B20A0. Refer to <u>SEC-109, "DTC Logic"</u> or <u>SEC-111, "DTC Logic"</u>.
- If DTC P1652 is displayed with B26F9 or B26FA of BCM, perform the trouble diagnosis for B209F or B20A0.
 Refer to <u>SEC-109</u>, "DTC Logic" or <u>SEC-111</u>, "DTC Logic".

DTC No.	Trouble diagnosis name (Trouble diagnosis content)	DTC detecting condition		I
P1652	STR MTR SYS COMM (Starter motor communication line)	ECM detects malfunction in starter motor drive circuit of the IPDM E/R.	IPDM E/R	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

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

>> GO TO 2.

2.	PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION	
1.	Turn ignition switch OFF and wait at least 10 seconds.	
2.	Turn ignition switch ON and wait at least 5 minutes.	Ν
3.	Check DTC.	

Is DTC detected?

YES >> Proceed to <u>EC-427</u>, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1.INSPECTION START

- 1. Erase DTC.
- 2. Perform DTC confirmation procedure. Refer to EC-427, "DTC Logic".
- Check DTC.

Is the P1652 displayed again?

YES >> GO TO 2.

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P1652 STARTER MOTOR SYSTEM COMM

< DTC/CIRCUIT DIAGNOSIS >

NO >> INSPECTION END

2. CHECK INTERMITTENT INCIDENT

Perform GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to <u>PCS-34, "Removal and Installation"</u>.

NG >> Repair or replace error-detected parts.

< DTC/CIRCUIT DIAGNOSIS >

P1700 CVT CONTROL SYSTEM

Description

This DTC is displayed with other DTC regarding TCM. Perform the trouble diagnosis for corresponding DTC. Refer to EC-103. "DTC Index". When this DTC is detected, the ASCD control is canceled.

[VQ35DE]

INFOID:000000012406592

P1715 INPUT SPEED SENSOR (PRIMARY SPEED SENSOR)

< DTC/CIRCUIT DIAGNOSIS >

P1715 INPUT SPEED SENSOR (PRIMARY SPEED SENSOR)

Description

ECM receives input speed sensor signal from TCM via the CAN communication line. ECM uses this signal for engine control.

DTC Logic

INFOID:000000012406594

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DTC DETECTION LOGIC

NOTE:

- If DTC P1715 is displayed with DTC UXXXX first perform the trouble diagnosis for DTC UXXXX.
- If DTC P1715 is displayed with DTC P0335, first perform the trouble diagnosis for DTC P0335. Refer to <u>EC-298, "DTC Logic"</u>.
- If DTC P1715 is displayed with DTC P0340, P0345, first perform the trouble diagnosis for DTC P0340, P0345. Refer to <u>EC-301, "DTC Logic"</u>.
- If DTC P1715 is displayed with DTC P0605, first perform the trouble diagnosis for DTC P0605. Refer to <u>EC-374, "DTC Logic"</u>.
- If DTC P1715 is displayed with DTC P0607, first perform the trouble diagnosis for DTC P0607. Refer to <u>EC-376, "DTC Logic"</u>.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1715	Input speed sensor (TCM output)	Input speed sensor signal is different from the theoretical value calculated by ECM from output speed sensor signal and en- gine rpm signal.	 Harness or connectors (The CAN communication line is open or short- ed) Harness or connectors (Input speed sensor circuit is open or shorted) TCM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

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

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine.
- 2. Drive vehicle at a speed of more than 50 km/h (31 MPH) for at least 5 seconds.
- 3. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to EC-430, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1.CHECK DTC WITH TCM

Check DTC with TCM. Refer to TM-59, "DTC Index".

Is the inspection result normal?

YES >> Replace TCM. Refer to <u>TM-192. "Exploded View"</u>.

NO >> Perform trouble shooting relevant to DTC indicated.

INFOID:000000012406595

[VQ35DE]

P1800 VIAS CONTROL SOLENOID VALVE 1

< DTC/CIRCUIT DIAGNOSIS >

DTC DETECTION LOGIC

P1800 VIAS CONTROL SOLENOID VALVE 1

DTC Logic

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INFOID:000000012406596

[VQ35DE]

DTC No.	Trouble diagnosis nan	ne DT	C detecting condition	Possible cause
P1800	VIAS control solenoid valv circuit		ely low or high voltage signal CM through the VIAS control ve 1.	 Harness or connectors (The solenoid valve 1 circuit is open or shorted.) VIAS control solenoid valve 1
	FIRMATION PROCE	EDURE		
1.condi	TIONING			
		as been previou	sly conducted, always p	perform the following before conduct-
ing the nex	xt test. gnition switch OFF and	l wait at least 10	seconds.	
2. Turn ig	gnition switch ON.			
	gnition switch OFF and CONDITION:	i wait at least 10	seconds.	
		g procedure, co	onfirm battery voltage	is more than 11 V at idle.
~	> GO TO 2. DRM DTC CONFIRMAT		IRE	
	engine and let it idle for			
	s 1st trip DTC.	at 16031 0 36001	iu3.	
•	DTC detected?			
	> Proceed to <u>EC-431,</u> > INSPECTION END	"Diagnosis Proce	<u>edure"</u> .	
-	is Procedure			INFOID:000000012406597
				INF-01D.000000012408397
	VIAS CONTROL SOL	_ENOID VALVE	1 POWER SUPPLY	
	gnition switch OFF. nnect VIAS control sole	enoid valve 1 hai	mess connector	
3. Turn iç	gnition switch ON.			
4. Check	the voltage between V	VIAS control sole	enoid valve 1 harness co	onnector and ground.
VIAS c	control solenoid valve 1			
Connec	tor Terminal	Ground	Voltage	
F74	1	Ground	Battery voltage	
	ection result normal?			
YES >	> GO TO 2. > Repair open circuit is	short to around c	or short to power in harn	ess or connectors
NO >	. topan open oneut, c	-	-	
-	VIAS CONTROL SOL			
2. CHECK	VIAS CONTROL SOL			
2.CHECK 1. Turn iq 2. Discor	gnition switch OFF. nnect ECM harness co	nnector.		s connector and ECM harness con-

VIAS control solenoid valve 1		ECM		Continuity
Connector	Terminal	Connector	Terminal	Continuity
F74	2	F15	108	Existed

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P1800 VIAS CONTROL SOLENOID VALVE 1

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

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

Is the inspection result normal?

YES >> GO TO 3.

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

3.CHECK VIAS CONTROL SOLENOID VALVE 1

Check VIAS control solenoid valve 1. Refer to EC-432, "Component Inspection".

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u>.
- NO >> Replace VIAS control solenoid valve 1. Refer to EM-29, "Exploded View".

Component Inspection

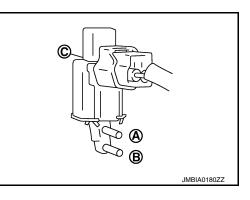
INFOID:000000012406598

1.CHECK VIAS CONTROL SOLENOID VALVE 1

With CONSULT

- 1. Turn ignition switch OFF.
- 2. Reconnect all harness connectors disconnected.
- 3. Disconnect vacuum hoses connected to VIAS control solenoid valve 1.
- 4. Turn ignition switch ON.
- 5. Select "VIAS S/V-1" in "ACTIVE TEST" mode with CONSULT.
- 6. Check air passage continuity and operation delay time under the following conditions.

Condition (VIAS S/V-1)	Air passage continuity between (A) and (B)	Air passage continuity between (A) and (C)
ON	Existed	Not existed
OFF	Not existed	Existed



Without CONSULT

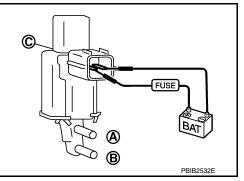
- 1. Turn ignition switch OFF.
- 2. Disconnect VIAS control solenoid valve 1 harness connector.
- 3. Disconnect vacuum hoses connected to VIAS volume control solenoid valve 1.
- 4. Check air passage continuity and operation delay time under the following conditions.

Condition	Air passage continuity between (A) and (B)	Air passage continuity between (A) and (C)	
12 V direct current supply be- tween terminals 1 and 2	Existed Not existe		
No supply	Not existed	Existed	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace VIAS control solenoid valve 1. Refer to <u>EM-29</u>, <u>"Exploded View"</u>.



P1801 VIAS CONTROL SOLENOID VALVE 2

< DTC/CIRCUIT DIAGNOSIS >

P1801 VIAS CONTROL SOLENOID VALVE 2

DTC Logic

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INFOID:000000012406599

[VQ35DE]

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis nar	me DT	C detecting condition	Possible cause
P1801	VIAS control solenoid val- circuit		ely low or high voltage signa CM through the VIAS contro ve 2.	
OTC CON	IFIRMATION PROC	EDURE		
1.condi	TIONING			
If DTC Co	nfirmation Procedure h	nas been previou	sly conducted, always	perform the following before conduct-
ing the nex	tt test. gnition switch OFF and	l wait at least 10	seconds	
2. Turn ig	nition switch ON.			
	nition switch OFF and CONDITION:	d wait at least 10	seconds.	
		ng procedure, co	onfirm battery voltage	e is more than 11 V at idle.
•	> GO TO 2.			
2. PERFO	RM DTC CONFIRMA	TION PROCEDU	RE	
	ngine and let it idle for	r at least 5 secon	ds.	
	1st trip DTC. <u>DTC detected?</u>			
	Proceed to <u>EC-433</u> ,	"Diagnosis Proce	edure".	
	> INSPECTION END			
Diagnos	is Procedure			INFOID:000000012406600
1 .CHECK	VIAS CONTROL SO		2 POWER SUPPLY	
	nition switch OFF.			
2. Discor	nect VIAS control sol	enoid valve 2 har	ness connector.	
	nition switch ON.	VIAS control sole	noid valve 2 harness o	connector and ground.
	the relage settieen			
VIAS c	ontrol solenoid valve 2	Ground	Voltago	
Connec	tor Terminal	Ground	Voltage	
F75	1	Ground	Battery voltage	
	ection result normal?			
	> GO TO 2.	short to around a	r short to power in har	ness or connectors
-		-	•	IRCUIT FOR OPEN AND SHORT
	nition switch OFF.			
	nect ECM harness co	nnector.		

3. Check the continuity between VIAS control solenoid valve 2 harness connector and ECM harness connector.

VIAS control s	olenoid valve 2	E	Continuity	
Connector	Terminal	Connector	Terminal	Continuity
F75	2	F15	102	Existed

Revision: October 2015

P1801 VIAS CONTROL SOLENOID VALVE 2

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

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

Is the inspection result normal?

YES >> GO TO 3.

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

3.CHECK VIAS CONTROL SOLENOID VALVE 2

Check VIAS control solenoid valve 2. Refer to EC-434, "Component Inspection".

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u>.
- NO >> Replace VIAS control solenoid valve 2. Refer to EM-29, "Exploded View".

Component Inspection

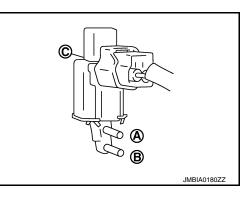
INFOID:000000012406601

1.CHECK VIAS CONTROL SOLENOID VALVE 2

With CONSULT

- 1. Turn ignition switch OFF.
- 2. Reconnect all harness connectors disconnected.
- 3. Disconnect vacuum hoses connected to VIAS control solenoid valve 2.
- 4. Turn ignition switch ON.
- 5. Select "VIAS S/V-2" in "ACTIVE TEST" mode with CONSULT.
- 6. Check air passage continuity and operation delay time under the following conditions.

Condition (VIAS S/V-2)	Air passage continuity between (A) and (B)	Air passage continuity between (A) and (C)
ON	Existed	Not existed
OFF	Not existed	Existed



Without CONSULT

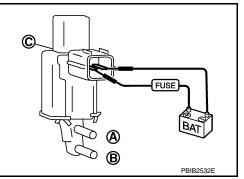
- 1. Turn ignition switch OFF.
- 2. Disconnect VIAS control solenoid valve 2 harness connector.
- 3. Disconnect vacuum hoses connected to VIAS volume control solenoid valve 2.
- 4. Check air passage continuity and operation delay time under the following conditions.

Condition	Air passage continuity between (A) and (B)	Air passage continuity between (A) and (C)	
12 V direct current supply be- tween terminals 1 and 2	Existed	Not existed	
No supply	Not existed	Existed	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace VIAS control solenoid valve 2. Refer to <u>EM-29</u>, <u>"Exploded View"</u>.



P1805 BRAKE SWITCH

Description

Brake switch signal is applied to the ECM via the stop lamp switch when the brake pedal is depressed. This signal is used mainly to decrease the engine speed when the vehicle is driven.

DTC Logic

INFOID:000000012406603

INFOID:000000012406602

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DT	C detecting condition	Possible cause		
P1805			signal is not sent to ECM for ex me while the vehicle is driving.	 Harness or connectors (Stop lamp switch circuit is open or short- ed.) Stop lamp switch 		
DTC CON	FIRMATION PROC	EDURE				
1.PERFO	RM DTC CONFIRMA	TION PROCE	DURE		ŀ	
 Fully de Erase t Check Is 1st trip D YES >> 	nition switch ON. epress the brake ped he DTC with CONSL 1st trip DTC. <u>TC detected?</u> • Go to <u>EC-435, "Diac</u> • INSPECTION END	ILT.			(
Diagnosi	s Procedure			INFOID:000000012406604		
1.снеск	STOP LAMP SWITC	H CIRCUIT				
	nition switch OFF.				,	
2. Check	the stop lamp when o	lepressing an	d releasing the brake ped	al.		
Brake	e pedal St	op lamp			I	
	-	lluminated				
Slightly o	lepressed Illu	iminated				
	ction result normal?					
	• GO TO 6. • GO TO 2.					
-	STOP LAMP SWITC					
	nect stop lamp switch					
			tch harness connector an	d ground.		
01	a la su a l'Isla					
Connecto	op lamp switch	Ground	Voltage		(
E126	1	Ground	Battery voltage			
	ction result normal?					
	GO TO 4.					
•	GO TO 3.					
		PARI				
Check the f • Fuse bloc	ollowing. k (J/B) connector E1	00				
• 10 A fuse						

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EC

С

P1805 BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

· Harness for open or short between battery and stop lamp switch

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

4.CHECK STOP LAMP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.

2. Disconnect stop lamp switch harness connector.

3. Check the continuity between stop lamp switch harness connector and ECM harness connector.

EC	М	Stop lam	Continuity	
Connector	Terminal	Connector	Terminal	Continuity
E19	139	E126	2	Existed

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

Is the inspection result normal?

YES >> GO TO 5.

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

5.CHECK STOP LAMP SWITCH

Refer to EC-436, "Component Inspection (Stop Lamp Switch)".

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace stop lamp switch.

6.CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

>> INSPECTION END

Component Inspection (Stop Lamp Switch)

INFOID:000000012406605

1.CHECK STOP LAMP SWITCH-I

- 1. Turn ignition switch OFF.
- 2. Disconnect stop lamp switch harness connector.
- 3. Check harness continuity between stop lamp switch terminals under the following conditions.

Terminals		Continuity	
1 and 2	Brake pedal	Fully released	Not existed
T and 2	Brake pedal	Slightly depressed	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.CHECK STOP LAMP SWITCH-II

1. Adjust stop lamp switch installation. Refer to <u>BR-9, "Inspection and Adjustment"</u>.

2. Check harness continuity between stop lamp switch terminals under the following conditions.

Terminals	(Continuity	
1 and 2	Brake pedal	Fully released	Not existed
i anu z	Brake pedar	Slightly depressed	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace stop lamp switch. Refer to <u>BR-20, "Exploded View"</u>.

< DTC/CIRCUIT DIAGNOSIS >

P2096, P2097, P2098, P2099 A/F SENSOR 1

DTC Logic

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INFOID:000000012406607

[VQ35DE]

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name (Trouble diagnosis content)	DTC detecting condition	Possible Cause		
P2096	POST CAT FUEL TRIM SYS B1 (Post catalyst fuel trim system too lean bank 1)	The output voltage computed by ECM from the A/ F sensor 1 signal is shifts to the lean side for a specified period.	 A/F sensor 1 (bank 1) A/F sensor 1 heater Heated oxygen sensor 2 (bank 1) Fuel pressure 		
P2097	POST CAT FUEL TRIM SYS B1 (Post catalyst fuel trim system too rich bank 1)	The A/F signal computed by ECM from the A/F sensor 1 signal is shifts to the rich side for a spec- ified period.	 Fuel pressure Fuel injector Intake air leaks Exhaust gas leaks 		
P2098	POST CAT FUEL TRIM SYS B2 (Post catalyst fuel trim system too lean bank 2)	The output voltage computed by ECM from the A/ F sensor 1 signal is shifts to the lean side for a specified period.	 A/F sensor 1 (bank 2) A/F sensor 1 heater Heated oxygen sensor 2 (bank 2) 		
P2099	POST CAT FUEL TRIM SYS B2 (Post catalyst fuel trim system too rich bank 2)	The A/F signal computed by ECM from the A/F sensor 1 signal is shifts to the rich side for a spec- ified period.	 Fuel pressure Fuel injector Intake air leaks Exhaust gas leaks 		

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

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

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 11 V at idle.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- 1. Clear the mixture ratio self-learning value. Refer to EC-151, "Description".
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Turn ignition switch ON.
- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Start engine and keep the engine speed between 3,500 and 4,000 rpm for 1 minute under no load.
- 6. Let engine idle for 1 minute.
- 7. Keep engine speed between 2,500 and 3,000 rpm for 20 minutes.
- 8. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to EC-437, "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

1.RETIGHTEN A/F SENSOR 1 AND HEATED OXYGEN SENSOR 2

Loosen and retighten the A/F sensor 1 and heated oxygen senosr 2. Refer to EM-34. "Exploded View".

>> GO TO 2.

2.CHECK FOR EXHAUST GAS LEAK

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INFOID:000000012406608

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P2096, P2097, P2098, P2099 A/F SENSOR 1

< DTC/CIRCUIT DIAGNOSIS >

- 1. Start engine and run it at idle.
- 2. Listen for an exhaust gas leak before the three way catalyst 2.

Is exhaust gas leak detected?

YES >> Repair or replace.

NO >> GO TO 3.

3.CHECK FOR INTAKE AIR LEAKAGE

- 1. Start engine and run it at idle.
- 2. Listen for an intake air leakage after the mass air flow sensor.

Is intake air leakage detected?

YES >> GO TO 4.

NO >> Repair or replace malfunctioning part.

 ${f 4}.$ CLEAR THE MIXTURE RATIO SELF-LEARNING VALUE

1. Clear the mixture ratio self-learning value. Refer to EC-151, "Description".

2. Run engine for at least 10 minutes at idle speed.

Is the 1st trip DTC P0171, P0172, P0174 or P0175 detected? Is it difficult to start engine?

YES >> Perform trouble diagnosis for DTC P0171, P0174 or P0172, P0175. Refer to <u>EC-267, "DTC Logic"</u> or <u>EC-271, "DTC Logic"</u>.

NO >> GO TO 5.

5.CHECK HARNESS CONNECTOR

1. Turn ignition switch OFF.

- 2. Disconnect A/F sensor 1 harness connector.
- 3. Check harness connector for water.

Water should not exit.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace harness connector.

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

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

DTC		A/F sensor	Ground	Voltage (V)		
DIC	Bank	Connector	Terminal	Ground	voltage (v)	
P2096 P2097	1	F28	1	Ground	Battery voltage	
P2098 P2099	2	F65	1	Ground	Dattery voltage	

Is the inspection result normal?

YES >> GO TO 8.

NO >> GO TO 7.

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

1. Turn ignition switch OFF.

2. Disconnect IPDM E/R harness connector.

3. Check the continuity between A/F sensor 1 harness connector and IPDM E/R harness connector.

P2096, P2097, P2098, P2099 A/F SENSOR 1

< DTC/CIRCUIT DIAGNOSIS >

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DT		A/I	⁼ sensor 1			IPD	M E/R		Continuity			A
DI		Bank C	onnector	Terminal	Co	nnector	Term	inal	Continuity			
P20 P20		1	F28	1		F12	57	7	Existed			EC
P20 P20		2	F65	1		1 12	57		LAISteu			C
Is the in	spection	result norma	al?									С
	>> Repa CK A/F S	orm the troul air or replace ENSOR 1 II	e error-de	tected part	ts.			AND S	SHORT			D
2. Dis	connect E	switch OFF. ECM harnes: ontinuity bet	s connect		narne	ess con	nector	and E	ECM harness	connector		E
DTC		A/F sensor	1		E	СМ		Conti	ouity			F
DIC	Bank	Connecto	Termin	al Conne	ector	Term	inal	Conu	nuity			
P2096	4	F00	3			66	6					
P2097	1	F28	4		-	67	7	Exis	ted			G
P2098			3	F1	5	76	6					
P2099	2	F65	4			77	7					Н
	eck the co d ground.	ontinuity bet	ween A/F	sensor 1	harr	ness co	nnecto	r and	I ground, or E	CM harne	ess connecto	or
		A/F sensor 1										
DTC	Bank	Connector	Terminal	Ground		Continu	uity					
P2096 P2097	1	F28 -	3 4	-								J
			3	Ground		Not exis	sted					
P2098 P2099	2	F65	4	-								K
		ECM										L
DTC			- Grour	id Cor	ntinuity	y						
	Connecto											
P2096 P2097		66	_									Μ
	F15	67	Grour	nd Not	existe	d						
P2098 P2099		76	_									Ν
		77										11
		arness for s	-	wer.								
		result norma	<u>al?</u>									0
YES NO	>> GO ⁻ >> Rena		uit short t	to around a	or sh	ort to p	ower in	harr	ess or conne	tors		
-		ENSOR 1 F		.e g. cana c		5 to p	5 0 / III					_
				0.404 110								P
		or 1 heater. F		<u>C-191, "Co</u>	ompc	onent in	ISPECTIC	<u>on"</u> .				
<u>Is the in</u> YES	ispection >> GO ⁻	result norma	<u>ai :</u>									
NO	>> GO >> GO ⁻											
10.cr	HECK HE	ATED OXYO										
Check h	neated ox	ygen sensoi	2. Refer	to <u>EC-194</u>	. "Co	ompone	ent Insp	ectio	<u>n"</u> .			
Revisio	on: Octob	er 2015			EC	-439					2016 Ques	t

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 11.

NO >> Replace malfunctioning heated oxygen sensor 2.

11. CHECK INTERMITTENT INCIDENT

Perform GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> GO TO 12.

NO >> Repair or replace malfunctioning part.

12.REPLACE AIR FUEL RATIO (A/F) SENSOR 1

Replace malfunctioning air fuel ratio (A/F) sensor 1. Refer to EM-34, "Exploded View".

CAUTION:

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

Do you have CONSULT?

YES >> GO TO 13.

NO >> GO TO 14.

13.CONFIRM A/F ADJUSTMENT DATA

With CONSULT

- 1. Turn ignition switch ON.
- 2. Select "A/F ADJ-B1" and "A/F ADJ-B2" in "DATA MONITOR" mode with CONSULT.
- 3. Make sure that "0.000" is displayed on CONSULT screen.

Is "0.000" displayed?

YES >> INSPECTION END

NO >> GO TO 14.

14. CLEAR THE MIXTURE RATIO SELF-LEARNING VALUE

Clear the mixture ratio self-learning value. Refer to EC-151, "Description".

Do you have CONSULT?

YES >> GO TO 15.

NO >> INSPECTION END

15. CONFIRM A/F ADJUSTMENT DATA

With CONSULT

- Turn ignition switch ON.
- 2. Select "A/F ADJ-B1" and "A/F ADJ-B2" in "DATA MONITOR" mode with CONSULT.
- 3. Make sure that "0.000" is displayed on CONSULT screen.

>> INSPECTION END

P2100, P2103 THROTTLE CONTROL MOTOR RELAY

< DTC/CIRCUIT DIAGNOSIS >

P2100, P2103 THROTTLE CONTROL MOTOR RELAY

DTC Logic

INFOID:000000012406609

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DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P2100	Throttle control motor relay circuit open	ECM detects that the 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
P2103	Throttle control motor relay circuit short	ECM detects that the throttle control motor relay is stuck ON.	 Harness or connectors (Throttle control motor relay circuit is shorted) Throttle control motor relay
	IFIRMATION PROC	EDURE	
If DTC Cor	nfirmation Procedure h	as been previously conducted, always	perform the following before conduct-
ing the nex 1. Turn ig		l wait at least 10 seconds.	
2. Turn ig	nition switch ON.	l wait at least 10 seconds.	
	CONDITION:		
-	is detected?	g procedure, confirm that battery vol	tage is more than 8 V.
P2100 >>	> GO TO 2.		
^	> GO TO 3.		
		TION PROCEDURE FOR DTC P2100	
	ngine and let it idle for	wait at least 2 seconds. 5 seconds.	
<u>Is DTC det</u>	ected?		
	Proceed to <u>EC-441.</u> INSPECTION END	"Diagnosis Procedure".	
-		TION PROCEDURE FOR DTC P2103	
1. Turn ig	nition switch ON and	wait at least 1 second.	
2. Check Is DTC det			
		"Diagnosis Procedure".	
	> INSPECTION END		
Diagnosi	is Procedure		INFOID:000000012406610
1.снеск	THROTTLE CONTRO	OL MOTOR RELAY POWER SUPPLY C	CIRCUIT
	nition switch OFF.		
	nect ECM harness co nect IPDM E/R harne		
		n IPDM E/R harness connector and ECI	M harness connector

4. Check the continuity between IPDM E/R harness connector and ECM harness connector.

IPDN	/I E/R	E	CM	Continuity
Connector	Terminal	Connector	Terminal	Continuity
F12	70	F14	8	Existed

P2100, P2103 THROTTLE CONTROL MOTOR RELAY

< DTC/CIRCUIT DIAGNOSIS >

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

Is the inspection result normal?

YES >> GO TO 2.

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

2. CHECK THROTTLE CONTROL MOTOR RELAY INPUT SIGNAL CIRCUIT

1. Check the continuity between IPDM E/R harness connector and ECM harness connector.

IPDN	II E/R	E	CM	Continuity
Connector	Terminal	Connector	Terminal	Continuity
F12	54	F14	2	Existed

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

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit.

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

P2101 ELECTRIC THROTTLE CONTROL FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

P2101 ELECTRIC THROTTLE CONTROL FUNCTION

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P2101 is displayed with DTC P2100, first perform the trouble diagnosis for DTC P2100. Refer to <u>EC-441, "DTC Logic"</u>.

If DTC P2101 is displayed with DTC 2119, first perform the trouble diagnosis for DTC P2119. Refer to <u>EC-448, "DTC Logic"</u>.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P2101	Electric throttle control performance	Electric throttle control function does not oper- ate properly.	 Harness or connectors (Throttle control motor circuit is open or shorted) Electric throttle control actuator

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

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

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 11 V when engine is running.

2	>>	GO	ТО	2.

2. PERFORM DTC CONFIRMATION PROCEDURE

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

- 2. Start engine and let it idle for 5 seconds.
- Check DTC.

Is DTC detected?

YES >> Proceed to <u>EC-443</u>, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1. CHECK THROTTLE CONTROL MOTOR RELAY INPUT SIGNAL

1. Check the voltage between ECM harness connector terminals.

	EC	M			
	F	-	-	Condition	Voltage
Connector	Terminal	Condition	Terminal		
F14	2	E19	152	Ignition switch OFF	Approx. 0 V
1 14	2	L19	152	Ignition switch ON	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 2.

2.CHECK THROTTLE CONTROL MOTOR RELAY POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.

2. Disconnect ECM harness connector.

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P2101 ELECTRIC THROTTLE CONTROL FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

3. Disconnect IPDM E/R harness connector.

4. Check the continuity between IPDM E/R harness connector and ECM harness connector.

IPDN	II E/R	E	CM	Continuity
Connector	Terminal	Connector	Terminal	Continuity
F12	70	F14	8	Existed

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

Is the inspection result normal?

YES >> GO TO 3.

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

3.CHECK THROTTLE CONTROL MOTOR RELAY INPUT SIGNAL CIRCUIT

1. Check the continuity between IPDM E/R harness connector and ECM harness connector.

IPDN	II E/R	E	CM	Continuity
Connector	Terminal	Connector	Terminal	Continuity
F12	54	F14	2	Existed

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

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit.

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

4.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 the continuity between electric throttle control actuator harness connector and ECM harness connector.

Electric throttle	control actuator	ECI	N	Continuity
Connector	Terminal	Connector	Terminal	Continuity
	2		1	Existed
F50	2	F14	3	Not existed
F30	1	F14	1	Not existed
	I		3	Existed

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

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace malfunctioning part.

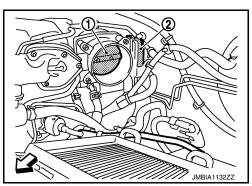
5. CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

1. Remove the intake air duct. Refer to EM-27, "Exploded View".

- 2. Check if foreign matter is caught between the throttle valve (1) and the housing.
- Electric throttle control actuator (2)
- <>: Vehicle front

Is the inspection result normal?

- YES >> GO TO 6.
- NO >> Remove the foreign matter and clean the electric throttle control actuator inside, refer to <u>EM-29</u>, <u>"Exploded View"</u>, and then perform throttle valve closed position learning. Refer to <u>EC-148</u>, <u>"Description"</u>.



[VQ35DE]

P2101 ELECTRIC THROTTLE CONTROL FUNCTION

P2 < DTC/CIRCUIT DIAG	101 ELECTRIC THROTTLE CONTROL FUNCTION GNOSIS >	[VQ35DE]
6.CHECK THROTTLE	E CONTROL MOTOR	
Check throttle control n	notor. Refer to EC-445, "Component Inspection".	
Is the inspection result	normal?	
YES >> GO TO 7. NO >> Replace el	ectric throttle control actuator. Refer to EM-29, "Exploded View".	E
7. CHECK INTERMIT		
	dent. Refer to <u>GI-41, "Intermittent Incident"</u> .	
Is the inspection result		
	ectric throttle control actuator. Refer to <u>EM-29, "Exploded View"</u> . eplace error-detected parts.	l
Component Inspe	ction	INFOID:000000012406613
1.CHECK THROTTLE	E CONTROL MOTOR	
	n OFF. c throttle control actuator harness connector. petween electric throttle control actuator terminals as per the following.	
Terminals	Resistance	(
1 and 2	Approx. 1 - 15 Ω [at 25°C (77°F)]	
Is the inspection result YES >> INSPECTION NO >> Replace el		l
		(

P2118 THROTTLE CONTROL MOTOR

< DTC/CIRCUIT DIAGNOSIS >

P2118 THROTTLE CONTROL MOTOR

DTC Logic

INFOID:000000012406614

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DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P2118	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)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

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

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Turn ignition switch ON and wait at least 2 seconds.
- 2. Start engine and let it idle for 5 seconds.
- 3. Check DTC.

Is DTC detected?

YES >> Proceed to EC-446, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000012406615

1. CHECK THROTTLE CONTROL MOTOR OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Disconnect electric throttle control actuator harness connector.
- 2. Disconnect ECM harness connector.
- Check the continuity between electric throttle control actuator harness connector and ECM harness connector.

Electric throttle	control actuator	ECI	N	Continuity
Connector	Terminal	Connector	Terminal	Continuity
	2		1	Existed
F50	2	F14	3	Not existed
1 50	1	1 14	1	Not existed
	Ι		3	Existed

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

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace malfunctioning part.

2. CHECK THROTTLE CONTROL MOTOR

Check throttle control motor. Refer to EC-447, "Component Inspection".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u>.

NO >> Replace electric throttle control actuator. Refer to <u>EM-29, "Exploded View"</u>.

EC-446

P2118 THROTTLE CONTROL MOTOR

< DTC/CIRCUIT DIAGNOSIS >

Component Inspection

[VQ35DE] INFOID:000000012406616

1. CHECK THROTTLE CONTROL MOTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect electric throttle control actuator harness connector.
- 3. Check resistance between electric throttle control actuator terminals as per the following.

Terminals	Resistance
1 and 2	Approx. 1 - 15 Ω [at 25°C (77°F)]
Is the inspection result	normal?

	in op o odion i o o die nonnan.	
YES	>> INSPECTION END	

NO >> Replace electric throttle control actuator. Refer to EM-29, "Exploded View".

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P2119 ELECTRIC THROTTLE CONTROL ACTUATOR

< DTC/CIRCUIT DIAGNOSIS >

P2119 ELECTRIC THROTTLE CONTROL ACTUATOR

DTC Logic

INFOID:000000012406617

IVQ35DE1

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition		Possible cause
		A)	Electric throttle control actuator does not func- tion properly due to the return spring malfunc- tion.	
P2119	Electric throttle control actuator	B)	Throttle valve opening angle in fail-safe mode is not in specified range.	Electric throttle control actuator
		C)	ECM detects that the throttle valve is stuck open.	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

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

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION A AND B

- 1. Turn ignition switch ON and wait at least 1 second.
- 2. Shift selector lever to the D position and wait at least 3 seconds.
- 3. Shift selector lever to the P position.
- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Turn ignition switch ON and wait at least 1 second.
- 6. Shift selector lever to the D position and wait at least 3 seconds.
- 7. Shift selector lever to the P position.
- 8. Turn ignition switch OFF, wait at least 10 seconds, and then turn ON.
- 9. Check DTC.

Is DTC detected?

- YES >> Proceed to EC-448, "Diagnosis Procedure".
- NO >> GO TO 3.

3. PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION C

- 1. Turn ignition switch ON and wait at least 1 second.
- 2. Shift selector lever to the D position and wait at least 3 seconds.
- 3. Shift selector lever to the N or P position.
- 4. Start engine and let it idle for 3 seconds.
- 5. Check DTC.

Is DTC detected?

- YES >> Proceed to EC-448, "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

1. CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

- 1. Turn ignition switch OFF.
- 2. Remove the intake air duct. Refer to EM-27, "Exploded View".

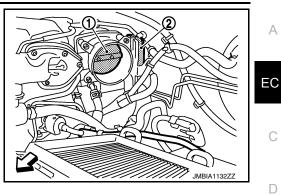
P2119 ELECTRIC THROTTLE CONTROL ACTUATOR

< DTC/CIRCUIT DIAGNOSIS >

- 3. Check if foreign matter is caught between the throttle valve (1) and the housing.
- Electric throttle control actuator (2)
- <>: Vehicle front

Is the inspection result normal?

- YES >> GO TO 2.
- NO >> Remove the foreign matter and clean the electric throttle control actuator inside, and then perform throttle valve closed position learning. Refer to <u>EC-148</u>, "<u>Description</u>".



[VQ35DE]

2.REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

- 1. Replace electric throttle control actuator. Refer to EM-29, "Exploded View".
- 2. Go to EC-149, "Description".

>> INSPECTION END

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P2122, P2123 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P2122, P2123 APP SENSOR

DTC Logic

NOTE:

If DTC P2122 or P2123 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. Refer to <u>EC-379, "DTC Logic"</u>.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P2122	Accelerator pedal posi- tion sensor 1 circuit low input	An excessively low voltage from the APP sensor 1 is sent to ECM.	 Harness or connectors (APP sensor 1 circuit is open or shorted.)
P2123	Accelerator pedal posi- tion sensor 1 circuit high input	An excessively high voltage from the APP sensor 1 is sent to ECM.	 Accelerator pedal position sensor (APP sensor 1)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

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

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10 V at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine and let it idle for 1 second.
- 2. Check DTC.

Is DTC detected?

YES >> Proceed to EC-450, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1. CHECK APP SENSOR 1 POWER SUPPLY

1. Disconnect accelerator pedal position (APP) sensor harness connector.

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

APP	sensor	Ground	Voltage (V)
Connector	Connector Terminal		voltage (v)
E110	4	Ground	Approx. 5

Is the inspection result normal?

YES >> GO TO 2.

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

2.CHECK APP SENSOR 1 GROUND CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.

3. Check the continuity between APP sensor harness connector and ECM harness connector.

EC-450

INFOID:000000012406620

INFOID:000000012406619

P2122, P2123 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

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INFOID:000000012406621

APP sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E110	2	E19	151	Existed

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

Is the inspection result normal?

YES >> GO TO 3.

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

 ${f 3}.$ CHECK APP SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between APP sensor harness connector and ECM harness connector.

-	APP :	sensor	E	ECM		
-	Connector	Terminal	Connector	Terminal	Continuity	
-	E110	3	E19	150	Existed	

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

Is the inspection result normal?

YES >> GO TO 4.

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

4.CHECK APP SENSOR

Check APP sensor. Refer to EC-451, "Component Inspection".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u>.

NO >> Replace accelerator pedal assembly. Refer to <u>ACC-4</u>, "Exploded View".

Component Inspection

1. CHECK ACCELERATOR PEDAL POSITION SENSOR

1. Reconnect all harness connectors disconnected.

2. Turn ignition switch ON.

3. Check the voltage between ECM harness connector terminals under the following conditions.

ECM									
+			– Condition		dition Voltage (V)		Condition Voltage (V)		
Connector	Terminal	Connector	Terminal						
	150		151		Fully released	0.5 - 1.0			
E19	(APP sensor 1 sig- nal)	E19	(Sensor ground)	Accelerator pedal	Fully depressed	4.2 - 4.8			
E19	143	E19	144		Fully released	0.25 - 0.50			
	(APP sensor 2 sig- nal)		(Sensor ground)		Fully depressed	2.0 - 2.5			

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace accelerator pedal assembly. Refer to <u>ACC-4. "Exploded View"</u>.

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< DTC/CIRCUIT DIAGNOSIS >

P2127, P2128 APP SENSOR

DTC Logic

INFOID:000000012406622

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P2127	Accelerator pedal posi- tion sensor 2 circuit low input	An excessively low voltage from the APP sen- sor 2 is sent to ECM.	Harness or connectors (APP sensor 2 circuit is open or shorted.) [CMP sensor (PHASE) circuit is shorted.]
P2128	Accelerator pedal posi- tion sensor 2 circuit high input	An excessively high voltage from the APP sensor 2 is sent to ECM.	 (Refrigerant pressure sensor circuit is shorted.) (Battery current sensor circuit is shorted.) (EOP sensor circuit is shorted.) Accelerator pedal position sensor (APP sensor 2) Camshaft position (CMP) sensor (PHASE) Battery current sensor Engine oil pressure (EOP) sensor Refrigerant pressure sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

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

3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 8 V at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine and let it idle for 1 second.
- 2. Check DTC.

Is DTC detected?

YES >> Proceed to <u>EC-452</u>, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000012406623

1.CHECK APP SENSOR 2 POWER SUPPLY

1. Disconnect accelerator pedal position (APP) sensor harness connector.

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

APP	sensor	Ground	Voltage (V)
Connector Terminal		Ground	voltage (v)
E110	5	Ground	Approx. 5

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 2.

2.CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.

Revision: October 2015

P2127, P2128 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

2. Disconnect ECM harness connector.

3. Check the continuity between APP sensor harness connector and ECM harness connector.

APP	APP sensor ECM			Continuity
Connector	Terminal	Connector	Terminal	Continuity
E110	5	E19	142	Existed

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit.

3.CHECK SENSOR POWER SUPPLY CIRCUIT

Check harness for short to power and short to ground, between the following terminals.

ECMSensorConnectorTerminalNameConnectorTerminalE19142APP sensor 2E1105F1418Refrigerant pressure sensorE3001EOP sensorF673F1592CMP sensor (PHASE) (bank 1)F451St the inspection result normal?YES> GO TO 4.NO>> Repair short to ground or short to power in harness or connectors.4.CHECK COMPONENTSCheck the following.• Battery current sensor (PHASE) (bank 1) (Refer to EC-303, "Component Inspection".)• Camshaft position sensor (PHASE) (bank 1) (Refer to EC-303, "Component Inspection".)
E19142APP sensor 2E1105F1418Refrigerant pressure sensorE3001F1418EOP sensorF673F1587Battery current sensorF76192CMP sensor (PHASE) (bank 1)F451CMP sensor (PHASE) (bank 2)F461Is the inspection result normal?YES>> GO TO 4.NO>> Repair short to ground or short to power in harness or connectors.4.CHECK COMPONENTSCheck the following.• Battery current sensor (Refer to EC-333, "Component Inspection".)• Camshaft position sensor (PHASE) (bank 1) (Refer to EC-303, "Component Inspection".)
F1418Refrigerant pressure sensorE3001F1418 EOP sensor $F67$ 3F1587Battery current sensor $F76$ 192 CMP sensor (PHASE) (bank 1) $F45$ 1 $P15$ 92 CMP sensor (PHASE) (bank 2) $F46$ 1Is the inspection result normal?YES>> GO TO 4.NO>> Repair short to ground or short to power in harness or connectors.4.CHECK COMPONENTSCheck the following.• Battery current sensor (Refer to EC-333, "Component Inspection".)• Camshaft position sensor (PHASE) (bank 1) (Refer to EC-303, "Component Inspection".)
F1418EOP sensorF673EOP sensorF673F1587Battery current sensorF76192CMP sensor (PHASE) (bank 1)F451CMP sensor (PHASE) (bank 2)Is the inspection result normal?YES>> GO TO 4.NO>> Repair short to ground or short to power in harness or connectors.4.CHECK COMPONENTSCheck the following.• Battery current sensor (Refer to EC-333, "Component Inspection".)• Camshaft position sensor (PHASE) (bank 1) (Refer to EC-303, "Component Inspection".)
EOP sensorF673F1587Battery current sensorF761 92 CMP sensor (PHASE) (bank 1)F451 92 CMP sensor (PHASE) (bank 2)F461Is the inspection result normal?YES >> GO TO 4.NO >> Repair short to ground or short to power in harness or connectors.4.CHECK COMPONENTSCheck the following.• Battery current sensor (Refer to EC-333, "Component Inspection".)• Camshaft position sensor (PHASE) (bank 1) (Refer to EC-303, "Component Inspection".)
F15 Oracle CMP sensor (PHASE) (bank 1) F45 1 92 CMP sensor (PHASE) (bank 2) F46 1 Is the inspection result normal? YES >> GO TO 4. NO >> Repair short to ground or short to power in harness or connectors. 4. CHECK COMPONENTS Check the following. • Battery current sensor (Refer to EC-333, "Component Inspection".) • Camshaft position sensor (PHASE) (bank 1) (Refer to EC-303, "Component Inspection".)
92 CMP sensor (PHASE) (bank 2) F46 1 s the inspection result normal? YES >> GO TO 4. NO >> Repair short to ground or short to power in harness or connectors. 4.CHECK COMPONENTS Check the following. • Battery current sensor (Refer to EC-333, "Component Inspection".) • Camshaft position sensor (PHASE) (bank 1) (Refer to EC-303, "Component Inspection")
CMP sensor (PHASE) (bank 2) F46 1 s the inspection result normal? YES >> GO TO 4. NO >> Repair short to ground or short to power in harness or connectors. 4.CHECK COMPONENTS Check the following. Battery current sensor (Refer to EC-333, "Component Inspection".) Camshaft position sensor (PHASE) (bank 1) (Refer to EC-303, "Component Inspection")
YES >> GO TO 4. NO >> Repair short to ground or short to power in harness or connectors. • CHECK COMPONENTS heck the following. Battery current sensor (Refer to <u>EC-333, "Component Inspection"</u> .) Camshaft position sensor (PHASE) (bank 1) (Refer to <u>EC-303, "Component Inspection"</u> .)
Camshaft position sensor (PHASE) (bank 2) (Refer to <u>EC-303, "Component Inspection"</u> Engine oil pressure sensor (Refer to <u>EC-361, "Component Inspection"</u> .) Refrigerant pressure sensor (Refer to <u>EC-495, "Diagnosis Procedure"</u> .) <u>a the inspection result normal?</u> YES >> Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u> . NO >> Replace malfunctioning components.
 D.CHECK APP SENSOR 2 GROUND CIRCUIT FOR OPEN AND SHORT Turn ignition switch OFF. Disconnect ECM harness connector. Check the continuity between APP sensor harness connector and ECM harness conr
APP sensor ECM
Connector Terminal Connector Terminal Continuity

YES >> GO TO 6.

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

 ${f 0}.$ CHECK APP SENSOR 2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between APP sensor harness connector and ECM harness connector.

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P2127, P2128 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

APP	sensor	ECM		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E110	6	E19	143	Existed

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

Is the inspection result normal?

YES >> GO TO 7.

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

7.CHECK APP SENSOR

Check APP sensor. Refer to EC-454, "Component Inspection".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".

NO >> Replace accelerator pedal assembly. Refer to <u>ACC-4, "Exploded View"</u>.

Component Inspection

INFOID:000000012406624

1. CHECK ACCELERATOR PEDAL POSITION SENSOR

1. Reconnect all harness connectors disconnected.

2. Turn ignition switch ON.

3. Check the voltage between ECM harness connector terminals under the following conditions.

	EC	Μ					
	+		_	Cond	lition	Voltage (V)	
Connector	Terminal	Connector	Terminal				
	150		151		Fully released	0.5 - 1.0	
E19	(APP sensor 1 sig- nal)	E19	(Sensor ground)	(Sensor ground)	Accelerator pedal	Fully depressed	4.2 - 4.8
E19	143	E 19	144	Accelerator pedar	Fully released	0.25 - 0.50	
	(APP sensor 2 sig- nal)		(Sensor ground)		Fully depressed	2.0 - 2.5	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace accelerator pedal assembly. Refer to <u>ACC-4, "Exploded View"</u>.

P2135 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P2135 TP SENSOR

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P2135 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. Refer to <u>EC-379, "DTC Logic"</u>.

DTC No.	Trouble diagnosis name	DTC de	tecting condition	Possible cause
P2135	Throttle position sensor circuit range/perfor- mance		t voltage is sent to ECM signals from TP sensor 1	 Harness or connector (TP sensor 1 or 2 circuit is open or short- ed.) Electric throttle control actuator (TP sensor 1 or 2)
DTC CON	FIRMATION PROCI	EDURE		
1.PRECO	NDITIONING			
ing the nex 1. Turn ig 2. Turn ig 3. Turn ig TESTING (t test. gnition switch OFF and gnition switch ON. gnition switch OFF and CONDITION:	l wait at least 10 l wait at least 10	seconds. seconds.	s perform the following before conduct- oltage is more than 8 V at idle.
>:	> GO TO 2.			
2.perfo	RM DTC CONFIRMAT	TION PROCEDU	RE	
1. Start e 2. Check	ngine and let it idle for	1 second.		
z. Check Is DTC det				
YES >>	> Proceed to EC-455,	"Diagnosis Proce	edure".	
NO >>	> INSPECTION END			
Diagnosi	is Procedure			INFOID:000000012406626
1 .снеск	THROTTLE POSITIC	N SENSOR PO	WER SUPPLY	
	nect electric throttle c			
2. Turn ig	nition switch ON.			
3. Check	the voltage between e	electric throttle co	ontrol actuator harness	s connector and ground.
Electric	throttle control actuator			
Connec	tor Terminal	Ground	Voltage (V)	
F50	5	Ground	Approx. 5	
	action regult normal?			
Is the inspe	ection result normal?			
Is the inspe YES >>	> GO TO 2.	phort to ground a	r short to nower in her	rpass or connectors
Is the inspective view of the second		-	•	

 Check the continuity between electric throttle control actuator harness connector and ECM harness connector.

EC-455

INFOID:000000012406625

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P2135 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

Electric throttle	control actuator	E	CM	Continuity
Connector	Terminal	Connector	Terminal	Continuity
F50	4	F15	75	Existed

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

Is the inspection result normal?

YES >> GO TO 3.

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

 $\mathbf{3}$. CHECK THROTTLE POSITION SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between electric throttle control actuator harness connector and ECM harness connector.

Electric throttle	control actuator	E	CM	Continuity
Connector	Terminal	Connector	Terminal	Continuity
F50	3	F15	72	Existed
1 50	6	115	71	LAISteu

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

Is the inspection result normal?

YES >> GO TO 4.

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

4.CHECK THROTTLE POSITION SENSOR

Check throttle position sensor. Refer to EC-456. "Component Inspection".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".

NO >> Replace electric throttle control actuator. Refer to <u>EM-29</u>, "<u>Exploded View</u>".

Component Inspection

INFOID:000000012406627

1. CHECK THROTTLE POSITION SENSOR

- 1. Turn ignition switch OFF.
- 2. Reconnect all harness connectors disconnected.
- 3. Perform <u>EC-148, "Description"</u>.
- 4. Turn ignition switch ON.
- 5. Shift selector lever position to D.
- 6. Check the voltage between ECM harness connector terminals under the following conditions.

	EC	М							
	+		_	Condit	ion	Voltage			
Connector	Terminal	Connector	Terminal						
	71				Fully released	More than 0.36 V			
F15	(TP sensor 1 signal)	E15	E15	E15	F15	75	Accelerator pedal	Fully depressed	Less than 4.75 V
115	72	115	(Sensor ground)		Fully released	Less than 4.75 V			
	(TP sensor 2 signal)				Fully depressed	More than 0.36 V			

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace electric throttle control actuator. Refer to EM-29, "Exploded View".

P2138 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P2138 APP SENSOR

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P2138 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. Refer to <u>EC-379, "DTC Logic"</u>.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P2138	Accelerator pedal posi- tion sensor circuit range/ performance	Rationally incorrect voltage is sent to ECM compared with the signals from APP sensor 1 and APP sensor 2.	 Harness or connector (APP sensor 1 or 2 circuit is open or shorted.) [CMP sensor (PHASE) circuit is shorted.] (Refrigerant pressure sensor circuit is shorted.) (Battery current sensor circuit is shorted.) (EOP sensor circuit is shorted.) Accelerator pedal position sensor (APP sensor 1 or 2) Camshaft position (CMP) sensor (PHASE) Battery current sensor Engine oil pressure (EOP) sensor Refrigerant pressure sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

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

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 8 V at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine and let it idle for 1 second.
- 2. Check DTC.

Is DTC detected?

- YES >> Proceed to EC-457, "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

1.CHECK APP SENSOR 1 POWER SUPPLY

1. Disconnect accelerator pedal position (APP) sensor harness connector.

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

APP s	sensor	Ground	Voltage (V)
Connector	Terminal	Ground	voltage (v)
E110	4	Ground	Approx. 5

Is the inspection result normal?

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INFOID:000000012406629

P2138 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

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

2.CHECK APP SENSOR 2 POWER SUPPLY

- 1. Turn ignition switch ON.
- 2. Check the voltage between APP sensor harness connector and ground.

APP	sensor	Ground	Voltage (V)
Connector	Terminal	Ground	voltage (v)
E110	5	Ground	Approx. 5

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 3.

3.CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.

2. Disconnect ECM harness connector.

3. Check the continuity between APP sensor harness connector and ECM harness connector.

APP	sensor	E	СМ	Continuity
Connector	Terminal	Connector	Terminal	Continuity
E110	5	E19	142	Existed

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit.

4.CHECK SENSOR POWER SUPPLY CIRCUIT

Check harness for short to power and short to ground, between the following terminals.

EC	CM	Sensor		
Connector	Terminal	Name	Connector	Terminal
E19	142	APP sensor 2	E110	5
F14	18	Refrigerant pressure sensor	E300	1
F 14	10	EOP sensor	F67	3
	87	Battery current sensor	F76	1
F15	92	CMP sensor (PHASE) (bank 1)	F45	1
	92	CMP sensor (PHASE) (bank 2)	F46	1

Is the inspection result normal?

YES >> GO TO 5.

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

5.CHECK COMPONENTS

Check the following.

- Battery current sensor (Refer to <u>EC-333, "Component Inspection"</u>.)
- Camshaft position sensor (PHASE) (bank 1) (Refer to EC-303, "Component Inspection".)
- Camshaft position sensor (PHASE) (bank 2) (Refer to EC-303. "Component Inspection".)
- Engine oil pressure sensor (Refer to EC-361, "Component Inspection".)
- Refrigerant pressure sensor (Refer to <u>EC-495, "Diagnosis Procedure"</u>.)

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".

NO >> Replace malfunctioning components.

 ${f 0}$. CHECK APP SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.

P2138 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

2. Disconnect ECM harness connector.

3. Check the continuity between APP sensor harness connector and ECM harness connector.

APP :	sensor	EC	CM	Continuity
Connector	Terminal	Connector	Terminal	Continuity
E110	1	E19	144	Existed
EIIU	2	E19	151	Existed

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

Is the inspection result normal?

YES >> GO TO 7.

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

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

1. Check the continuity between APP sensor harness connector and ECM harness connector.

APP	sensor	ECM		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E110	3	E19	150	Existed
EIIO	6	E19	143	Existed

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

Is the in	spection result normal?	
YES	>> GO TO 8.	

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

8. CHECK APP SENSOR

Check APP sensor. Refer to <u>EC-459</u>, "Component Inspection".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u>.

NO >> Replace accelerator pedal assembly. Refer to <u>ACC-4, "Exploded View"</u>.

Component Inspection

1. CHECK ACCELERATOR PEDAL POSITION SENSOR

1. Reconnect all harness connectors disconnected.

2. Turn ignition switch ON.

3. Check the voltage between ECM harness connector terminals under the following conditions.

ECM							
+ _			+		Conc	lition	Voltage (V)
Connector	Terminal	Connector	Terminal				
	150		151		Fully released	0.5 - 1.0	
E19	(APP sensor 1 sig- nal)	E19	(Sensor ground)	Accelerator pedal	Fully depressed	4.2 - 4.8	
E19	143	E19	144		Fully released	0.25 - 0.50	
	(APP sensor 2 sig- nal)		(Sensor ground)		Fully depressed	2.0 - 2.5	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace accelerator pedal assembly. Refer to <u>ACC-4, "Exploded View"</u>.

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< DTC/CIRCUIT DIAGNOSIS >

P219A, P219B AIR FUEL RATIO

DTC Logic

INFOID:000000012406631

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DTC DETECTION LOGIC **NOTE**:

If DTC P219A or P219B is displayed with other DTC, first perform the trouble diagnosis for the other DTC. Refer to <u>EC-103, "DTC Index"</u>.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P219A	AIR FUEL RATIO IMBALANCE B1 (Air-fuel ratio imbalance bank 1)		Fuel injectorExhaust gas leaks
P219B	AIR FUEL RATIO IMBALANCE B2 (Air-fuel ratio imbalance bank 2)	ECM detects a lean/rich air fuel ratio state in any cylinder for a specified length of time.	 Incorrect fuel pressure Mass air flow sensor Intake air leaks Lack of fuel Incorrect PCV hose connection Improper spark plug Insufficient compression The fuel injector circuit is open or shorted ignition coil The ignition signal circuit is open or shorted

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING-1

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

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

NOTE:

Before performing the following procedure, confirm that battery voltage is 11 V or more at idle.

>> GO TO 2.

2. PRECONDITIONING-2

- 1. Turn ignition switch ON.
- 2. Clear the mixture ratio self-learning value. Refer to EC-151. "Description".

Will CONSULT be used?

- YES >> GO TO 3.
- NO >> GO TO 6.

3.PERFORM DTC CONFIRMATION PROCEDURE-1

- 1. Turn ignition switch ON.
- 2. Select "COOLAN TEMP/S" in "DATA MONITOR" mode of "ENGINE" using CONSULT.
- 3. Start engine.
- 4. Make sure that "COOLAN TEMP/S" indicates more than 80°C (176°F).

>> GO TO 4.

4.PERFORM DTC CONFIRMATION PROCEDURE-2

With CONSULT

- 1. Select "SYSTEM 1 DIAGNOSIS B B1" and "SYSTEM 1 DIAGNOSIS A B1" in "DATA MONITOR" mode of "ENGINE" using CONSULT.
- 2. Drive vehicle under the following conditions for at least 5 consecutive seconds. CAUTION:

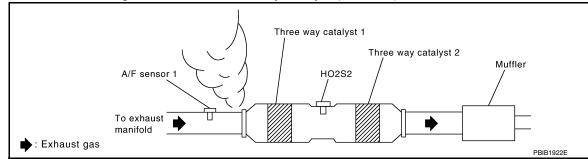


Always drive vehicle at a safe speed. А ENG SPEED 1,000 - 1,600rpm COOLAN TEMP/S More than 80°C (176°F) EC **B/FUEL SCHDL** 5 - 12 msec Selector lever D position SYSTEM 1 DIAGNOSIS B B1 PRSENT NOTE: Drive the vehicle at approximately 88 km/h (55MPH) allows easy diagnosis. Keep the accelerator pedal as possible during crusing. D Check "SYSTEM 1 DIAGNOSIS A B1" indication. Is "CMPLT" displayed? Ε YES >> GO TO 5. NO >> GO TO 2. 5. PERFORM DTC CONFIRMATION PROCEDURE-3 Check 1st trip DTC. Is 1st trip DTC detected? YES >> Proceed to EC-461, "Diagnosis Procedure". NO >> INSPECTION END $\mathbf{6}$.PERFORM DTC CONFIRMATION PROCEDURE-4 Н Without CONSULT Start the engine and warm it up to normal operating temperature. 1. Drive vehicle under the following conditions for at least 5 consecutive seconds. 2. CAUTION: Always drive vehicle at a safe speed. Engine speed 1,000 - 1,600 rpm Calculated load value 27 - 63 % Selector lever D position Κ NOTE: • Drive the vehicle at approximately 88 km/h (55MPH) allows easy diagnosis. Keep the accelerator pedal as possible during crusing. Check 1st trip DTC. Is 1st trip DTC detected? YES >> Proceed to EC-461, "Diagnosis Procedure". M >> INSPECTION END NO Diagnosis Procedure INFOID:000000012406632 Ν **1.**CHECK FOR INTAKE AIR LEAK 1. Stop engine and check the following for connection. Air duct Vacuum hoses PCV hose Ρ Intake air passage between air duct to intake manifold 2. Start engine and let it idle. 3. Listen for an intake air leak after the mass air flow sensor. Is the inspection result normal? YES >> GO TO 2. NO >> Repair or replace error-detected parts. 2.CHECK EXHAUST GAS LEAK

P219A, P219B AIR FUEL RATIO

< DTC/CIRCUIT DIAGNOSIS >

- 1. Stop engine and visually check exhaust tube, three way catalyst and muffler for dents connection.
- 2. Start engine and let it idle.
- 3. Listen for an exhaust gas leak before three way catalyst (manifold).



Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3.CHECK FUEL PRESSURE

- 1. Release fuel pressure to zero. Refer to EC-153, "Work Procedure".
- 2. Check fuel pressure. Refer to EC-153, "Work Procedure".

Is the inspection result normal?

- YES >> GO TO 4.
- NO >> GO TO 9.

4.CHECK MASS AIR FLOW SENSOR

With CONSULT

Check "MASS AIR FLOW" in "DATA MONITOR" mode of "ENGINE" using CONSULT. For specification, refer to <u>EC-514, "Mass Air Flow Sensor"</u>.

. With GST

Check mass air flow sensor signal in Service \$01 using GST. For specification, refer to <u>EC-514</u>, "Mass Air Flow Sensor".

Is the inspection result normal?

- YES >> GO TO 5.
- NO >> Check connectors for rusted terminals or loose connections in the mass air flow sensor circuit or grounds. Refer to <u>EC-201, "Diagnosis Procedure"</u>.

5. CHECK FUNCTION OF FUEL INJECTOR-1

With CONSULT

- 1. Start engine.
- 2. Perform "POWER BALANCE" in "ACTIVE TEST" mode of "ENGINE" using CONSULT.
- 3. Check that each circuit produces a momentary engine speed drop.

Without CONSULT

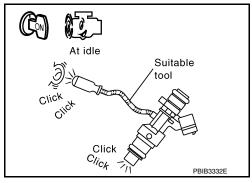
- 1. Let engine idle.
- 2. Listen to each fuel injector operating sound.

Clicking noise should be heard.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Perform trouble diagnosis for fuel injector, refer to <u>EC-</u> <u>480, "Component Inspection"</u>.



6.CHECK FUNCTION OF FUEL INJECTOR-2

CAUTION:

P219A, P219B AIR FUEL RATIO

< DTC/CIRCUIT DIAGNOSIS >

Perform the following procedure in a place with no combustible objects and good ventilation.

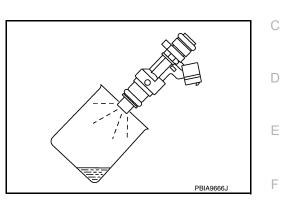
- 1. Turn ignition switch OFF.
- 2. Confirm that the engine is cooled down and there are no fire hazards near the vehicle.
- 3. Disconnect all fuel injector harness connectors.
- 4. Remove fuel tube assembly. Refer to <u>EM-49</u>, "<u>Removal and Installation</u>". Keep fuel hose and all fuel injectors connected to fuel tube.
- 5. Disconnect all ignition coil harness connectors.
- 6. Prepare pans or saucers under each fuel injector.
- 7. Crank engine for approximately 3 seconds.

• Fuel should be sprayed evenly for each fuel injector.

• Fuel must not drip from the tip of fuel injector.

Is the inspection result normal?

NO >> Replace fuel injector. Refer to <u>EM-49</u>, "<u>Removal and</u> <u>Installation</u>".



7. CHECK FUNCTION OF IGNITION COIL-1

CAUTION:

Perform the following steps in a well-ventilated area with no combustibles.

- 1. Turn ignition switch OFF.
- 2. Remove fuel pump fuse from IPDM E/R to release fuel pressure. **NOTE:**

CONSULT must not be used to release fuel pressure. It develops again during the following steps, if released by using CONSULT.

- 3. Start the engine.
- 4. After an engine stall, crank the engine two or three times to release all the fuel pressure.
- 5. Turn ignition switch OFF.
- 6. Disconnect all the harness connectors of ignition coil to prevent electric discharge from occurring in ignition coil.
- 7. Remove ignition coil assembly and spark plug of cylinder. Refer to EM-54, "Removal and Installation".
- 8. Crank engine for 5 seconds or more to remove combustion gas in the cylinder.
- 9. Connect spark plug and harness connector to ignition coil.
- 10. Allow a 13-17mm (0.52-0.66 in) spacing between spark plug and grounded metal portion as shown in the figure to fix the ignition coil with a rope or an equivalent.
- 11. Crank the engine for approximately 3 seconds to see if sparking occurs between spark plug and the grounded metal portion.

Spark should be generated.

CAUTION:

- The discharge voltage becomes 20 kV or higher. Therefore, always stay away from the spark plug and ignition coil at least 50 cm (19.7 in) during the inspection.
- Leaving a space of more than 17mm (0.66 in) may damage the ignition coil.

NOTE:

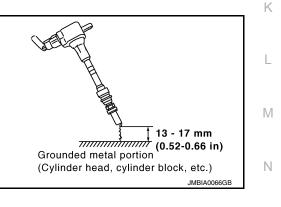
When the gap is less than 13 mm (0.52 in), a the spark might be generated even if the coil is malfunctioning.

Is the inspection result normal?

YES >> GO TO 8. NO >> GO TO 10.

8.CHECK COMPRESSION PRESSURE

Check compression pressure. Refer to <u>EM-24, "Inspection"</u>. <u>Is the inspection result normal?</u>



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P219A, P219B AIR FUEL RATIO

< DTC/CIRCUIT DIAGNOSIS >

- YES >> Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u>.
- NO >> Check pistons, piston rings, valves, valve seats and cylinder head gaskets.

9. DETECT MALFUNCTIONING PART

Check fuel hoses and fuel tubes for clogging.

Is the inspection result normal?

- YES >> Replace fuel filter and fuel pump assembly. Refer to FL-6, "Removal and Installation".
- NO >> Repair or replace error-detected parts.

10. CHECK FUNCTION OF IGNITION COIL-2

- 1. Turn ignition switch OFF.
- 2. Disconnect spark plug and connect a non-malfunctioning spark plug.
- 3. Crank engine for approximately 3 seconds, and recheck whether spark is generated between the spark plug and the grounded metal portion.

Spark should be generated.

Is the inspection result normal?

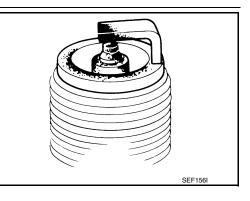
- YES >> GO TO 11.
- NO >> Check ignition coil, power transistor and their circuits. Refer to <u>EC-484</u>, "Component Function <u>Check"</u>.

11.CHECK SPARK PLUG

Check the initial spark plug for fouling, etc.

Is the inspection result normal?

- YES >> 1. Repair or clean spark plug. Refer to <u>EM-17</u>, <u>"Removal and Installation"</u>.
 - 2. GO TO 12.
- NO >> Replace spark plug(s) with standard type one(s). For spark plug type, refer to <u>EM-133, "Spark Plug"</u>.



12. CHECK FUNCTION OF IGNITION COIL-3

- 1. Reconnect the initial spark plugs.
- 2. Crank engine for approximately 3 seconds, and recheck whether spark is generated between the spark plug and the grounded portion.

Spark should be generated.

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u>.
- NO >> Replace spark plug(s) with standard type one(s). For spark plug type, refer to <u>EM-133, "Spark</u> <u>Plug"</u>.

P2610 ECM INTERNAL TIMER

< DTC/CIRCUIT DIAGNOSIS >

P2610 ECM INTERNAL TIMER

Description

This ECM contains a timer and measures time between an ignition switch OFF and the next ignition switch ON. This enables the judging of the state of engine cooling at an engine start.

DTC Logic

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DTC DETECTION LOGIC

 3. Turn ignition switch OFF and wait at least 10 seconds. TESTING CONDITION: Before performing the following procedure, confirm that battery voltage is 12 V or more under ignition switch OFF condition. >> GO TO 3. 3. PERFORM DTC CONFIRMATION PROCEDURE-I 1. Turn ignition switch ON and wait at least 190 seconds. 2. Check 1st trip DTC. Is 1st trip DTC detected? YES >> Proceed to EC-466. "Diagnosis Procedure". NO >> INSPECTION END 4. PRECONDITIONING 1. Turn ignition switch OFF and wait at least 10 seconds. 2. Turn ignition switch OFF and wait at least 10 seconds. 2. Turn ignition switch OFF and wait at least 10 seconds. 2. Turn ignition switch OFF and wait at least 10 seconds. 2. Turn ignition switch OFF and wait at least 10 seconds. 3. Turn ignition switch OFF and wait at least 10 seconds. TESTING CONDITIONING 3. Turn ignition switch OFF and wait at least 10 seconds. TESTING CONDITION: Before performing the following procedure, confirm that battery voltage is 12 V or more under ignition switch OFF condition. 	DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
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tis necessary to erase permanent DTC? YES >> GO TO 4. NO >> GO TO 2. 2.PRECONDITIONING I. Turn ignition switch OFF and wait at least 10 seconds. 2. Turn ignition switch OFF and wait at least 10 seconds. 3. Turn ignition switch OFF and wait at least 10 seconds. TESTING CONDITION: Before performing the following procedure, confirm that battery voltage is 12 V or more under ignition switch OFF condition. >> GO TO 3. 3. PERFORM DTC CONFIRMATION PROCEDURE-I I. Turn ignition switch ON and wait at least 190 seconds. 2. Check 1st trip DTC. s 1st trip DTC detected? YES >> Proceed to EC-466. "Diagnosis Procedure". NO >> INSPECTION END 4.PRECONDITIONING I. Turn ignition switch OFF and wait at least 10 seconds. 2. Turn ignition switch OFF and wait at least 10 seconds. 2. Turn ignition switch OFF and wait at least 10 seconds. 3. Turn ignition switch OFF and wait at least 10 seconds. TESTING CONDITION: Before performing the following procedure, confirm that battery voltage is 12 V or more under ignition switch OFF condition. Before performing the following procedure, check that fuel level is between 2/8 and 7/8.			URE	
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>> GO TO 5.	Is 1st trip YES NO 4. PREC 1. Turn 2. Turn	DTC detected? >> Proceed to EC-466, "Di >> INSPECTION END ONDITIONING ignition switch OFF and wa ignition switch ON.	agnosis Procedure". ait at least 10 seconds.	
	Is 1st trip YES NO 4.PREC 1. Turn 2. Turn 3. Turn TESTING • Before tion sw	DTC detected? >> Proceed to <u>EC-466</u> , "Di >> INSPECTION END ONDITIONING ignition switch OFF and wa ignition switch OFF and wa CONDITION: performing the following vitch OFF condition.	agnosis Procedure". ait at least 10 seconds. ait at least 10 seconds. g procedure, confirm that battery volt	

5.PERFORM DTC CONFIRMATION PROCEDURE-I

1. Turn ignition switch ON and wait at least 190 seconds.

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P2610 ECM INTERNAL TIMER

< DTC/CIRCUIT DIAGNOSIS >

2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to EC-466, "Diagnosis Procedure".

NO >> GO TO 6.

6.PERFORM DTC CONFIRMATION PROCEDURE-II

CAUTION:

To start this self-diagnosis, the conditions listed bellow are required to be satisfied. Perform the following steps to satisfy the conditions.

- Engine coolant temperature decrease by 55°C (131°F) or more during the time between an ignition switch OFF (after engine warm-up) and the second ignition switch ON.
- A fuel temperature at the second ignition switch ON is -5°C (23°F) or more and less than 35°C (95°F).

• The temperature difference between engine coolant and fuel is 5°C (41°F) or more.

NOTE:

This self-diagnosis is not performed if the distance traveled is extremely short.

- 1. Turn ignition switch ON.
- 2. Start engine and warm it up to normal operating temperature.
- 3. Turn ignition switch OFF and soak the vehicle for at least 12 hours. CAUTION:
 - Never turn ON the ignition switch during soaking.
 - Never open the fuel filler cap and perform refueling during soaking.
- 4. Turn ignition switch ON and wait at least 190 seconds.
- 5. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to EC-466, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000012406635

1.CHECK ECM POWER SUPPLY AND GROUND CIRCUIT

Check ECM power supply and ground circuit. Refer to EC-175, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2. CHECK SELF-DIAGNOSTIC RESULT

Check that DTCs related to the fuel system and the cooling system are not detected.

Is the inspection result normal?

YES >> Check the DTC. Refer to <u>EC-73, "CONSULT Function"</u>.

NO >> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Erase DTC.

2. Perform DTC Confirmation Procedure again. Refer to <u>EC-465, "DTC Logic"</u>.

Is the 1st trip DTC P2610 displayed again?

YES >> Replace ECM. Refer to EC-513, "Removal and Installation".

NO >> INSPECTION END

	UIT DIAGNC	SIS >				N SWITCH		[VQ35DE]
BRAKE F	PEDAL PO	OSITIO	N SW	ITCH				
Compone	nt Function	Check					li I	NFOID:000000012406636
	RAKE PEDAI							
		FUSITIC						
2. Select "E	ition switch Of BRAKE SW1" BRAKE SW1"	in "DATA I						
Monitor item		Condition		Ind	ication			
			depressed					
BRAKE SW1	Brake pedal	Fully rel			ON			
	CONSULT ition switch Of ne voltage betw		1 harnes	s conne	ctor termin	als.		
	EC							
Connector		+		-	(Condition	Voltage	
		minal	10	erminal		Slightly depressed	Approx. 0 V	
E19	1 brake pedal pos)	40 ition switch s	signal)	147	Brake pedal	Slightly depressed Fully released	Battery voltage	<u>, </u>
	NSPECTION Proceed to <u>EC</u>	2-467, "Dia	ignosis F	Procedur	<u>re"</u> .			
Diagnosis	Procedure						li I	NFOID:0000000012406637
	Procedure RAKE PEDAI		N SWIT	CH POV	VER SUPF	PLY CIRCUIT	II.	NFOID:000000012406637
CHECK B	RAKE PEDAI ition switch Of ect brake peda ition switch Of	_ POSITIC =F. al position N.	switch h	arness	connector.	PLY CIRCUIT		VFOID:000000012406637
CHECK B . Turn igni . Disconno . Turn igni . Check th	RAKE PEDAI ition switch Of ect brake peda ition switch Of	POSITIC F. al position N. ween brak	switch h e pedal	position	connector.			VFOID:000000012406637
CHECK B . Turn igni . Disconne . Turn igni . Check th	RAKE PEDAI ition switch Of ect brake peda ition switch Of ne voltage betw	_ POSITIC =F. al position N.	switch h	position	connector.			VFOID:000000012406637
CHECK B . Turn igni . Disconne . Turn igni . Check th Brake pedal p Connector E109	RAKE PEDAI ition switch Of ect brake peda ition switch Of ne voltage betw position switch Terminal	POSITIC F. al position N. ween brak Ground Ground	switch h e pedal	position	connector.			VFOID:000000012406637
CHECK B CUTURN igni Substantiation Cuturn igni Cuturn	RAKE PEDAI ition switch Of ect brake peda ition switch Of ne voltage betw position switch Terminal 1 tion result nor GO TO 3. GO TO 3. GO TO 2. RAKE PEDAI ition switch Of ect fuse block	POSITIC FF. al position N. ween brak Ground Ground Mal? - POSITIC FF. (J/B) harn	switch h e pedal j Voltag Battery vo DN SWIT	arness of position ge oltage	connector. switch hari	ness connector an	d ground.	
1.CHECK B . Turn igni 2. Disconne 3. Turn igni 4. Check th Brake pedal p Connector E109 s the inspect YES NO 2.CHECK B I. Turn igni 2.CHECK B	RAKE PEDAI ition switch Of ect brake peda ition switch Of ne voltage betw position switch Terminal 1 tion result nor GO TO 3. GO TO 3. GO TO 2. RAKE PEDAI ition switch Of ect fuse block ne continuity b	POSITIC FF. al position N. ween brak Ground Ground Mal? - POSITIC FF. (J/B) harn	switch h e pedal j Voltag Battery vo DN SWIT	arness of position ge oltage	connector. switch hari	ness connector an	d ground.	
1.CHECK B . Turn igni 2. Disconnel 3. Turn igni 3. Turn igni 4. Check th Brake pedal p Connector E109 s the inspect YES YES 2.CHECK B I. Turn igni 2. CHECK B I. Turn igni 2. Check th Connector	RAKE PEDAI ition switch Of ect brake peda ition switch Of ne voltage betw position switch Terminal 1 tion result nor GO TO 3. GO TO 3. GO TO 2. RAKE PEDAI ition switch Of ect fuse block ne continuity b	POSITIC FF. al position N. ween brak Ground Ground Mal? - POSITIC FF. (J/B) harn etween brac	switch h e pedal j Voltag Battery vo DN SWIT	arness of position ge oltage	connector. switch harr	ness connector an	d ground.	
1.CHECK B . Turn igni 2. Disconnel 3. Turn igni 3. Turn igni 4. Check th Brake pedal p Connector E109 s the inspect YES YES 2.CHECK B I. Turn igni 2. CHECK B I. Turn igni 2. Check th Connector	RAKE PEDAI ition switch Of ect brake peda ition switch Of ne voltage betw position switch Terminal 1 tion result nor GO TO 3. GO TO 3. GO TO 2. RAKE PEDAI ition switch Of ect fuse block ne continuity b or.	POSITIC FF. al position N. ween brak Ground Ground Mal? - POSITIC FF. (J/B) harn etween brac	switch h e pedal j Voltag Battery vo DN SWIT ness conta ake peda	arness of position ge oltage	connector. switch harr WER SUPF on switch ha	PLY CIRCUIT	d ground.	

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit.

BRAKE PEDAL POSITION SWITCH

< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair or replace error-detected parts.

${f 3}.$ CHECK BRAKE PEDAL POSITION SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check the continuity between brake pedal position switch harness connector and ECM harness connector.

Brake pedal position switch		E	СМ	Continuity
Connector	Terminal	Connector	Terminal	Continuity
E109	2	E19	140	Existed

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

Is the inspection result normal?

YES >> GO TO 4.

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

4.CHECK BRAKE PEDAL POSITION SWITCH

Check brake pedal position switch. Refer to <u>EC-468</u>, "Component Inspection (Brake Pedal Position Switch)". Is the inspection result normal?

- YES >> Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u>.
- NO >> Replace brake pedal position switch. Refer to <u>BR-20, "Exploded View"</u>.

Component Inspection (Brake Pedal Position Switch)

INFOID:000000012406638

1.CHECK BRAKE PEDAL POSITION SWITCH-I

- 1. Turn ignition switch OFF.
- 2. Disconnect brake pedal position switch harness connector.
- 3. Check the continuity between brake pedal position switch terminals under the following conditions.

Terminals		Condition	Continuity
1 and 2	Brake pedal	Fully released	Existed
	Diake pedal	Slightly depressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2. CHECK BRAKE PEDAL POSITION SWITCH-II

- 1. Adjust brake pedal position switch installation. Refer to <u>BR-9</u>, "Inspection and Adjustment".
- 2. Check the continuity between brake pedal position switch terminals under the following conditions.

Terminals		Condition	Continuity
1 and 2	Brake pedal	Fully released	Existed
		Slightly depressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace brake pedal position switch. Refer to <u>BR-20, "Exploded View"</u>.

ASCD INDICATOR

< DTC/CIRCUIT DIAGNOSIS >

ASCD INDICATOR

Component Function Check

1. CHECK ASCD INDICATOR FUNCTION

Check ASCD indicator under the following conditions.

ASCD INDICATOR		CONDITION	
CRUISE	Ignition switch: ON	MAIN switch: Pressed at the 1st time →at the 2nd time	$ON\toOFF$
s the inspection result no	ormal?		
YES >> INSPECTION			
NO >> Proceed to \underline{E}	C-469, "Diagnosis Proced	<u>dure"</u> .	
Diagnosis Procedur	e		INFOID:000000012406640
1.снеск отс			
Check that DTC UXXXX	is not displayed		
s the inspection result no			
YES >> GO TO 2.			
NO >> Perform trou	ble diagnosis for DTC UX	XXX.	
2. CHECK COMBINATIO	ON METER FUNCTION		
Check combination mete	r function. Refer to MWI-3	6, "CONSULT Function".	
s the inspection result no	ormal?		
YES >> GO TO 3.			
• • •	blace malfunctioning part.		
3. CHECK INTERMITTE			
	nt. Refer to <u>GI-41, "Interm</u>	ittent Incident".	
s the inspection result no			
	bination meter. Refer to <u>N</u> blace error-detected parts.		

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< DTC/CIRCUIT DIAGNOSIS >

COOLING FAN

Component Function Check

1. CHECK COOLING FAN FUNCTION

With CONSULT

- 1. Turn ignition switch ON.
- 2. Perform "COOLING FAN" in "ACTIVE TEST" mode with CONSULT.
- 3. Check that cooling fan operates at each speed.

Without CONSULT

- 1. Perform IPDM E/R auto active test and check cooling fan motors operation, refer to <u>PCS-10. "Diagnosis</u> <u>Description"</u>.
- 2. Check that cooling fan operates at each speed.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to <u>EC-470, "Diagnosis Procedure"</u>.

Diagnosis Procedure

INFOID:000000012406642

1. CHECK COOLING FAN RELAY POWER SUPPLY

- 1. Turn ignition switch OFF.
- 2. Disconnect cooling fan relays-2, -3.
- 3. Turn ignition switch ON.
- 4. Check the voltage between cooling fan relays-2, -3 harness connectors and ground.

Cooling fan relay		Ground	Voltage	
Connector	Terminal	Ground	voltage	
E57	2	Ground		
(cooling fan relay-2)	5		Battery voltage	
E59	2			
(cooling fan relay-3)	5			

Is the inspection result normal?

YES >> GO TO 2.

NO >> Perform the trouble diagnosis for power supply circuit.

2.CHECK COOLING FAN RELAY OUTPUT SIGNAL CIRCUIT

1. Turn ignition switch OFF.

2. Disconnect IPDM E/R harness connectors.

 Check the continuity between cooling fan relay-2, -3 harness connectors and IPDM E/R harness connector.

Cooling fan re	lay	IPDN	II E/R	Continuity
Connector	Terminal	Connector	Terminal	Continuity
E57 (cooling fan relay-2)	1	E11	42	Existed
E59 (cooling fan relay-3)	1	E10	34	Existed

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

Is the inspection result normal?

YES >> GO TO 3.

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

3.CHECK COOLING FAN MOTOR POWER SUPPLY

COOLING FAN

< DTC/CIRCUIT DIAGNOSIS >

- 1. Disconnect cooling fan motor-1 harness connector.
- 2. Check the voltage between cooling fan motor-1 harness connector and ground.

	Cooling fan r	motor-1		
	Connector	Terminal	Ground	Voltage
		renninal		
	E301	1	Cround	Dotton (voltage
	E301	2	Ground	Battery voltage
Is the in	nspection res	ult normal?		
YES	>> GO TO -	4.		
NO	>> Perform	the trouble dia	gnosis for pow	er supply circuit.

4. CHECK COOLING FAN MOTOR CIRCUIT-I

- 1. Disconnect cooling fan motor-2 harness connector.
- Check the continuity between cooling fan relay-2, -3 harness connectors and cooling fan motor-1, -2 harness connectors.

Cooling fan re	elay	Cooling fan	Cooling fan motor		F
Connector	Terminal	Connector	Terminal	Continuity	
E57	3	E302 (Cooling fan motor-2)	2		G
(cooling fan relay-2)	7	E301 (Cooling fan motor-1)	3	Existed	L
E59	3	E302 (Cooling fan motor-2)	1	Existed	Г
(cooling fan relay-3)	7	E301 (Cooling fan motor-1)	4		I

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

Is the inspection result normal?

YES >> GO TO 5.

NO >> Perform the trouble diagnosis for power supply circuit.

5. CHECK COOLING FAN MOTOR CIRCUIT-II

1. Check the continuity between IPDM E/R harness connector and cooling fan motor-1, -2 harness connector.

IPDN	1 E/R	Cooling fan	motor	Continuity	
Connector	Terminal	Connector	Terminal	- Continuity	
E10	35	E301 (Cooling fan motor-1)	4	– Existed	
EIU	38	E302 (Cooling fan motor-2)	1	- Existed	

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

Is the ins	pection result	normal?

YES >> GO TO 6.

NO >> Perform the trouble diagnosis for power supply circuit.

6.CHECK COOLING FAN MOTOR CIRCUIT-III

1. Check the continuity between cooling fan relay-2, -3 harness connectors and ground.

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COOLING FAN

< DTC/CIRCUIT DIAGNOSIS >

Cooling fan relay		Ground	Continuity	
Connector	Terminal	Ground	Continuity	
E57 (cooling fan relay-2)	6	Ground	Existed	
E59 (cooling fan relay-3)	6	Ground	LASIEU	

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

Is the inspection result normal?

YES >> GO TO 7.

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

7. CHECK COOLING FAN MOTOR CIRCUIT-IV

1. Check the continuity between cooling fan motor-2 harness connector and ground.

Cooling fan	Cooling fan motor-2		Continuity
Connector	Terminal	Ground	Continuity
E302	3	Ground	Existed
L302	4	Giouna	LAISIEU

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

Is the inspection result normal?

YES >> GO TO 8.

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

8.CHECK COOLING FAN RELAYS-2 AND -3

Check cooling fan relays-2 and -3. Refer to EC-473, "Component Inspection (Cooling Fan Relay)".

Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace malfunctioning cooling fan relay.

 ${f 9.}$ CHECK COOLING FAN MOTORS-1 AND -2

Check cooling fan motors-1 and -2. Refer to EC-472. "Component Inspection (Cooling Fan Motor)".

Is the inspection result normal?

YES >> GO TO 10.

NO >> Replace malfunctioning cooling fan motor. Refer to <u>CO-18. "Exploded View"</u>.

10.CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to <u>PCS-34</u>, "Exploded View".

NO >> Repair or replace error-detected parts.

Component Inspection (Cooling Fan Motor)

1.CHECK COOLING FAN MOTOR

1. Turn ignition switch OFF.

2. Disconnect cooling fan motor harness connector.

3. Supply cooling fan motor terminals with battery voltage and check operation.

COOLING FAN

< DTC/CIRCUIT DIAGNOSIS >

	Condition	Terminals		
	Condition	(+)	(-)	
Cooling fan motor	A	1	3 and 4	
		2	3 and 4	
		1 and 2	3	
		1 and 2	4	
		1, 2	3, 4	

Check that cooling fan speed of condition B is higher than that of A.

Is the inspection result normal?

- >> INSPECTION END YES
- NO >> Replace cooling fan motor. Refer to CO-18, "Exploded View".

Component Inspection (Cooling Fan Relay)

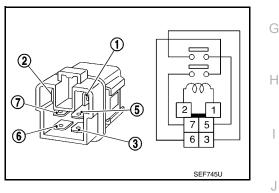
1. CHECK COOLING FAN RELAY

- 1. Disconnect cooling fan relays -2, -3 harness connectors.
- 2. Check continuity between cooling fan relay -2, -3 terminals under the following conditions.

Terminals	Conditions	Continuity
3 and 5	12 V direct current supply between terminals 1 and 2	Existed
6 and 7	No current supply	Not existed

<u>Is the inspection result normal?</u>

- YES >> INSPECTION END
- NO >> Replace cooling fan relay.



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ELECTRICAL LOAD SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

ELECTRICAL LOAD SIGNAL

Description

The electrical load signal (Headlamp switch signal, rear window defogger switch signal, etc.) is transferred via the CAN communication.

Component Function Check

1. CHECK REAR WINDOW DEFOGGER SWITCH FUNCTION

- 1. Turn ignition switch ON.
- 2. Connect CONSULT and select "DATA MONITOR" mode.
- Select "LOAD SIGNAL" and check indication under the following conditions. 3.

Monitor item	Condition	Indication	
LOAD SIGNAL Rear window defogger switch	Rear window defogger switch	ON	ON
	OFF	OFF	

Is the inspection result normal?

YES >> GO TO 2.

NO >> Proceed to EC-474, "Diagnosis Procedure".

2.check lighting switch function

Check "LOAD SIGNAL" indication under the following conditions.

Monitor item	Co	Indication	
LOAD SIGNAL	Lighting switch	ON at 2nd position	ON
LOAD SIGNAL	LOAD SIGNAL Lighting switch	OFF	OFF

Is the inspection result normal?

YFS >> GO TO 3.

NO >> Proceed to EC-474, "Diagnosis Procedure".

3.CHECK HEATER FAN CONTROL SWITCH FUNCTION

Select "HEATER FAN SW" and check indication under the following conditions.

Monitor item	Condition	Indication	
HEATER FAN SW	Heater fan control switch	ON	ON
	Treater fair control switch	OFF	OFF

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to EC-474, "Diagnosis Procedure".

Diagnosis Procedure

1.INSPECTION START

Confirm the malfunctioning circuit (rear window defogger, headlamp or heater fan). Refer to EC-474, "Component Function Check".

Which circuit is related to the incident?

Rear window defogger>>GO TO 2.

Headlamp>>GO TO 3.

Heater fan>>GO TO 4.

2.CHECK REAR WINDOW DEFOGGER SYSTEM

Check rear window defogger system. Refer to DEF-21, "Work Flow".

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ELECTRICAL LOAD SIGNAL

< DTC/CIRCUIT DIAGNOSIS >	[VQ35DE]
>> INSPECTION END	
3.CHECK HEADLAMP SYSTEM	A
Check headlamp system. Refer to EXL-55, "Work Flow" (XENON TYPE) or EXL-156, "Work FIGEN TYPE).	<u>Flow"</u> (HALO-
>> INSPECTION END	
4.CHECK HEATER FAN CONTROL SYSTEM	С
Check heater fan control system. Refer to <u>VTL-6. "VENTILATION SYSTEM (FRONT AIR CONI</u> System Description".	
>> INSPECTION END	D
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ELECTRONIC CONTROLLED ENGINE MOUNT

< DTC/CIRCUIT DIAGNOSIS >

ELECTRONIC CONTROLLED ENGINE MOUNT

Component Function Check

1.CHECK OVERALL FUNCTION

- 1. Start engine and warm it up to normal operating temperature.
- 2. Shift selector position is D while depressing the brake pedal and parking brake pedal.
- 3. Disconnect electronic controlled engine mount control solenoid valve harness connector.
- 4. Check that body vibration increases compared to the condition of step 2 above (with vehicle stopped).

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> EC-476, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:000000012406649

1.CHECK VACUUM SOURCE

- 1. Turn ignition switch OFF.
- 2. Reconnect electronic controlled engine mount control solenoid valve harness connector.
- 3. Disconnect vacuum hose connected to electronic controlled engine mount.
- 4. Start engine and let it idle.
- 5. Check vacuum hose for vacuum existence.

Vacuum should exist.

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 2.

2. CHECK VACUUM HOSES AND VACUUM GALLERY

- 1. Turn ignition switch OFF.
- Check vacuum hoses and vacuum gallery for clogging, cracks or improper connection. Refer to <u>EC-48</u>, <u>"ELECTRONIC CONTROLLED ENGINE MOUNT : System Description"</u>.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace vacuum hoses and vacuum gallery.

 $\mathbf{3}$. CHECK ELECTRONIC CONTROLLED ENGINE MOUNT CONTROL SOLENOID VALVE POWER SUPPLY

- 1. Disconnect electronic controlled engine mount control solenoid valve harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between front electronic controlled engine mount harness connector and ground.

	lled engine mount enoid valve	Ground	Voltage	
Connector	Terminal			
F11	1	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4.CHECK ELECTRONIC CONTROLLED ENGINE MOUNT CONTROL SOLENOID VALVE POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.

- 2. Disconnect fuse block (J/B) harness connector.
- 3. Check the continuity between electronic controlled engine mount harness connector and fuse block (J/B) harness connector.

[VQ35DE]

ELECTRONIC CONTROLLED ENGINE MOUNT

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

	ntrolled engine solenoid valve	Fuse bl	ock (J/B)	Continuity		A
Connector	Terminal	Connector	Terminal			EC
F11	1	E100	4F	Existed		EC
Is the inspecti						
_NO >> R	epair or repla	ouble diagnosis	ted parts.			С
5. CHECK EI NAL CIRCUIT			D ENGINE M	IOUNT CONTR	OL SOLENOID VALVE OUTPUT SIG-	D
		ess connector.				
	e continuity t valve harness		narness con	nector and elec	tronic controlled engine mount control	Е
		1		1		
EC	СМ	Electronic con mount control		Continuity		_
Connector	Terminal	Connector	Terminal	Continuity		F
F14	49	F11	2	Existed		
3. Also chec	k harness for	short to grour	nd and short t	o power.		G
Is the inspecti		<u>mal?</u>				
	iO TO 6. Ienair open ci	rcuit short to c	around or sho	ort to power in h	arness connectors.	Н
•	• •	-		•	DL SOLENOID VALVE	
					r to EC-477, "Component Inspection".	I
Is the inspecti		-			<u> </u>	
	O TO 7.					
	eplace electr	onic controlled	d engine mol	unt control solei	noid valve. Refer to EM-29, "Exploded	J
7.CHECK EL	ECTRONIC	CONTROLLEI		OUNT		
	ion switch OF					Κ
2. Install va (1).	cuum pump ((A) to electron	ic controlled	engine mount		
	at a vacuum	is maintained	when applyin	g the vacuum		L
	a (-0.41 kg/cm	n ² , -5.8 psi) to	electronic cor	ntrolled engine		
mount. 4. Also visua	ally check ele	ctronic control	led engine mo	ount.		Μ
Is the inspecti	-		<u> </u>			
	O TO 8.					
NO >> R	eplace electro	onic controlled	engine mour	nt.		Ν
8.CHECK IN				l	MBIB1237E	
		. Refer to <u>GI-4</u>	1 "Intermitter	nt Incident"		0
Is the inspecti						
		e manifold colle ice error-detec		<u>EM-29, "Exploa</u>	ded View".	Ρ
Componen	t Inspectio	n			INFOID:000000012406650	
1 .CHECK EL	ECTRONIC	CONTROLLEI		OUNT CONTRO	DL SOLENOID VALVE	
With CON 1. Turn ignit	SULT ion switch OF	F.				

Revision: October 2015

ELECTRONIC CONTROLLED ENGINE MOUNT

< DTC/CIRCUIT DIAGNOSIS >

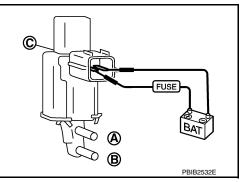
- 2. Reconnect electronic controlled engine mount control solenoid valve harness connector.
- 3. Disconnect vacuum hoses connected to electronic controlled engine mount control solenoid valve.
- 4. Turn ignition switch ON.
- 5. Select "ENGINE MOUNTING" in "ACTIVE TEST" mode with CONSULT.
- Check air passage continuity and operation delay time under the following conditions.

Condition (ENGINE MOUNTING)	Air passage continuity between (A) and (B)	Air passage continuity between (A) and (C)
TRVL	Existed	Not existed
IDLE	Not existed	Existed

Without CONSULT

- 1. Turn ignition switch OFF.
- 2. Disconnect electronic controlled engine mount control solenoid valve harness connector.
- 3. Disconnect vacuum hoses connected to electronic controlled engine mount control solenoid valve.
- 4. Check air passage continuity and operation delay time under the following conditions.

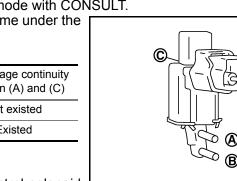
Condition	Air passage continuity between (A) and (B)	Air passage continuity between (A) and (C)
12 V direct current supply be- tween terminals 1 and 2	Existed	Not existed
No supply	Not existed	Existed



Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace electronic controlled engine mount control solenoid valve. Refer to <u>EM-29</u>, "<u>Exploded View</u>".



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FUEL INJECTOR

Component Function Check

1.INSPECTION START

Turn ignition switch to START.

Are any cylinders ignited?

YES >> GO TO 2.

NO >> Proceed to EC-479, "Diagnosis Procedure".

2.CHECK FUEL INJECTOR FUNCTION

With CONSULT

- 1. Start engine.
- 2. Perform "POWER BALANCE" in "ACTIVE TEST" mode with CONSULT.
- 3. Check that each circuit produces a momentary engine speed drop.

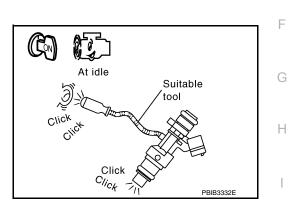
Without CONSULT

- 1. Start engine.
- 2. Listen to each fuel injector operating sound.

Clicking sound should be heard.

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Proceed to EC-479, "Diagnosis Procedure".



Diagnosis Procedure

INFOID:0000000012406652

1. CHECK FUEL INJECTOR POWER SUPPLY

- 1. Turn ignition switch OFF.
- 2. Disconnect fuel injector harness connector.
- 3. Turn ignition switch ON.
- 4. Check the voltage between fuel injector harness connector and ground.

Fuel injector		Oraciand Mathema				
Cylinder	Connector	Terminal	Ground	Voltage		
1	F37	1				
2	F38	1	-			
3	F39	1	Cround	Cround	Ground	Battery voltage
4	F40	1	Ground	Ballery vollage		
5	F41	1				
6	F42	1	-			

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.CHECK FUEL INJECTOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.

2. Disconnect IPDM E/R harness connector.

3. Check the continuity between fuel injector harness connector and IPDM E/R harness connector.

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FUEL INJECTOR

< DTC/CIRCUIT DIAGNOSIS >

	Fuel injector			IPDM E/R	
Cylinder	Connector	Terminal	Connector	Terminal	Continuity
1	F37	1	F12	51	
2	F38	1		52	-
3	F39	1		51	Existed
4	F40	1		52	Existed
5	F41	1		51	-
6	F42	1	+	52	

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit.

NO >> Repair or replace error-detected parts.

${f 3}.$ CHECK FUEL INJECTOR OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Check the continuity between fuel injector harness connector and ECM harness connector.

Continuity	M	EC	Fuel injector		
Continuity	Terminal	Connector	Terminal	Connector	Cylinder
	17	F14	2	F37	1
1	16		2	F38	2
Existed	22		2	F39	3
Existed	12		2	F40	4
1	11		2	F41	5
†	21		2	F42	6

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

Is the inspection result normal?

YES >> GO TO 4.

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

4.CHECK FUEL INJECTOR

Check fuel injector. Refer to EC-480, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace malfunctioning fuel injector. Refer to EM-49, "Exploded View".

5.CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

- YES >> Replace IPDM E/R. Refer to <u>PCS-34, "Exploded View"</u>.
- NO >> Repair or replace error-detected parts.

Component Inspection

1.CHECK FUEL INJECTOR

1. Turn ignition switch OFF.

2. Disconnect fuel injector harness connector.

FUEL INJECTOR

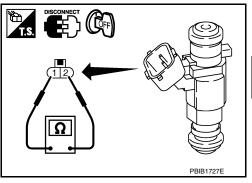
< DTC/CIRCUIT DIAGNOSIS >

3. Check resistance between fuel injector terminals as per the following.

Terminals	Resistance				
1 and 2	11.1 - 14.5 Ω [at 10 - 60°C (50 - 140°F)]				

Is the inspection result normal? YES >> INSPECTION END

YES >> INSPECTION END NO >> Replace malfunctioning fuel injector. Refer to <u>EM-49</u>, <u>"Exploded View"</u>.



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< DTC/CIRCUIT DIAGNOSIS >

FUEL PUMP

Component Function Check

1.CHECK FUEL PUMP FUNCTION

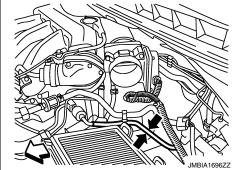
- 1. Turn ignition switch ON.
- 2. Pinch fuel feed hose (\Leftarrow) with two fingers.

Fuel pressure pulsation should be felt on the fuel feed hose for 1 second after ignition switch is turned ON.

Is the inspection result normal?

YES >> INSPECTION END

NO >> EC-482, "Diagnosis Procedure".



INFOID:000000012406655

Diagnosis Procedure

1.CHECK FUEL PUMP RELAY POWER SUPPLY-I

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Turn ignition switch ON.
- 4. Check the voltage between ECM harness connector terminals.

	+		_		
Connector	Terminal	Connector	Terminal	*	
F14	19	E19	152	Battery voltage	

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 2.

2.CHECK FUEL PUMP RELAY POWER SUPPLY-II

Check the voltage between IPDM E/R harness connector and ground.

IPDM E/R		Ground	Voltage
Connector	Terminal	Ground	voltage
F12	77	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 7.

3. CHECK FUEL PUMP RELAY POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.

2. Disconnect IPDM E/R harness connector.

3. Check the continuity between ECM harness connector and IPDM E/R harness connector.

ECM		IPDM E/R		Continuity
Connector	Terminal	Connector Terminal		Continuity
F14	19	F12	77	Existed

FUEL PUMP

< DTC/CIRCU	IIT DIAGNO	SIS >			[VQ35DE]
s the inspection YES >> Pe			is for power su	only circuit	
		ice error-dete		ppiy circuit.	
1. CHECK FU	EL PUMP P	OWER SUPP	LY CIRCUIT		
				arness connecto	
	rness contin ness connec		IPDM E/R ha	rness connecto	r and "fuel level sensor unit and fuel
Peb					
IPDM	E/R		sor unit and fuel		
Connector	Terminal	Connector	Imp Terminal	Continuity	
E10	13	B40	1	Existed	
s the inspectio	on result norr	nal?			
YES >> G(O TO 5.				
-	• •		•	ness or connect	ors.
CHECK FU	EL PUMP G	ROUND CIRC	CUIT		
				arness connector t and fuel pump	or. " harness connector and ground.
				- F F	
Fuel level sense				_	
pun	•	Ground	Continuity		
Connector	Terminal	Orrest	F , 1-1-3	_	
B40	3	Ground	Existed	_	
<u>s the inspection</u> YES >> G	on result norr O TO 6.	<u>nal (</u>			
		rcuit or short t	to power in har	ness or connect	ors.
CHECK FU					
heck fuel pur	np. Refer to	EC-483. "Cor	nponent Inspec	tion (Fuel Pump)".
s the inspection	•				<u></u>
	O TO 7.				
	•	•	ump assembly	Refer to <u>FL-6, '</u>	'Removal and Installation".
CHECK IN	FERMITTEN	TINCIDENT			
			11, "Intermitten	t Incident".	
s the inspection			DOO 0 ()		
		E/R. Refer to ce error-dete		noval and Install	ation".
			•		
Jomponent	i inspectio	n (Fuel Pu	iiiip)		INFOID:000000012406656
.CHECK FU	EL PUMP				
. Turn ignitio	on switch OF	F.			
. Disconnec	t "fuel level s	sensor unit (fu		ess connector.	
. Check res	istance betw	een "tuel leve	ei sensor unit (f	uel pump)" term	inais as tollows.
Terminals	Resistance I	at 25°C (77°F)]	_		
1 and 3		- 5.0 Ω			
	0.2 -	0.0 32			

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace fuel level sensor unit, fuel filter and fuel pump assembly. Refer to <u>FL-6</u>, "Exploded View".

< DTC/CIRCUIT DIAGNOSIS >

IGNITION SIGNAL

Component Function Check

INFOID:000000012406657

[VQ35DE]

1.INSPECTION START

Turn ignition switch OFF, and restart engine.

Does the engine start?

YES-1 >> With CONSULT: GO TO 2.

YES-2 >> Without CONSULT: GO TO 3.

NO >> Proceed to <u>EC-484</u>, "Diagnosis Procedure".

2. CHECK IGNITION SIGNAL FUNCTION

With CONSULT

- 1. Perform "POWER BALANCE" in "ACTIVE TEST" mode with CONSULT.
- 2. Check that each circuit produces a momentary engine speed drop.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to EC-484, "Diagnosis Procedure".

3.CHECK IGNITION SIGNAL FUNCTION

Without CONSULT

1. Let engine idle.

2. Read the voltage signal between ECM harness connector terminals with an oscilloscope.

ECM				
	+ –		Voltage signal	
Connector	Terminal	Connector	Terminal	
-	103			
	104			50mSec/div
F 4 F	106	F 40	450	
F15	107	E19	152	÷
	113			
114	114			2V/div JMBIA0035GB
NOTE	114			2V/div JMBIA0035GB

NOTE:

The pulse cycle changes depending on rpm at idle.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to EC-484, "Diagnosis Procedure".

Diagnosis Procedure

1.CHECK ECM POWER SUPPLY

- 1. Turn ignition switch OFF, wait at least 10 seconds and then turn it ON.
- 2. Check the voltage between ECM harness connector terminals.

Connector	+	-	Voltage
Connector	Terminal	Terminal	
E19	145	152	Battery voltage

Is the inspection result normal?

YES >> GO TO 2.

NO >> Refer to EC-175, "Diagnosis Procedure".

		IG	UNITION 3	IGNAL	
< DTC/CIRCU	IT DIAGNOSI	S >		[να	35DE]
2.снеск со	NDENSER PC	WER SUPPLY			
1. Turn ignitio	on switch OFF.				
		arness connecto	or.		-
•	on switch ON.				
4. Check the	voltage betwee	en condenser ha	arness conne	ctor and ground.	Ľ
Cond	denser	Ground	Voltage		
Connector	Terminal				
F13	1	Ground	Battery voltag	ge	
s the inspection	on result norma	<u> ?</u>			
	O TO 4.				
•	D TO 3.				
3. CHECK CO	NDENSER PC	WER SUPPLY	CIRCUIT		
1. Turn ignitio	on switch OFF.				
2. Disconnec	t IPDM E/R ha	rness connecto			
3. Check the	continuity betw	veen IPDM E/R	harness conr	nector and condenser harness connector.	
IPDN	/I E/R	Conde	nser	Continuity	
Connector	Terminal	Connector	Terminal		
F12	49	F13	1	Existed	
	on result norma	nort to ground a <u>I?</u>			
		"Diagnosis Pro	cedure"		
				power in harness or connectors.	
4. снеск со	NDENSER GF			NAND SHORT	
	on switch OFF.				
•		veen condenser	harness con	nector and ground.	
	5			5	
Cond	denser				
Connector	Terminal	Ground	Continuity		
F13	2	Ground	Existed		
	harness for sl		Exiotod		
	on result norma	-			
	D TO 5.	<u>II :</u>			
		uit or short to po	wer in harnes	ss or connectors.	
D.CHECK CO					
			nent Inspectio	on (Condenser)"	
•	on result norma	<u> ?</u>			
	D TO 6.				
^	eplace condens				
J. CHECK IGN	NITION COIL F	OWER SUPPL	Y		
		nnectors discor			
		arness connecto	or.		
3. Turn ignitio	on switch ON.				

Check the voltage between ignition coil harness connector and ground.

< DTC/CIRCUIT DIAGNOSIS >

	Ignition coil			Voltage
Cylinder	Connector	Terminal	Ground	voltage
1	F31	3		
2	F32	3		
3	F33	3	Ground	Battery voltage
4	F34	3	Giouna	Ballery vollage
5	F35	3		
6	F36	3		

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace harness or connectors.

7. CHECK IGNITION COIL GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.

2. Check the continuity between ignition coil harness connector and ground.

	Ignition coil		Ground	Continuity
Cylinder	Connector	Terminal	Ground	Continuity
1	F31	2		
2	F32	2	-	
3	F33	2	Ground	Existed
4	F34	2	Ground	LAISted
5	F35	2	-	
6	F36	2	-	

3. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 8.

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

 $\mathbf{8}$. CHECK IGNITION COIL OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Disconnect ECM harness connector.

2. Check the continuity between ignition coil harness connector and ECM harness connector.

	Ignition coil		ECM		Continuity
Cylinder	Connector	Terminal	Connector	Terminal	Continuity
1	F31	1		113	
2	F32	1		106	
3	F33	1	F15	103	Existed
4	F34	1	FIJ	114	Existed
5	F35	1		107	
6	F36	1		104	

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

Is the inspection result normal?

YES >> GO TO 9.

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

9. CHECK IGNITION COIL WITH POWER TRANSISTOR

Check ignition coil with power transistor. Refer to <u>EC-487</u>, "Component Inspection (Ignition Coil with Power Transistor)".

	IGNITION SIGNAL	
< DTC/CIRCUIT DIAGNOS	IS >	[VQ35DE]
Is the inspection result norma	al?	
	nt incident. Refer to <u>GI-41, "Intermittent Ir</u>	
NO >> Replace malfunc	tioning ignition coil with power transistor.	Refer to EM-54, "Exploded View".
Component Inspection	(Ignition Coil with Power Transi	stor) INFOID:000000012406659 EC
1. CHECK IGNITION COIL	WITH POWER TRANSISTOR-I	
1. Turn ignition switch OFF.		С
 Disconnect ignition coil h Check resistance between 	narness connector. En ignition coil terminals as per the follow	ing
o. Oncorresistance betwee		
Terminal No. (Polarity)	Resistance Ω [at 25°C (77°F)]	D
1 and 2	Except 0 or ∞	
1 and 3		Е
2 and 3	Except 0	
Is the inspection result norma	al?	
YES >> GO TO 2.	_	F
	tioning ignition coil with power transistor.	Refer to EM-54, "Exploded View".
2.CHECK IGNITION COIL	WITH POWER TRANSISTOR-II	G
CAUTION:		
	edure in a place with no combustible o	objects and good ventilation.
 Turn ignition switch OFF. Reconnect all harness compared and the second se		Н
3. Remove fuel pump fuse	in IPDM E/R to release fuel pressure.	
NOTE:	release fuel pressure, or fuel pressure a	poplice again during the following proce
dure.	o release fuel pressure, or fuel pressure a	ipplies again during the following proce-
4. Start engine.		
 After engine stalls, crank Turn ignition switch OFF. 	t it 2 or 3 times to release all fuel pressure	e. J
	narness connectors to avoid the electrical	discharge from the ignition coils.
8. Remove ignition coil and	spark plug of the cylinder to be checked.	
	nds or more to remove combustion gas in harness connector to ignition coil.	the cylinder. K
11. Fix ignition coil using a r	ope etc. with gap of 13 - 17 mm (0.52 -	
	e of the spark plug and grounded metal	L
portion as shown in the f	igure. cimately 3 seconds, and check whether	
	veen the spark plug and the grounded	H.
metal portion.		M
Spark should be ger	nerated.	13 - 17 mm
CAUTION:		رور (0.52-0.66 in) N
	, always stay 0.5 m (19.7 in) or more	Grounded metal portion ` (Cylinder head, cylinder block, etc.)
	plug and the ignition coil. Be careful	JMBIA0066GB
	al shock while checking, because the voltage becomes 20 kV or more.	0
 It might cause to dam 	hage the ignition coil if the gap of more	e than 17 mm (0.66 in) is taken.
NOTE: When the gap is less t	han 13 mm (0 52 in) the anark might	be generated over if the sail is mal
functioning.	han 13 mm (0.52 in), the spark might	De generateu even îl the con is mai-
	-10	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace malfunctioning ignition coil with power transistor. Refer to EM-54, "Exploded View".

< DTC/CIRCUIT DIAGNOSIS >

Component Inspection (Condenser)

INFOID:000000012406660

[VQ35DE]

1.CHECK CONDENSER

- 1. Turn ignition switch OFF.
- 2. Disconnect condenser harness connector.
- 3. Check resistance between condenser terminals as per the following.

Terminals	Resistance
1 and 2	Above 1 M Ω [at 25C $^{\circ}$ (77C $^{\circ}$)]

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace condenser.

INFORMATION DISPLAY (ASCD)

< DTC/CIRCUIT DIAGNOSIS > [VQ35DE]	
INFORMATION DISPLAY (ASCD)	_
Component Function Check	A
1. CHECK INFORMATION DISPLAY	EC
 Start engine. Press MAIN switch on ASCD steering switch. Drive the vehicle at more than 40 km/h (25 MPH). CAUTION: 	С
 Always drive vehicle at a safe speed. Press SET/COAST switch. Check that the reading of the speedometer shows the same value as the set speed indicated in the information display while driving the vehicle on a flat road. 	D
Is the inspection result normal? YES >> INSPECTION END NO >> Proceed to <u>EC-489, "Diagnosis Procedure"</u> .	E
Diagnosis Procedure	²² F
1.снеск отс	
Check that DTC UXXXX, P0500 or P1574 is not displayed.	G
Is the inspection result normal? YES >> GO TO 2. NO-1 >> Perform trouble diagnosis for DTC UXXXX. NO-2 >> Perform trouble diagnosis for DTC P0500. Refer to EC-351, "DTC Logic". NO-3 >> Perform trouble diagnosis for DTC P1574. Refer to EC-419, "DTC Logic".	Н
2. CHECK DTC WITH COMBINATION METER	
Check combination meter function. Refer to MWI-36, "CONSULT Function". Is the inspection result normal? YES >> GO TO 3. NO >> Perform trouble diagnosis for DTC indicated.	J
3. CHECK INTERMITTENT INCIDENT	K
Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u> . <u>Is the inspection result normal?</u> YES >> Replace combination meter. Refer to <u>MWI-96, "Removal and Installation"</u> . NO >> Repair or replace.	L
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[VQ35DE]

MALFUNCTION INDICATOR LAMP

Component Function Check

1.CHECK MIL FUNCTION

1. Turn ignition switch ON.

2. Check that MIL illuminates.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to EC-490, "Diagnosis Procedure".

Diagnosis Procedure

1. СНЕСК DTC

Check that DTC UXXXX is not displayed.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Perform trouble diagnosis for DTC UXXXX.

2. CHECK COMBINATION METER FUNCTION

Check combination meter function. Refer to MWI-36. "CONSULT Function".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace.

3.CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace combination meter. Refer to <u>MWI-96, "Exploded View"</u>.

NO >> Repair or replace error-detected parts.

INFOID:000000012406663

ON BOARD REFUELING VAPOR RECOVERY (ORVR) **IVQ35DE1** < DTC/CIRCUIT DIAGNOSIS > ON BOARD REFUELING VAPOR RECOVERY (ORVR) **Component Function Check** INFOID:000000012406665 1. CHECK ORVR FUNCTION EC Check whether the following symptoms are present. • Fuel odor from EVAP canister is strong. Cannot refuel/Fuel odor from the fuel filler opening is strong while refueling. Are any symptoms present? YES >> Proceed to EC-491, "Diagnosis Procedure". >> INSPECTION END NO Diagnosis Procedure INEOID:000000012406666 **1**.INSPECTION START

Check whether the following symptoms are present.

A: Fuel odor from EVAP canister is strong.

B: Cannot refuel/Fuel odor from the fuel filler opening is strong while refueling.

A or B

- А >> GO TO 2.
- В >> GO TO 7.

2. CHECK EVAP CANISTER

- Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor Н 1. attached. Refer to FL-17, "Exploded View".
- Weigh the EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.

The weight should be less than 2.1 kg (4.6 lb).

Is the inspection result normal?

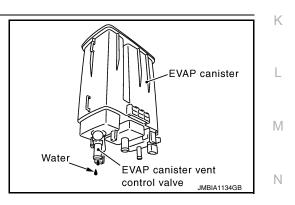
YES >> GO TO 3. NO >> GO TO 4.

3.CHECK IF EVAP CANISTER IS SATURATED WITH WATER

Check if water will drain from EVAP canister

Does water drain from the EVAP canister?

YES >> GO TO 4. >> GO TO 6. NO



4.REPLACE EVAP CANISTER

Replace EVAP canister with a new one. Refer to FL-17, "Exploded View".

>> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the EVAP hose between EVAP canister and vehicle frame for clogging or poor connection.

>> Repair or replace EVAP hose. Refer to EM-29, "Exploded View".

 $\mathfrak{b}.$ CHECK REFUELING EVAP VAPOR CUT VALVE

Check refueling EVAP vapor cut valve. Refer to EC-493, "Component Inspection".

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ON BOARD REFUELING VAPOR RECOVERY (ORVR)

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

<u>Is the inspection result normal?</u> YES >> INSPECTION END

NO >> Replace refueling EVAP vapor cut valve with fuel tank. Refer to <u>FL-13, "Exploded View"</u>.

7. CHECK EVAP CANISTER

- Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached. Refer to <u>FL-17</u>, "<u>Exploded View</u>".
- 2. Weigh the EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.

The weight should be less than 2.1 kg (4.6 lb).

Is the inspection result normal?

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

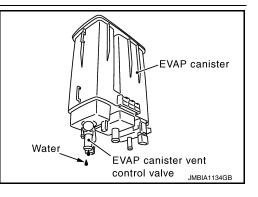
8.CHECK IF EVAP CANISTER IS SATURATED WITH WATER

Check if water will drain from EVAP canister.

Does water drain from the EVAP canister?

YES >> GO TO 6.

NO >> GO TO 11.



9.REPLACE EVAP CANISTER

Replace EVAP canister with a new one. Refer to <u>FL-17, "Exploded View"</u>.

>> GO TO 10.

10. DETECT MALFUNCTIONING PART

Check the EVAP hose between EVAP canister and vehicle frame for clogging or poor connection.

>> Repair or replace EVAP hose. Refer to EM-29, "Exploded View".

11.CHECK VENT HOSES AND VENT TUBES

Check hoses and tubes between EVAP canister and refueling control valve for clogging, kinks, looseness and improper connection.

Is the inspection result normal?

YES >> GO TO 12.

NO >> Repair or replace hoses and tubes.

12.CHECK FILLER NECK TUBE

Check recirculation line for clogging, dents and cracks.

Is the inspection result normal?

YES >> GO TO 13.

NO >> Replace filler neck tube.

13. CHECK REFUELING EVAP VAPOR CUT VALVE

Check refueling EVAP vapor cut valve. Refer to EC-493, "Component Inspection".

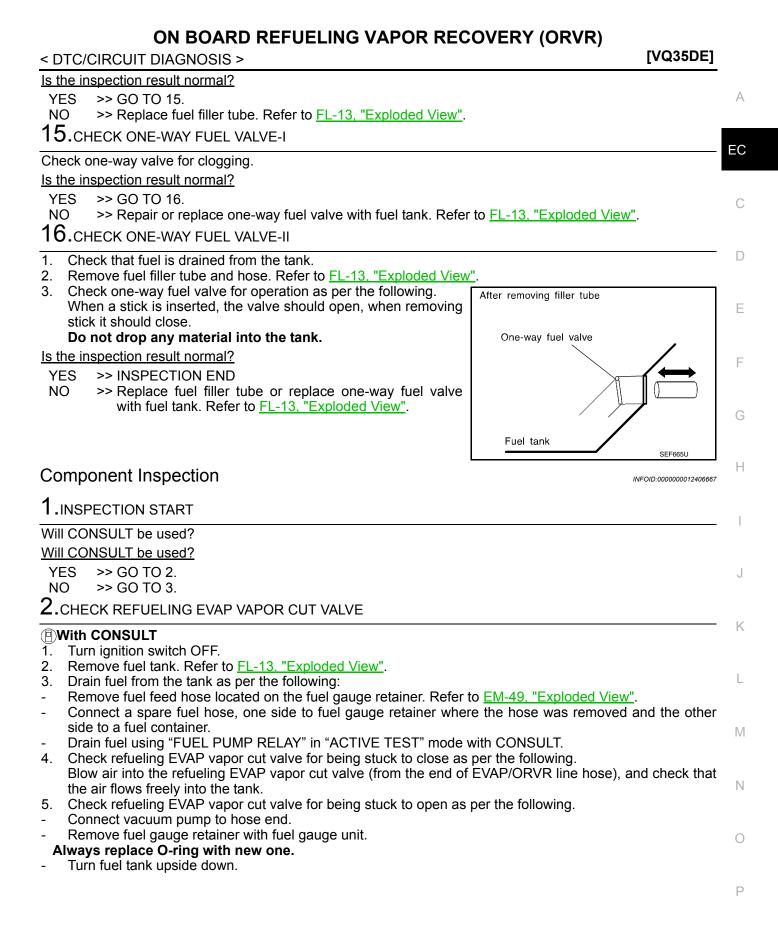
Is the inspection result normal?

YES >> GO TO 14.

NO >> Replace refueling EVAP vapor cut valve with fuel tank. Refer to <u>FL-13. "Exploded View"</u>.

14.CHECK FUEL FILLER TUBE

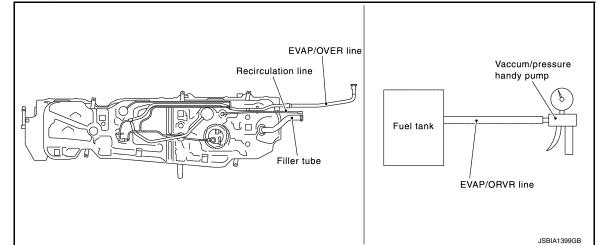
Check filler neck tube and hose connected to the fuel tank for clogging, dents and cracks.



ON BOARD REFUELING VAPOR RECOVERY (ORVR)

< DTC/CIRCUIT DIAGNOSIS >

- Apply vacuum pressure to hose end [-13.3 kPa (-0.136 kg/cm², -1.93 psi)] with fuel gauge retainer remaining open and check that the pressure is applicable.



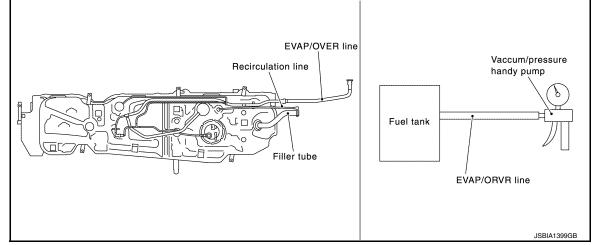
Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Replace refueling EVAP vapor cut valve with fuel tank. Refer to FL-13, "Exploded View".

3.CHECK REFUELING EVAP VAPOR CUT VALVE

Without CONSULT

- 1. Turn ignition switch OFF.
- 2. Remove fuel tank. Refer to FL-13, "Exploded View".
- 3. Drain fuel from the tank as per the following:
- Remove fuel gauge retainer.
- Drain fuel from the tank using a handy pump into a fuel container.
- 4. Check refueling EVAP vapor cut valve for being stuck to close as per the following. Blow air into the refueling EVAP vapor cut valve (from the end of EVAP/ORVR line hose), and check that the air flows freely into the tank.
- 5. Check refueling EVAP vapor cut valve for being stuck to open as per the following.
- Connect vacuum pump to hose end.
- Remove fuel gauge retainer with fuel gauge unit.
- Always replace O-ring with new one.
- Turn fuel tank upside down.
- Apply vacuum pressure to hose end [-13.3 kPa (-0.136 kg/cm², -1.93 psi)] with fuel gauge retainer remaining open and check that the pressure is applicable.



Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace refueling EVAP vapor cut valve with fuel tank. Refer to <u>FL-13</u>, "Exploded View".

IVQ35DE1

DTC/CIRCU						[VQ35DE]
KEFKIGE	KANT PR	ESSURE SEI	NSOR	K		
Component	Function (Check				INFOID:000000012406668
1 .CHECK REI	FRIGERANT	PRESSURE SENS	OR FUN	ICTION		
2. Turn A/Č s	witch and blo	t up to normal opera wer fan switch ON. een ECM harness c	-	-	s. Is under the following	I
		ECM				
Connector		+		-	Voltage (V)	
Connector	T	erminal	Terr	ninal		
F14	(Refrigerant pr	20 essure sensor signal)		25 ground)	1.0 - 4.0	
the inspectio		,	(5		
YES >> INS	SPECTION E		cedure".			
iagnosis P	rocedure					INFOID:000000012406669
		PRESSURE SENS			ע וסכ	
. Check the	-	een refrigerant pres	sure ser	isor harn	ess connector and gro	und.
Connector	pressure sensor	Ground	Volta	age (V)		
E300	Terminal 1	Ground	Anr	prox. 5	-	
s the inspectio			7.61	NOX. 0		
YES >> GC NO >> GC	D TO 3. D TO 2.	PRESSURE SENS		VER SUI	PPLY CIRCUIT	
Turn ignitic Disconnect	on switch OFF t ECM harnes	s connector.				ECM harness connec-
Refrigerant pres	ssure sensor	ECM		Cont	inuity	
Connector	Terminal		minal			
E300	1		18	Exi	sted	
NO >> Re	rform the trou pair or replac	ble diagnosis for po e error-detected pa	rts.			
			UR GR(JUND CI	RCUIT FOR OPEN A	
2. Disconnect	on switch OFF t ECM harnes continuity bet	s connector.	ressure	sensor h	arness connector and	ECM harness connec-

REFRIGERANT PRESSURE SENSOR

REFRIGERANT PRESSURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

Refrigerant pr	essure sensor	E	Continuity				
Connector	Terminal	Connector	Terminal	Continuity			
E300	3	F14	25	Existed			

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

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK REFRIGERANT PRESSURE SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between refrigerant pressure sensor harness connector and ECM harness connector.

Refrigerant pr	ressure sensor	E	Continuity			
Connector	Terminal	Connector	Terminal	Continuity		
E300	2	F14	20	Existed		

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

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace refrigerant pressure sensor. Refer to <u>HA-43</u>, "Exploded View".

NO >> Repair or replace error-detected parts.

< DTC/CIRCUIT DIAGNOSIS >

SENSOR POWER SUPPLY2 CIRCUIT

Description

ECM supplies a voltage of 5 V to some of the sensors systematically divided into 2 groups, respectively. Accordingly, when a short circuit develops in a sensor power source, a malfunction may occur simultaneously in the sensors belonging to the same group as the short-circuited sensor.

Sensor power supply 1

- Accelerator pedal position (APP) sensor 1
- Crankshaft position (CKP) sensor (POS)
- Exhaust valve timing (EVT) control position sensor
- · Mass air flow (MAF) sensor
- Throttle position (TP) sensor

NOTE:

If sensor power supply 1 circuit is malfunctioning, DTC P0643 is displayed.

Sensor power supply 2

- Accelerator pedal position (APP) sensor 2
- Battery current sensor
- Camshaft position (CMP) sensor (PHASE)
- Engine oil pressure (EOP) sensor
- Refrigerant pressure sensor

Diagnosis Procedure

1.CHECK SENSOR POWER SUPPLY 1

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connectors
- 3. Turn ignition switch ON.
- 4. Check the voltage between ECM harness connector and ground.

-	+					
EC	E19 142		Voltage (Approx.)			
Connector	Terminal		(, ,pp. c)			
E19	142					
F14	18	Ground	5 V			
F15	87	Ground	3 V			
115	92					

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".

NO >> GO TO 2.

2. CHECK SENSOR POWER SUPPLY 2 CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect following sensors harness connector.
- 3. Check harness for short to power and short to ground, between the following terminals.

	E	СМ	Sensor	Sensor										
_	Connector	Terminal	Name	Connector	Terminal									
_	E19	142	APP sensor 2	E110	5									
	F14	18	Refrigerant pressure sensor	E300	1									
_	Г 14	10	EOP sensor	F67	3									

EC-497

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SENSOR POWER SUPPLY2 CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

E	CM	Sensor										
Connector	Terminal	Name	Connector	Terminal								
	87	Battery current sensor	F76	1								
F15	92	CMP sensor (PHASE) (bank 1)	F45	1								
	52	CMP sensor (PHASE) (bank 2)	F46	1								

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3. CHECK COMPONENTS

Check the following.

- Accelerator pedal position (APP) sensor 2 (Refer to EC-454, "Component Inspection".)
- Battery current sensor (Refer to EC-397, "Component Inspection".)
- Camshaft position sensor (PHASE) (bank 1) (Refer to EC-303, "Component Inspection".)
- Camshaft position sensor (PHASE) (bank 2) (Refer to EC-303, "Component Inspection".)
- Engine oil pressure (EOP) sensor (Refer to EC-361, "Component Inspection".)
- Refrigerant pressure sensor (Refer to EC-495, "Diagnosis Procedure".)

Is the inspection result normal?

- YES >> Perform GI-41, "Intermittent Incident".
- NO >> Replace malfunctioning component.

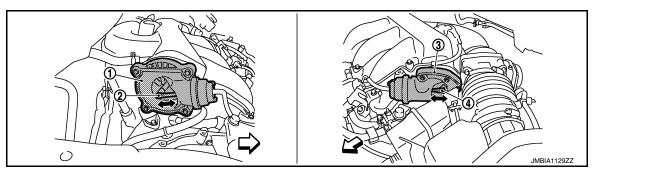
< DTC/CIRCUIT DIAGNOSIS >

VARIABLE INDUCTION AIR SYSTEM

Component Function Check

1. CHECK OVERALL FUNCTION-I

- 1. Start engine and warm it up to the normal operating temperature.
- 2. Perform "VIAS S/V-1" in "ACTIVE TEST" mode with CONSULT.
- Turn VIAS control solenoid valve 1 "ON" and "OFF", and check that power valve actuator 1 rod moves. 3.

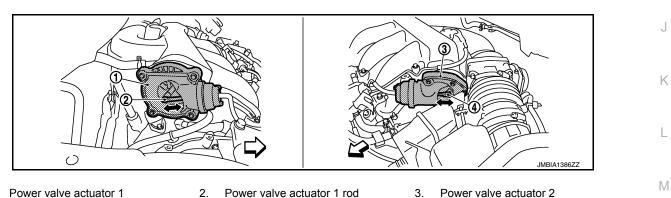


- 1. Power valve actuator 1
- 2. Power valve actuator 1 rod
- 3.
- Power valve actuator 2

- Power valve actuator 2 rod 4
- : Vehicle front

Without CONSULT

- Start engine and warm it up to the normal operating temperature. 1
- 2. Rev engine guickly up to approximately 5,000 rpm.
- 3. Check that power valve actuator 1 rod moves.



- 1 Power valve actuator 1
 - Power valve actuator 2 rod 4
 - : Vehicle front

Is the inspection result normal?

YES >> GO TO 2.

- >> EC-500, "Diagnosis Procedure". NO
- 2.CHECK OVERALL FUNCTION-II

(P) With CONSULT

- 1. Perform "VIAS S/V-2" in "ACTIVE TEST" mode with CONSULT.
- Turn VIAS control solenoid valve 2 "ON" and "OFF", and check that power valve actuator 2 rod moves. 2.

EC-499



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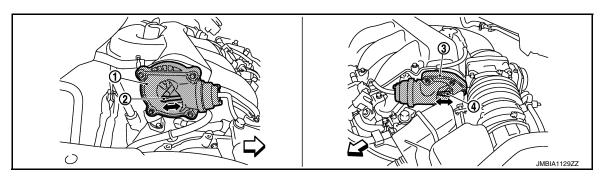
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< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]



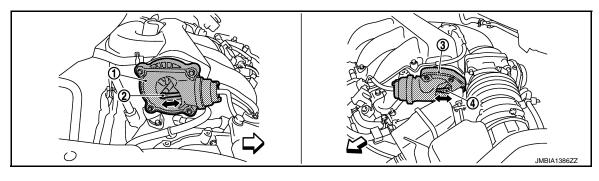
- 1. Power valve actuator 1
- 2. Power valve actuator 1 rod
- 3. Power valve actuator 2

Power valve actuator 2

- 4. Power valve actuator 2 rod
- ∠ : Vehicle front

Without CONSULT

- 1. When revving engine up to 5,000 rpm quickly.
- 2. Rev engine quickly up to approximately 5,000 rpm.
- 3. Check that power valve actuator 2 rod moves.



Power valve actuator 1 rod

3.

- 1. Power valve actuator 1
- 4. Power valve actuator 2 rod
- \triangleleft : Vehicle front

Is the inspection result normal?

YES >> INSPECTION END

NO >> EC-500, "Diagnosis Procedure".

Diagnosis Procedure

1.INSPECTION START

Confirm the malfunctioning system (power valve 1 or power valve 2). Refer to <u>EC-499</u>, "Component Function <u>Check</u>".

Which system is related to the incident?

Power valve 1>>GO TO 2.

Power valve 2>>GO TO 6.

2.CHECK VACUUM EXISTENCE-I

With CONSULT

1. Stop engine and disconnect vacuum hose connected to power valve actuator 1.

2.

- 2. Start engine and let it idle.
- 3. Perform "VIAS S/V-1" in "ACTIVE TEST" mode with CONSULT.
- Turn VIAS control solenoid valve 1 ON and OFF, and check vacuum existence under the following conditions.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

[®] Without CONSULT ¹ Stop engine and disconnect vacuum hose connected to power valve actuator 1. ² Disconnect VIAS control solenoid valve 1 harness connector. ³ Start engine. ⁴ Rev engine quickly up to approximately 5,000 rpm. ⁵ Check vacuum existence under the following conditions. ¹ dile ¹ dile ¹ Rev engine quickly up to approximately 5,000 rpm. ¹ dile ¹ Rev engine quickly up to approximately 5,000 rpm. ¹ dile ¹ Rev engine quickly up to approximately 5,000 rpm. ¹ dile ¹ dile ¹ dile ¹ Step engine or replace power valve actuator 1. Refer to <u>EC-17. "ENGINE CONTROL SYSTEM.: Component Parts Location". NO >> GO TO 3. 3 CHECK VACUUM TANK 1. Stop engine and disconnect vacuum hose connected to intake manifold collector. 2. Start engine and let it idle. 3. Check vacuum existence from the intake manifold collector? <</u>					
OFF Not existed (R) Without CONSULT	VIAS S/V-1	Vacuum	_		А
⁽¹⁾ Without CONSULT ⁽²⁾ Stop engine and disconnect vacuum hose connected to power valve actuator 1. ⁽²⁾ Disconnect VIAS control solenoid valve 1 hamess connector. ⁽²⁾ Start engine. ⁽²⁾ Revengine quickly up to approximately 5,000 rpm. ⁽²⁾ Condition ⁽²⁾ Revengine quickly up to approximately 5,000 rpm. ⁽²⁾ Condition ⁽²⁾ Condition tesult normal? ⁽²⁾ Condition tesult normal? ⁽²⁾ YES ⁽²⁾ Revengine and disconnect vacuum hose connected to intake manifold collector. ⁽²⁾ Start engine and disconnect vacuum hose connected to intake manifold collector. ⁽²⁾ Start engine and leit lide. ⁽²⁾ Check vacuum existence from the intake manifold collector? ⁽²⁾ Start engine end disconnect vacuum hose connected to intake manifold collector. ⁽²⁾ Start engine. ⁽²⁾ Start engine engine. ⁽²⁾ Check vacuum hose for crack, clogging, improper connection or disconnection, Refer to EC-56, 'VARIABLE INDUCTION AIR SYSTEM : System Description'. ⁽²⁾ Start engine hoses or tubes. ⁽²⁾ Start engine and etil tormal? ⁽²⁾ Start engine engine.	ON	Existed	—		
Swithout CONSULT Stop engine and disconnect vacuum hose connected to power valve actuator 1. 2. Disconnect VIAS control solenoid valve 1 harness connector. C 3. Start engine. C 4. Rev engine quickly up to approximately 5,000 rpm. C 5. Check vacuum existence under the following conditions. D ¹ and the sequence of the following conditions. D ¹ and the sequence of the following conditions. D ¹ and the sequence of the following conditions. D ¹ and the sequence of the following conditions. D ¹ and the sequence of the following conditions. D ¹ and the sequence of the following conditions. D ¹ And the sequence of the intake manifold collector. D ¹ Os the sequence from the intake manifold collector? P ¹ Os the sequence from the intake manifold collector? P ¹ Os the sequence from the intake manifold collector? P ¹ Os the sequence from the intake manifold collector? P ¹ Os the sequence from the intake manifold collector? S ¹ Os the seque thoses or tu	OFF	Not existed			EC
Idle Existed Rev engine quickly up to approximately 5.000 rpm Not existed Is the inspection result normal? YES YES >> Repair or replace power valve actuator 1. Refer to EC-17, "ENGINE CONTROL SYSTEM : Component Parks Location". F NO >> GO TO 3. G 3. CHECK VACUUM TANK G 1. Stop engine and let it idle. H 3. Check vacuum existence from intake manifold collector. E Oes vacuum existence from intake manifold collector? YES YES >> GO TO 4. NO >> Replace intake manifold collector. Refer to EM-29, "Exploded View". 4. CHECK VACUUM HOSE I 1. Stop engine. J 2. Check vacuum hose for crack, clogging, improper connection or disconnection. Refer to EC-56, "VARIABLE INDUCTION AIR SYSTEM". System Description". Is the inspection result normal? YES YES >> GO TO 5. NO >> Replace to the EC-432. "Component Inspection". Is the inspection result normal? YES YES >> GO TO 5. NO >> Replace VIAS control solenoid valve 1. Refer to EC-432. "Component Inspection". Is the inspection result normal? YES <t< td=""><td> Stop engine and dis Disconnect VIAS co Start engine. Rev engine quickly </td><th>ontrol solenoid valve up to approximately</th><td>1 harness connector. 5,000 rpm.</td><td>Ilve actuator 1.</td><td>С</td></t<>	 Stop engine and dis Disconnect VIAS co Start engine. Rev engine quickly 	ontrol solenoid valve up to approximately	1 harness connector. 5,000 rpm.	Ilve actuator 1.	С
Idle Existed Rev engine quickly up to approximately 5.000 rpm Not existed Is the inspection result normal? YES YES >> Repair or replace power valve actuator 1. Refer to EC-17, "ENGINE CONTROL SYSTEM : Component Parts Location". F NO >> GO TO 3. G 1. Stop engine and disconnect vacuum hose connected to intake manifold collector. 2 2. Start engine and let it idle. H 3. CHECK VACUUM TANK G 4. Check vacuum existence from intake manifold collector. H Does vacuum existence from intake manifold collector? YES YES >> GO TO 4. H NO >> Replace intake manifold collector. Refer to EM-29. "Exploded View". I 4. CHECK VACUUM HOSE I System to mescription". 1. Stop engine. I I Stop engine. J 2. Check vacuum hose for crack, clogging, improper connection or disconnection result normal? J J YES >> GO TO 5. NO >> Repair hoses or tubes. M 5. CHECK VIAS CONTROL SOLENOID VALVE 1 Improper connection I Check VIAS control solenoid valve 1. Refer to EC-432. "Component Inspection". I	Condit	ion	Vasuum		D
Rev engine quickly up to approximately 5.000 rpm Not existed Is the inspection result normal? YES YES >> Repair or replace power valve actuator 1. Refer to EC-17, "ENGINE CONTROL SYSTEM : Component Park Location". NO >> GO TO 3. 3.CHECK VACUUM TANK G 1. Stop engine and disconnect vacuum hose connected to intake manifold collector. E 2. Start engine and let it idle. Check vacuum existence from intake manifold collector. 2. Start engine and let it idle. Check vacuum existence from intake manifold collector? YES >> GO TO 4. NO >> Replace intake manifold collector. Refer to EM-29, "Exploded View". 4.CHECK VACUUM HOSE Improper connection or disconnection. Refer to EC-56, "VARIABLE INDUCTION AIR SYSTEM: System Description". 1. Stop engine. J 2. Check vacuum hose for crack, clogging, improper connection or disconnection. Refer to EC-56, "VARIABLE INDUCTION AIR SYSTEM: System Description". Is the inspection result normal2 YES YES >> GO TO 5. NO >> Replace VIAS control Solenoid valve 1. Refer to EC-432. "Component Inspection". Is the inspection result normal? YES YES >> GO TO 8. NO >> Replace VIAS control solenoid valve 1. R					
Is the inspection result normal? YES >> Repair or replace power valve actuator 1. Refer to EC-17, "ENGINE CONTROL SYSTEM.: Component Parts Location". F NO >> GO TO 3. G 3. CHECK VACUUM TANK G 1. Stop engine and leit itide. Start engine and leit itide. 2. Check vacuum existence from intake manifold collector. H Dese vacuum existence from the intake manifold collector? YES YES >> GO TO 4. NO >> Replace intake manifold collector. Refer to EM-29. "Exploded View". 4. CHECK VACUUM HOSE I 1. Stop engine. J 2. Check vacuum hose for crack, clogging, improper connection or disconnection. Refer to EC-63. "WARIABLE INDUCTION AIR SYSTEM : System Description". Is the inspection result normal? YES YES >> GO TO 5. NO >> Repair hoses or tubes. J Check VIAS CONTROL SOLENOID VALVE 1 Check VIAS control solenoid valve 1. Refer to EC-432. "Component Inspection". Is the inspection result normal? YES >> GO TO 8. NO >> Replace VIAS control solenoid valve 1. Refer to EM-29. "Exploded View". 6. CHECK VACUUM EXISTENCE-II M Is the inspection resul					E
YES >> Repair or replace power valve actuator 1. Refer to EC-17, "ENGINE CONTROL SYSTEM : Component Parts Location". P NO >> GOT03. GOT03. 3. CHECK VACUUM TANK G 1. Stop engine and disconnect vacuum hose connected to intake manifold collector. H 2. Check vacuum existence from intake manifold collector? YES YES >> GOT04. H NO >> Replace intake manifold collector. Refer to EM-29, "Exploded View". I 4. CHECK VACUUM HOSE J Stop engine. J 1. Stop engine. J Check vacuum hose for crack, clogging, improper connection or disconnection. Refer to EC-65, "VARIABLE INDUCTION AIR SYSTEM : System Description". J Is the inspection result normal? YES >> GO T05. NO >> Repair hoses or tubes. M 5. CHECK VIAS CONTROL SOLENOID VALVE 1 M Check VIAS control solenoid valve 1. Refer to EM-29, "Exploded View". M YES >> GO T0 8. NO NO >> Replace VIAS control solenoid valve 1. Refer to EM-29, "Exploded View". O 6. CHECK VACUUM EXISTENCE-II M Ø with CONSULT Perform "VIAS SV-2' in "ACTIVE TEST" mode with CONSULT. P <			Not existed		
1. Stop engine and disconnect vacuum hose connected to intake manifold collector. 2. Start engine and let it idle. 3. Check vacuum existence from intake manifold collector? YES VES >> GO TO 4. NO >> Replace intake manifold collector. Refer to EM-29, "Exploded View". 4. CHECK VACUUM HOSE Improve the intake manifold collector. Refer to EM-29, "Exploded View". 1. Stop engine. Improve the intake manifold collector. All the inspection result normal? YES >> GO TO 5. NO >> Repair hoses or tubes. 5. CHECK VIAS CONTROL SOLENOID VALVE 1 Check VIAS control solenoid valve 1. Refer to EC-432. "Component Inspection". Is the inspection result normal? YES >> GO TO 8. NO >> Replace VIAS control solenoid valve 1. Refer to EM-29. "Exploded View". 6. CHECK VIAS control solenoid valve 1. Refer to EM-29. "Exploded View". 6. CHECK VACUUM EXISTENCE-II IP With CONSULT T. Stop engine and disconnect vacuum hose connected to power valve actuator 2. 2. Start engine and disconnect vacuum hose connected to power valve actuator 2. 3. Perform "VIAS Sol-02" in "ACTIVE TEST" mode with CONSULT. 4. Turn VIAS control solenoid valve 2 ON and OFF, and check vacuum existence under the following condi-	YES >> Repair or re ponent Par NO >> GO TO 3.	eplace power valve a ts Location".	ectuator 1. Refer to <u>EC-17</u>	7, "ENGINE CONTROL SYSTEM : Com-	F
 2. Start engine and let it idle. 3. Check vacuum existence from the intake manifold collector. H Does vacuum existence from the intake manifold collector? YES >> GO TO 4. NO >> Replace intake manifold collector. Refer to EM-29, "Exploded View". 4. CHECK VACUUM HOSE 1. Stop engine. 2. Check vacuum hose for crack, clogging, improper connection or disconnection. Refer to EC-56. "VARIABLE INDUCTION AIR SYSTEM : System Description". Is the inspection result normal? YES >> GO TO 5. NO >> Repair hoses or tubes. 5. CHECK VIAS CONTROL SOLENOID VALVE 1 Check VIAS control solenoid valve 1. Refer to EC-432. "Component Inspection". Is the inspection result normal? YES >> GO TO 8. NO >> Replace VIAS control solenoid valve 1. Refer to EM-29. "Exploded View". 6. CHECK VACUUM EXISTENCE-II With CONSULT 1. Stop engine and disconnect vacuum hose connected to power valve actuator 2. 2. Start engine and let it idle. 3. Perform "VIAS S/V-2" in "ACTIVE TEST" mode with CONSULT. 4. Turn VIAS control solenoid valve 2 ON and OFF, and check vacuum existence under the following condi- 	3. CHECK VACUUM T	ANK			G
 3. Check vacuum existence from intake manifold collector. Does vacuum existence from the intake manifold collector? YES >> GO TO 4. NO >> Replace intake manifold collector. Refer to EM-29. "Exploded View". 4. CHECK VACUUM HOSE 1. Stop engine. 2. Check vacuum hose for crack, clogging, improper connection or disconnection. Refer to EC-56. "VARIABLE INDUCTION AIR SYSTEM: System Description". Is the inspection result normal? YES >> GO TO 5. NO >> Repair hoses or tubes. 5. CHECK VIAS CONTROL SOLENOID VALVE 1 Check VIAS control solenoid valve 1. Refer to EC-432. "Component Inspection". Is the inspection result normal? YES >> GO TO 8. NO >> Replace VIAS control solenoid valve 1. Refer to EM-29. "Exploded View". 6. CHECK VACUUM EXISTENCE-II With CONSULT 1. Stop engine and disconnect vacuum hose connected to power valve actuator 2. 2. Stat engine and let it idle. 3. Perform "VIAS S/V-2" in "ACTIVE TEST" mode with CONSULT. 4. Turn VIAS control solenoid valve 2 ON and OFF, and check vacuum existence under the following condi- 			se connected to intake ma	anifold collector.	
Does vacuum existence from the intake manifold collector? YES >> GO TO 4. NO >> Replace intake manifold collector. Refer to EM-29, "Exploded View". 4. CHECK VACUUM HOSE 1. Stop engine. 2. Check vacuum hose for crack, clogging, improper connection or disconnection. Refer to EC-56, "VARIABLE INDUCTION AIR SYSTEM: System Description". Is the inspection result normal? YES >> GO TO 5. NO >> Repair hoses or tubes. L Check VIAS CONTROL SOLENOID VALVE 1 Check VIAS CONTROL SOLENOID VALVE 1 Check VIAS control solenoid valve 1. Refer to EM-29, "Exploded View". 6.CHECK VACUUM EXISTENCE-II Improper connection? Is the inspection result normal? YES >> GO TO 8. NO >> Replace VIAS control solenoid valve 1. Refer to EM-29, "Exploded View". 6.CHECK VACUUM EXISTENCE-II Improper value actuator 2. Stat engine and disconnect vacuum hose connected to power valve actuator 2. Stat engine and let it idle. 3. Perform "VIAS Solv-2" in "ACTIVE TEST" mode with CONSULT. Perform "VIAS control solenoid valve 2 ON and OFF, and check vacuum existence under the following condi-			anifold collector.		Н
NO >> Replace intake manifold collector. Refer to EM-29, "Exploded View". I 4.CHECK VACUUM HOSE . . 1. Stop engine. . . 2. Check vacuum hose for crack, clogging, improper connection or disconnection. Refer to EC-56, "VARIABLE INDUCTION AIR SYSTEM : System Description". . Is the inspection result normal? YES >> GO TO 5. . NO >> Repair hoses or tubes. . . 5.CHECK VIAS CONTROL SOLENOID VALVE 1 . . . Check VIAS control solenoid valve 1. Refer to EC-432. "Component Inspection". . . Is the inspection result normal? YES >> GO TO 8. . NO >> Replace VIAS control solenoid valve 1. Refer to EM-29, "Exploded View". . 6.CHECK VACUUM EXISTENCE-II . . . Image: State ngine and disconnect vacuum hose connected to power valve actuator 2. . . . 1. Stop engine and disconnect vacuum hose connected to power valve actuator 2. . . . 1. Stop engine and let it idle. 2. Perform "VIAS S/V-2" in "ACTIVE TEST" mode with CONSULT. . . .					
4.CHECK VACUUM HOSE J 1. Stop engine. J 2. Check vacuum hose for crack, clogging, improper connection or disconnection. Refer to EC-56. "VARIABLE INDUCTION AIR SYSTEM: System Description". J Is the inspection result normal? YES >> GO TO 5. NO >> Repair hoses or tubes. Improper connection K 5.CHECK VIAS CONTROL SOLENOID VALVE 1 Improper connection". M Check VIAS control solenoid valve 1. Refer to EC-432, "Component Inspection". N Is the inspection result normal? YES >> GO TO 8. N YES >> GO TO 8. NO >> Replace VIAS control solenoid valve 1. Refer to EM-29, "Exploded View". O 6.CHECK VACUUM EXISTENCE-II Improper valve actuator 2. P 1. Stop engine and let it idle. Perform "VIAS SV-2" in "ACTIVE TEST" mode with CONSULT. P 4. Turn VIAS control solenoid valve 2 ON and OFF, and check vacuum existence under the following condi- P					
1. Stop engine. J 2. Check vacuum hose for crack, clogging, improper connection or disconnection. Refer to EC-56. "VARIABLE INDUCTION AIR SYSTEM: System Description". J Is the inspection result normal? YES >> GO TO 5. NO >> Repair hoses or tubes. J 5.CHECK VIAS CONTROL SOLENOID VALVE 1 Clogging J Improper connection M 5.CHECK VIAS CONTROL SOLENOID VALVE 1 N N SEFIORL N 7YES >> GO TO 8. NO >> Replace VIAS control solenoid valve 1. Refer to EC-432. "Component Inspection". N N Step in proper connect vacuum hose connected to power valve actuator 2. O O O 6.CHECK VACUUM EXISTENCE-II Improper valve actuator 2. Perform "VIAS SV-2" in "ACTIVE TEST" mode with CONSULT. P 4. Turn VIAS control solenoid valve 2 ON and OFF, and check vacuum existence under the following condi- S P	A		or. Refer to <u>EM-29, "Explo</u>	oded View".	I
 2. Check vacuum hose for crack, clogging, improper connection or disconnection. Refer to EC-56, "VARIABLE INDUCTION AIR SYSTEM : System Description". Is the inspection result normal? YES >> GO TO 5. NO >> Repair hoses or tubes. 5. CHECK VIAS CONTROL SOLENOID VALVE 1 Check VIAS control solenoid valve 1. Refer to EC-432, "Component Inspection". Is the inspection result normal? YES >> GO TO 8. NO >> Replace VIAS control solenoid valve 1. Refer to EM-29, "Exploded View". 6. CHECK VACUUM EXISTENCE-II With CONSULT 1. Stop engine and disconnect vacuum hose connected to power valve actuator 2. 2. Start engine and let it idle. 3. Perform "VIAS S/V-2" in "ACTIVE TEST" mode with CONSULT. 4. Turn VIAS control solenoid valve 2 ON and OFF, and check vacuum existence under the following condi- 		OSE			
disconnection. Refer to EC-56, "VARIABLE INDUCTION AIR SYSTEM : System Description". Improve the inspection result normal? Is the inspection result normal? YES >> GO TO 5. NO >> Repair hoses or tubes. Improper connection 5.CHECK VIAS CONTROL SOLENOID VALVE 1 Improper connection Check VIAS control solenoid valve 1. Refer to EC-432, "Component Inspection". N Is the inspection result normal? YES >> GO TO 8. NO >> Replace VIAS control solenoid valve 1. Refer to EM-29, "Exploded View". O 6.CHECK VACUUM EXISTENCE-II Improver valve actuator 2. ? Start engine and let it idle. Perform "VIAS S/V-2" in "ACTIVE TEST" mode with CONSULT. 4. Turn VIAS control solenoid valve 2 ON and OFF, and check vacuum existence under the following condi-		e for crack clogging	improper connection or	[]	J
Is the inspection result normal? YES >> GO TO 5. NO >> Repair hoses or tubes. Improper connection SEFTOR Check VIAS CONTROL SOLENOID VALVE 1 Check VIAS control solenoid valve 1. Refer to EC-432. "Component Inspection". Is the inspection result normal? YES >> GO TO 8. NO >> Replace VIAS control solenoid valve 1. Refer to EM-29. "Exploded View". 6.CHECK VACUUM EXISTENCE-II Image: With CONSULT 1. Stop engine and disconnect vacuum hose connected to power valve actuator 2. 2. Start engine and let it idle. 3. Perform "VIAS S/V-2" in "ACTIVE TEST" mode with CONSULT. 4. Turn VIAS control solenoid valve 2 ON and OFF, and check vacuum existence under the following condi-	disconnection. Ref	er to <u>EC-56, "VARI</u>	ABLE INDUCTION AIR		
YES >> GO TO 5. NO >> Repair hoses or tubes. Improper connection Improper connection S.CHECK VIAS CONTROL SOLENOID VALVE 1 Check VIAS control solenoid valve 1. Refer to EC-432. "Component Inspection". Is the inspection result normal? YES >> GO TO 8. NO >> Replace VIAS control solenoid valve 1. Refer to EM-29. "Exploded View". 6.CHECK VACUUM EXISTENCE-II Improper and disconnect vacuum hose connected to power valve actuator 2. Start engine and let it idle. Perform "VIAS S/V-2" in "ACTIVE TEST" mode with CONSULT. 4. Turn VIAS control solenoid valve 2 ON and OFF, and check vacuum existence under the following condi-				Split	Κ
NO >> Repair hoses or tubes. Clogging L M Improper connection M 5.CHECK VIAS CONTROL SOLENOID VALVE 1 M Check VIAS control solenoid valve 1. Refer to EC-432. "Component Inspection". N Is the inspection result normal? YES >> GO TO 8. NO >> Replace VIAS control solenoid valve 1. Refer to EM-29. "Exploded View". O 6.CHECK VACUUM EXISTENCE-II P 1. Stop engine and let it idle. Start engine and let it idle. 3. Perform "VIAS S/V-2" in "ACTIVE TEST" mode with CONSULT. P 4. Turn VIAS control solenoid valve 2 ON and OFF, and check vacuum existence under the following condi-		<u>normal?</u>			
5.CHECK VIAS CONTROL SOLENOID VALVE 1 Check VIAS control solenoid valve 1. Refer to EC-432. "Component Inspection". Is the inspection result normal? YES >> GO TO 8. NO >> Replace VIAS control solenoid valve 1. Refer to EM-29. "Exploded View". 6.CHECK VACUUM EXISTENCE-II Image: Start engine and disconnect vacuum hose connected to power valve actuator 2. 2. Start engine and let it idle. 3. Perform "VIAS S/V-2" in "ACTIVE TEST" mode with CONSULT. 4. Turn VIAS control solenoid valve 2 ON and OFF, and check vacuum existence under the following condi-		es or tubes.			
5.CHECK VIAS CONTROL SOLENOID VALVE 1 Check VIAS control solenoid valve 1. Refer to EC-432. "Component Inspection". Is the inspection result normal? YES >> GO TO 8. NO >> Replace VIAS control solenoid valve 1. Refer to EM-29. "Exploded View". 6.CHECK VACUUM EXISTENCE-II With CONSULT 1. Stop engine and disconnect vacuum hose connected to power valve actuator 2. 2. Start engine and let it idle. 3. Perform "VIAS S/V-2" in "ACTIVE TEST" mode with CONSULT. 4. Turn VIAS control solenoid valve 2 ON and OFF, and check vacuum existence under the following condi-					L
Check VIAS control solenoid valve 1. Refer to EC-432. "Component Inspection". N Is the inspection result normal? YES >> GO TO 8. NO >> Replace VIAS control solenoid valve 1. Refer to EM-29. "Exploded View". O 6.CHECK VACUUM EXISTENCE-II P 1. Stop engine and disconnect vacuum hose connected to power valve actuator 2. P 2. Start engine and let it idle. 3. Perform "VIAS S/V-2" in "ACTIVE TEST" mode with CONSULT. 4. Turn VIAS control solenoid valve 2 ON and OFF, and check vacuum existence under the following condi-					M
Check VIAS control solenoid valve 1. Refer to EC-432. "Component Inspection". N Is the inspection result normal? YES >> GO TO 8. NO >> Replace VIAS control solenoid valve 1. Refer to EM-29. "Exploded View". O 6.CHECK VACUUM EXISTENCE-II P 1. Stop engine and disconnect vacuum hose connected to power valve actuator 2. P 2. Start engine and let it idle. 3. Perform "VIAS S/V-2" in "ACTIVE TEST" mode with CONSULT. 4. Turn VIAS control solenoid valve 2 ON and OFF, and check vacuum existence under the following condi-	5. CHECK VIAS CONT	ROL SOLENOID VA	LVE 1		
Is the inspection result normal? YES >> GO TO 8. O NO >> Replace VIAS control solenoid valve 1. Refer to EM-29, "Exploded View". O 6.CHECK VACUUM EXISTENCE-II P 1. Stop engine and disconnect vacuum hose connected to power valve actuator 2. P 2. Start engine and let it idle. 3. Perform "VIAS S/V-2" in "ACTIVE TEST" mode with CONSULT. P 4. Turn VIAS control solenoid valve 2 ON and OFF, and check vacuum existence under the following condi-				nspection".	Ν
NO >> Replace VIAS control solenoid valve 1. Refer to EM-29. "Exploded View". O 6.CHECK VACUUM EXISTENCE-II P 1. Stop engine and disconnect vacuum hose connected to power valve actuator 2. P 2. Start engine and let it idle. S/V-2" in "ACTIVE TEST" mode with CONSULT. 3. Perform "VIAS S/V-2" in "ACTIVE TEST" mode with CONSULT. Image: Constrained on the following conditional constrained on the following constrained on the followi					
NO >> Replace VIAS control solenoid valve 1. Refer to EM-29, "Exploded View". 6.CHECK VACUUM EXISTENCE-II Image: Start engine and disconnect vacuum hose connected to power valve actuator 2. 2. Start engine and let it idle. 3. Perform "VIAS S/V-2" in "ACTIVE TEST" mode with CONSULT. 4. Turn VIAS control solenoid valve 2 ON and OFF, and check vacuum existence under the following condi-					\cap
 With CONSULT Stop engine and disconnect vacuum hose connected to power valve actuator 2. Start engine and let it idle. Perform "VIAS S/V-2" in "ACTIVE TEST" mode with CONSULT. Turn VIAS control solenoid valve 2 ON and OFF, and check vacuum existence under the following condi- 	^ '		valve 1. Refer to <u>EM-29, "</u>	Exploded View".	0
 Stop engine and disconnect vacuum hose connected to power valve actuator 2. Start engine and let it idle. Perform "VIAS S/V-2" in "ACTIVE TEST" mode with CONSULT. Turn VIAS control solenoid valve 2 ON and OFF, and check vacuum existence under the following condi- 		XISTENCE-II			
	 Stop engine and dis Start engine and let Perform "VIAS S/V- Turn VIAS control statement 	t it idle. -2" in "ACTIVE TEST	" mode with CONSULT.		Ρ

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

VIAS S/V 2	Vacuum
ON	Existed
OFF	Not existed

Without CONSULT

- 1. Stop engine and disconnect vacuum hose connected to power valve actuator 2.
- 2. Disconnect VIAS control solenoid valve 1 harness connector.
- 3. Start engine.
- 4. Rev engine quickly up to approximately 5,000 rpm.
- 5. Check vacuum existence under the following conditions.

Condition	Operation
Idle	Existed
Rev engine quickly up to approximately 5,000 rpm	Not existed

Is the inspection result normal?

YES >> Repair or replace power valve actuator 2. Refer to <u>EC-17, "ENGINE CONTROL SYSTEM : Component Parts Location"</u>.

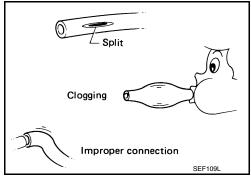
NO >> GO TO 7.

7. CHECK VACUUM HOSE

- 1. Stop engine.
- Check vacuum hose for crack, clogging, improper connection or disconnection. Refer to <u>EC-56</u>, <u>"VARIABLE INDUCTION AIR</u> <u>SYSTEM : System Description"</u>.

Is the inspection result normal?

- YES >> GO TO 8.
- NO >> Repair hoses or tubes.



8.CHECK VIAS CONTROL SOLENOID VALVE 2

Check VIAS control solenoid valve 2. Refer to <u>EC-434, "Component Inspection"</u>. Is the inspection result normal?

- YES >> Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u>.
- NO >> Replace VIAS control solenoid valve 2. Refer to EM-29, "Exploded View".

< SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS ENGINE CONTROL SYSTEM SYMPTOMS

Symptom Table

SYSTEM — BASIC ENGINE CONTROL SYSTEM

							S	YMPT	OM							С
		(1				NOI					HIGH					D
		START/RESTART (EXCP. HA)		LAT SPOT	TION	POWER/POOR ACCELERATION				DLE	MPERATURE	UMPTION	MPTION	(CHARGE)		E
		RT/RESTA	1	URGING/F	K/DETONA	/ER/POOR	W IDLE	HUNTING	TION	furn to II	NATER TEI	NEL CONS	IL CONSUI	ND (UNDER	Reference page	F
		HARD/NO STA	ENGINE STALL	HESITATION/SURGING/FLAT	SPARK KNOCK/DETONATION	LACK OF POW	HIGH IDLE/LOW IDLE	ROUGH IDLE/HUNTING	IDLING VIBRATION	SLOW/NO RETURN TO IDLE	OVERHEATS/WATER TEMPERATURE	EXCESSIVE FUEL CONSUMPTION	EXCESSIVE OIL CONSUMPTION	BATTERY DEAD (UNDER CHARGE)		G
Warrant	y symptom code	AA	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	HA		
Fuel	Fuel pump circuit	1	1	2	3	2		2	2			3		2	<u>EC-482</u>	
	Fuel pressure regulator system	3	3	4	4	4	4	4	4	4		4			<u>EC-153</u>	1
	Fuel injector circuit	1	1	2	3	2		2	2			2			<u>EC-479</u>	
	Evaporative emission system	3	3	4	4	4	4	4	4	4		4			<u>EC-51</u>	.1
Air	Positive crankcase ventilation sys- tem	3	3	4	4	4	4	4	4	4		4	1		<u>EC-32</u>	0
	Incorrect idle speed adjustment						1	1	1	1		1			<u>EC-141</u>	Κ
	Electric throttle control actuator	1	1	2	3	3	2	2	2	2		2		2	<u>EC-443,</u> <u>EC-448</u>	IX
Ignition	Incorrect ignition timing adjustment	3	3	1	1	1		1	1			1			<u>EC-141</u>	
	Ignition circuit	1	1	2	2	2		2	2			2			<u>EC-484</u>	_
Power s	supply and ground circuit	2	2	3	3	3		3	3		2	3			<u>EC-175</u>	
Mass ai	r flow sensor circuit	1			2										<u>EC-201,</u> <u>EC-206</u>	M
Engine	coolant temperature sensor circuit						3			3					<u>EC-217,</u> <u>EC-222</u>	Ν
Air fuel	ratio (A/F) sensor 1 circuit		1	2	3	2		2	2			2			EC-229, EC-233, EC-236, EC-261, EC-437	0
Throttle	position sensor circuit						2	† 		2					EC-219, EC-287, EC-394, EC-395, EC-455	Ρ
Accelera	ator pedal position sensor circuit			3	2	1									EC-379, EC-450, EC-452, EC-457	

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< SYMPTOM DIAGNOSIS >

[VQ35DE]

						S١	YMPT	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	HA		
Knock sensor circuit			2								3			EC-296	
Engine oil temperature sensor			4		2						3			<u>EC-281,</u> <u>EC-285</u>	
Crankshaft position sensor (POS) circuit	2	2												EC-298	
Camshaft position sensor (PHASE) circuit	3	2												EC-301	
Vehicle speed signal circuit		2	3		3						3			<u>EC-351</u>	
ECM	2	2	3	3	3	3	3	3	3	3	3			_	
Intake valve timing control solenoid valve cir- cuit		3	2		1	3	2	2	3		3			<u>EC-196</u>	
Intake valve timing intermediate lock control solenoid valve circuit														<u>EC-366</u>	
Exhaust valve timing control solenoid valve		3	2		1	3	2	2	3		3			<u>EC-198</u>	
PNP signal circuit			3		3		3	3			3			<u>EC-381</u>	
VIAS control solenoid valve 1 circuit					1									<u>EC-431</u>	
VIAS control solenoid valve 2 circuit					1									<u>EC-433</u>	
Refrigerant pressure sensor circuit		2				3			3		4			<u>EC-495</u>	
Electrical load signal circuit							3							<u>EC-474</u>	
Air conditioner circuit	2	2	3	3	3	3	3	3	3		3		2	<u>HAC-56</u>	
ABS actuator and electric unit (control unit)			4											<u>BRC-30</u>	

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

(continued on next page)

SYSTEM — ENGINE MECHANICAL & OTHER

< SYMPTOM DIAGNOSIS >

[VQ35DE]

							SY	ΜPT(MC							А	
		P. HA)		Ц		ERATION					URE HIGH	z		E)		EC	
		HARD/NO START/RESTART (EXCP. HA)		HESITATION/SURGING/FLAT SPOT	NATION	LACK OF POWER/POOR ACCELERATION		NG		O IDLE	OVERHEATS/WATER TEMPERATURE	EXCESSIVE FUEL CONSUMPTION	SUMPTION	DER CHARGE)	Reference	С	
) START/RE	STALL	ON/SURGIN	SPARK KNOCK/DETONATION	POWER/PC	HIGH IDLE/LOW IDLE	ROUGH IDLE/HUNTING	IDLING VIBRATION	SLOW/NO RETURN TO IDLE	ATS/WATER	VE FUEL CO	EXCESSIVE OIL CONSUMPTION	BATTERY DEAD (UNDER	page	D	
		HARD/NC	ENGINE STALL	HESITATI	SPARK K	LACK OF	HIGH IDI	ROUGHI	IDLING V	SLOW/NG	OVERHE,	EXCESSI	EXCESSI	BATTERY		E	
Warranty s	ymptom code	AA	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	HA	•	F	
Fuel	Fuel tank	5													<u>FL-14</u>		
	Fuel piping	5		5	5	5		5	5			5			<u>MA-16</u>		
	Vapor lock		5												_	G	
	Valve deposit														_		
•	Poor fuel (Heavy weight gaso- line, Low octane)	5		5	5	5		5	5			5			_	Н	
Air	Air duct														<u>EM-27</u>		
	Air cleaner		5												<u>EM-27</u>		
	Air leakage from air duct (Mass air flow sensor — electric throttle control actuator)			5		5		5	5			5			<u>EM-27</u>	I	
	Electric throttle control actuator	5			5		5			5					<u>EM-30</u>	J	
	Air leakage from intake manifold/ Collector/Gasket														<u>EM-30,</u> <u>EM-32</u>	K	
Cranking	Battery	1	1	1		1		1	1					1	<u>PG-136</u>		
	Generator circuit	1		•				•	-					•	<u>CHG-18</u>		
	Starter circuit	3										1			<u>STR-11,</u> <u>STR-14</u>	L	
	Signal plate	6													<u>EM-104</u>		
	PNP signal	4													<u>TM-94</u>	M	
Engine	Cylinder head	5	5	5	5	5		5	5			5			EM-97		
	Cylinder head gasket	5	5	5	5	5		5	5		4	5	3			Ν	
	Cylinder block																
	Piston												4				
	Piston ring	6	6	6	6	6		6	6			6			EM 100	0	
	Connecting rod	0	U	0	0	0		0	0			U			<u>EM-109</u>		
	Bearing Crankshaft																Ρ

< SYMPTOM DIAGNOSIS >

[VQ35DE]

		SYMPTOM													
		HARD/NO START/RESTART (EXCP. HA)	ENGINE STALL	HESITATION/SURGING/FLAT SPOT	SPARK KNOCK/DETONATION	LACK OF POWER/POOR ACCELERATION	HIGH IDRE/LOW IDLE	ROUGH IDLE/HUNTING	IDLING VIBRATION	SLOW/NO RETURN TO IDLE	OVERHEATS/WATER TEMPERATURE HIGH	EXCESSIVE FUEL CONSUMPTION	EXCESSIVE OIL CONSUMPTION	BATTERY DEAD (UNDER CHARGE)	Reference page
Warranty s	symptom code	AA	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	HA	
Valve	Timing chain	- 5		5	5	5		5				5	3		<u>EM-85</u>
mecha- nism	Camshaft		5						5						<u>EM-88</u>
	Intake valve timing control														<u>EM-69</u>
	Exhaust valve timing control														
	Intake valve														EM-97
	Exhaust valve														
Exhaust	Exhaust manifold/Tube/Muffler/ Gasket	5	5	5	5	5		5	5			5			<u>EM-34, EX-</u> <u>4</u>
	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			<u>LU-8, LU-</u> <u>11, LU-12, LU-14</u>
	Oil level (Low)/Filthy oil														<u>LU-8</u>
Cooling	Radiator/Hose/Radiator filler cap	5	5	5	5	5									<u>CO-13</u>
	Thermostat									5	4 5				<u>CO-25</u>
	Water pump											5			<u>CO-20</u>
	Water gallery							5	5						<u>CO-2</u>
	Cooling fan														<u>CO-18</u>
	Coolant level (Low)/Contaminat- ed coolant									5					<u>CO-9</u>
NVIS (NISSAN Vehicle Immobilizer System — NATS)		1	1												<u>SEC-15</u>

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

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

NORMAL OPERATING CONDITION

Description

FUEL CUT CONTROL (AT NO LOAD AND HIGH ENGINE SPEED)

If the engine speed is above 2,000 rpm under no load (for example, the selector lever position is P or N and engine speed is over 2,000 rpm) fuel will be cut off after some time. The exact time when the fuel is cut off varies based on engine speed.

Fuel cut will be operated until the engine speed reaches 1,100 rpm, then fuel cut will be cancelled. **NOTE:**

This function is different from deceleration control listed under Multiport Fuel Injection (MFI) System, <u>EC-42.</u> <u>"MULTIPORT FUEL INJECTION SYSTEM : System Description"</u>.

[VQ35DE]

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PERIODIC MAINTENANCE IDLE SPEED

Work Procedure

1.CHECK IDLE SPEED

With CONSULT
Check idle speed in "DATA MONITOR" mode with CONSULT.
With GST
Check idle speed with Service \$01 of GST.

>> INSPECTION END

< PERIODIC MAINTENANCE >

IGNITION TIMING

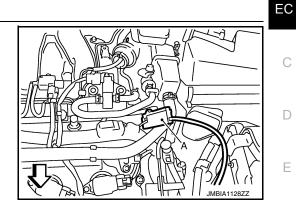
Work Procedure

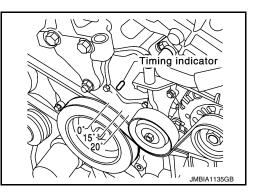
1. CHECK IGNITION TIMING

- Attach timing light to loop wires as shown. 1.
- Timing light (A)
- <⊐: Vehicle front

2. Check ignition timing.







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< PERIODIC MAINTENANCE >

EVAP LEAK CHECK

Work Procedure

CAUTION:

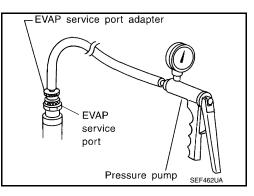
- Never use compressed air or a high pressure pump.
- Never exceed 4.12 kPa (0.042 kg/cm², 0.6 psi) of pressure in EVAP system.

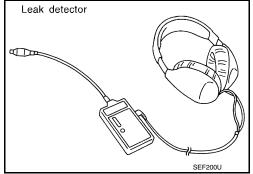
NOTE:

- · Do not start engine.
- Improper installation of EVAP service port adapter (commercial service tool) to the EVAP service port may cause a leakage.

(I) WITH CONSULT

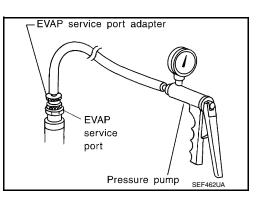
- To locate the EVAP leakage, install EVAP service port adapter (commercial service tool) and pressure pump to EVAP service port.
- 2. Turn ignition switch ON.
- 3. Select the "EVAP SYSTEM CLOSE" of "WORK SUPPORT MODE" with CONSULT.
- 4. Touch "START". A bar graph (Pressure indicating display) will appear on the screen.
- 5. Apply positive pressure to the EVAP system until the pressure indicator reaches the middle of the bar graph.
- 6. Remove EVAP service port adapter (commercial service tool) and hose with pressure pump.
- Locate the leakage using a leakage detector (commercial service tool). Refer to <u>EC-51, "EVAPORATIVE EMISSION SYS-</u> <u>TEM : System Description"</u>.





WITHOUT CONSULT

- 1. To locate the EVAP leakage, install EVAP service port adapter (commercial service tool) and pressure pump to EVAP service port.
- 2. Apply battery voltage between the terminals of EVAP canister vent control valve to make a closed EVAP system.
- To locate the leakage, deliver positive pressure to the EVAP system until pressure gauge points reach 1.38 to 2.76 kPa (0.014 to 0.028 kg/cm², 0.2 to 0.4 psi).
- 4. Remove EVAP service port adapter (commercial service tool) and hose with pressure pump.

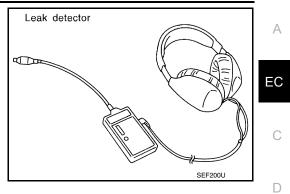


IVQ35DE1

EVAP LEAK CHECK

< PERIODIC MAINTENANCE >

5. Locate the leakage using a leak detector (commercial service tool). Refer to <u>EC-51</u>, "EVAPORATIVE EMISSION SYSTEM : <u>System Description</u>".



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< PERIODIC MAINTENANCE >

POSITIVE CRANKCASE VENTILATION

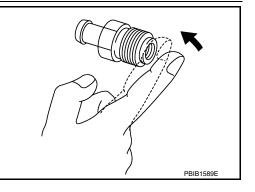
Work Procedure

1.CHECK PCV 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.

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Replace PCV valve. Refer to .<u>EM-54, "Exploded View"</u>



REMOVAL AND INSTALLATION ECM

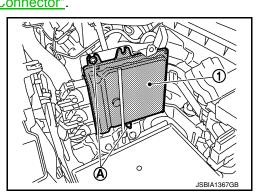
Removal and Installation

CAUTION:

Perform ADDITIONAL SERVICE WHEN REPLACING ECM. Refer to EC-145, "Description".

REMOVAL

- 1. Remove battery. Refer to PG-136. "Exploded View".
- 2. Disconnect ECM harness connectors. Refer to PG-6, "Harness Connector".
- 3. Remove ECM mounting nuts (1), and then remove ECM (A).



INSTALLATION Install in the reverse order of removal. А

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[VQ35DE]

SERVICE DATA AND SPECIFICATIONS (SDS)

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SERVICE DATA AND SPECIFICATIONS (SDS) SERVICE DATA AND SPECIFICATIONS (SDS)

Idle Speed

INFOID:000000012406681

[VQ35DE]

Condition	Specification
No load* (in P or N position)	650 ± 50 rpm

*: Under the following conditions

• A/C switch: OFF

• Electric load: OFF (Lights, heater fan & rear window defogger)

• Steering wheel: Kept in straight-ahead position

Ignition Timing

INFOID:000000012406682

Condition	Specification
No load* (in P or N position)	$12 \pm 2^{\circ} BTDC$

*: Under the following conditions

• A/C switch: OFF

• Electric load: OFF (Lights, heater fan & rear window defogger)

Steering wheel: Kept in straight-ahead position

Calculated Load Value

INFOID:000000012406683

Condition	Specification (Using CONSULT or GST)
At idle	10 – 35 %
At 2,500 rpm	10 – 35 %

Mass Air Flow Sensor

INFOID:000000012406684

Supply voltage	Battery voltage (11 – 14 V)				
Output frequency at idle (in N position)	4,100 – 4,700 Hz*				
Mass air flow (Using CONSULT or GST)	2.0 – 6.0 g/s at idle* 7.0 – 20.0 g/s at 2,500 rpm*				

*: Engine is warmed up to normal operating temperature and running under no load.