SECTION ECEC ENGINE CONTROL SYSTEM o

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PRECAUTION PRECAUTIONS

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

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. Information necessary to service the system safely is included in the SR and SB section of this Service Manual.

WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, it is recommended that all maintenance and repair be performed by an authorized NISSAN/INFINITI dealer.
- Improper repair, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SR section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

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

WARNING:

- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the battery or batteries, and wait at least three minutes before performing any service.

On Board Diagnostic (OBD) System of Engine and CVT

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.)
- 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-9</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.
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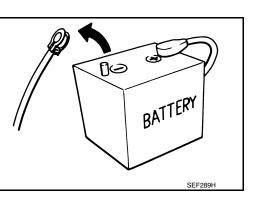
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PRECAUTIONS

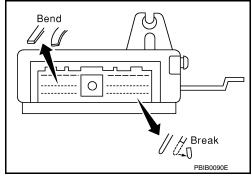
< PRECAUTION >

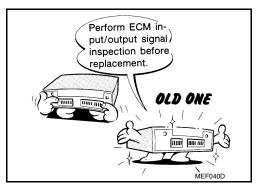
General Precautions

- 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 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 EC-86, "Reference Value".
- Handle mass air flow sensor carefully to avoid damage.
- Never clean mass air flow sensor with any type of detergent.
- Never disassemble electric throttle control actuator.
- Even a slight leakage in the air intake system can cause serious incidents.
- Never shock or jar the camshaft position sensor (PHASE), crankshaft position sensor (POS).





PRECAUTIONS

< PRECAUTION >

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- After performing each TROUBLE DIAGNOSIS, perform DTC **Confirmation Procedure or Component Function Check.** А 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. EC SAT652J D Е Battery voltage F Ð Harness connector Short for solenoid valve ECM Н NG Solenoid valve OK Circuit tester Ī SEF348N Κ Cylinder number and Bank layout Bank 1 L Bank 2 6 Μ 4 Front Ν Crankshaft pulley SEC893C Ο
- When measuring ECM signals with a circuit tester, never allow the two tester probes to contact.

Accidental contact of probes will cause a short circuit and damage the ECM power transistor.

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

PRECAUTIONS

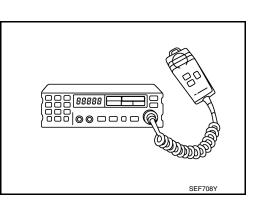
< PRECAUTION >

- Never depress accelerator pedal when starting.
- Immediately after starting, never rev up engine unnecessarily.
- Never rev up engine just prior to shutdown.

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- 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

< PREPARATION >

PREPARATION PREPARATION

Special Service Tools

The actual shape of the tools may differ from those illustrated here.

Tool number (TechMate No.) Tool name		Description
— (J-44321) Fuel pressure gauge kit	LEC642	Checks fuel pressure
 (J-44321-6) Fuel pressure adapter	LBIA0376E	Connects fuel pressure gauge to quick connector type fuel lines
ommercial Service	e Tools	INFOID:0000000119396;
Tool name		
(TechMate No.)		Description
(TechMate No.) Quick connector re- lease (J-45488)	PBIC0198E	Description Removes fuel tube quick connectors in engine room
(TechMate No.) Quick connector re- lease	PBIC0198E	Removes fuel tube quick connectors in engine
(TechMate No.) Quick connector re- lease (J-45488) Leak detector		Removes fuel tube quick connectors in engine room

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PREPARATION

< PREPARATION >

Tool name (TechMate No.)		Description
Fuel filler cap adapter i.e.: (J-42909)		Checks fuel tank vacuum relief valve opening pressure
	ALBIA1353ZZ	
Socket wrench (—)	19 mm (0.75 in) 19 mm (0.75 in) 19 mm 19 mm 19 mm 19 mm 10 re than 32 mm (1.26 in) 19 s-NT705	Removes and installs engine coolant temperature sensor. Refer to <u>CO-25. "Exploded View"</u> .

COMPONENT PARTS [VQ35DE] < SYSTEM DESCRIPTION > SYSTEM DESCRIPTION А **COMPONENT PARTS** ENGINE CONTROL SYSTEM EC **ENGINE CONTROL SYSTEM : Component Parts Location** INFOID:000000011939620 **ENGINE ROOM** С D (8) (6)Е F G

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No.	Component	Function
1	IPDM E/R	 IPDM E/R control the internal relays and the actuators. Refer to <u>PCS-7, "RELAY CONTROL SYSTEM : System Description"</u>. When CAN communication with ECM is impossible, IPDM E/R performs fail-safe control. Refer to <u>PCS-20, "Fail Safe"</u>.
2	Mass air flow sensor (with intake air temperature sensor)	EC-29. "Mass Air Flow Sensor (With Intake Air Temperature Sen- sor)"
3	Electric throttle control actuator	EC-23. "Electric Throttle Control Actuator"
4	Power valve actuator 2	EC-30, "Power Valve Actuator 1 and 2"
5	EVAP canister purge volume control solenoid valve	EC-25. "EVAP Canister Purge Volume Control Solenoid Valve"
6	VIAS control solenoid valve 2	EC-30, "VIAS Control Solenoid Valve 1 and 2"
7	VIAS control solenoid valve 1	EC-30, "VIAS Control Solenoid Valve 1 and 2"
8	ABS actuator and electric unit (control unit)	 Mainly transmits the following signal to ECM via CAN communication. VDC operation signal TCS operation signal Refer to <u>BRC-10. "Component Parts Location"</u> (without ICC), <u>BRC-178. "Component Parts Location"</u> (with ICC) for detailed installation location.

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< SYSTEM DESCRIPTION >

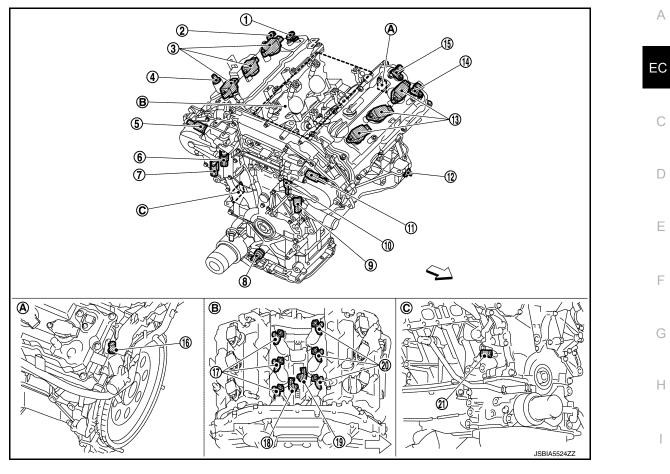
No.	Component	Function
9	Power steering oil pump assembly (with power steering control module)	 Mainly transmits the following signal to ECM via CAN communication. EPS operation signal Refer to <u>STC-4, "Component Parts Location"</u> for detailed installation location.
10	Electronic controlled engine mount control solenoid valve	EC-23, "Electronic Controlled Engine Mount"
11	Power valve actuator 1	EC-30, "Power Valve Actuator 1 and 2"
12	Cooling fan motor-2	EC-22, "Cooling Fan Motor"
(13)	Cooling fan motor-1	EC-22, "Cooling Fan Motor"
14	ТСМ	 Mainly transmits the following signal to ECM via CAN communication. Self diagnosis signal Shift position signal Output shaft revolution signal Drive mode signal Refer to TM-12, "CVT CONTROL SYSTEM : Component Parts Location" for detailed installation location.
15	ECM	EC-22, "ECM"
16	Refrigerant pressure sensor	EC-30. "Refrigerant Pressure Sensor" Refer to <u>HAC-9. "Component Parts Location"</u> for detailed installa- tion location.
17	Battery current sensor (with battery temperature sensor)	EC-21, "Battery Current Sensor (With Battery Temperature Sen- sor)"
(18)	Cooling fan relay-2	
(19)	Cooling fan relay-3	

ENGINE

< SYSTEM DESCRIPTION >

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

∠ : Vehicle front

No.	Component	Function
1	Camshaft position sensor (PHASE) (bank 1)	EC-21, "Camshaft Position Sensor (PHASE)"
2	Exhaust valve timing control position sensor (bank 1)	EC-28, "Exhaust Valve Timing Control Position Sensor"
3	Ignition coil (with power transistor) (bank 1)	EC-27, "Ignition Coil (With Power Transistor)"
4	PCV valve	EC-31, "Positive Crankcase Ventilation (PCV)"
5	Intake valve timing intermediate lock control solenoid valve (bank 1)	EC-28. "Intake Valve Timing Intermediate Lock Control Solenoid Valve"
6	Intake valve timing control solenoid valve (bank 1)	EC-27, "Intake Valve Timing Control Solenoid Valve"
\bigcirc	Exhaust valve timing control solenoid valve (bank 1)	EC-28, "Exhaust Valve Timing Control Solenoid Valve"
8	Engine oil pressure sensor	EC-24, "Engine Oil Pressure Sensor"
9	Exhaust valve timing control solenoid valve (bank 2)	EC-28, "Exhaust Valve Timing Control Solenoid Valve"
10	Intake valve timing control solenoid valve (bank 2)	EC-27, "Intake Valve Timing Control Solenoid Valve"
11	Intake valve timing intermediate lock control solenoid valve (bank 2)	EC-28, "Intake Valve Timing Intermediate Lock Control Solenoid Valve"
(12)	Crankshaft position sensor (POS)	EC-22, "Crankshaft Position Sensor (POS)"
13	Ignition coil (with power transistor) (bank 2)	EC-27, "Ignition Coil (With Power Transistor)"
14)	Exhaust valve timing control position sensor (bank 2)	EC-28, "Exhaust Valve Timing Control Position Sensor"
(15)	Camshaft position sensor (PHASE) (bank 2)	EC-21. "Camshaft Position Sensor (PHASE)"

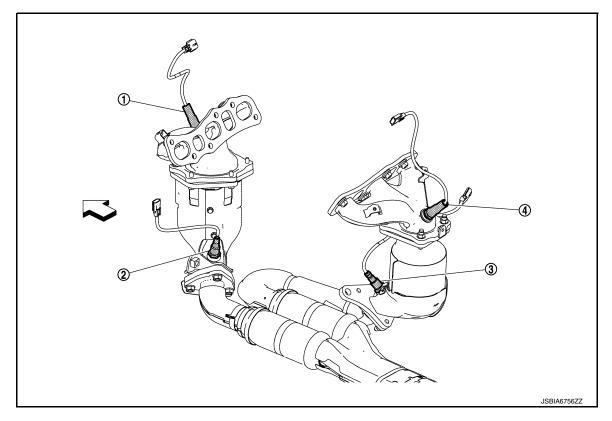
Revision: October 2015

2016 Maxima NAM

< SYSTEM DESCRIPTION >

No.	Component	Function
16	Engine coolant temperature sensor	EC-24, "Engine Coolant Temperature Sensor"
17	Fuel injector (bank 1)	EC-26, "Fuel Injector"
18	Knock sensor (bank 1)	EC-28. "Knock Sensor"
(19)	Knock sensor (bank 2)	EC-28, "Knock Sensor"
20	Fuel injector (bank 2)	EC-26, "Fuel Injector"
21)	Engine oil temperature sensor	EC-24. "Engine Oil Temperature Sensor"

EXHAUST

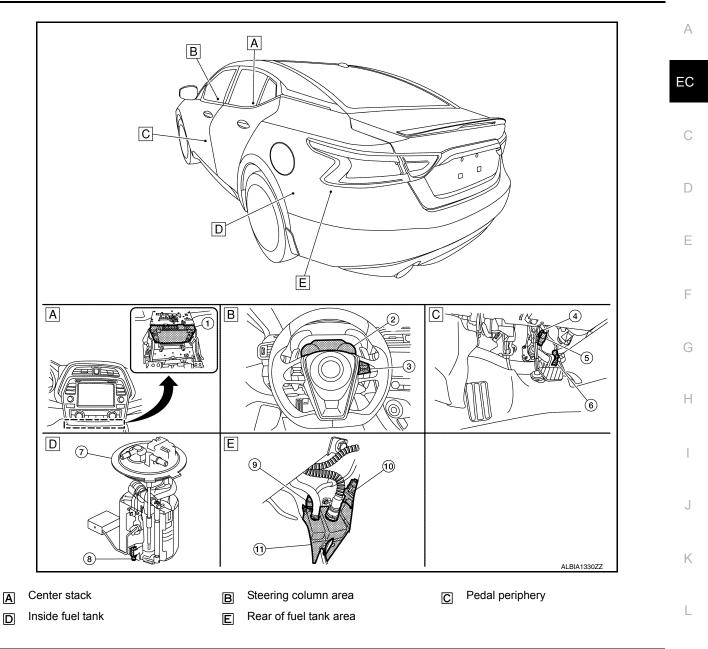


No.	Component	Function
1	Air fuel ratio (A/F) sensor 1 (bank 2)	EC-20, "Air Fuel Ratio (A/F) Sensor 1"
2	Heated oxygen sensor 2 (bank 2)	EC-26, "Heated Oxygen Sensor 2"
3	Heated oxygen sensor 2 (bank 1)	EC-26, "Heated Oxygen Sensor 2"
4	Air fuel ratio (A/F) sensor 1 (bank 1)	EC-20, "Air Fuel Ratio (A/F) Sensor 1"

BODY

< SYSTEM DESCRIPTION >

[VQ35DE]



No.	Component	Function	M
1	AC auto amp	 Mainly transmits the following signal to ECM via CAN communication. A/C ON signal Blower fan ON signal Refer to <u>HAC-9, "Component Parts Location"</u> for detailed installation location. 	Ν
2	Combination meter	 Mainly transmits the following signal to ECM via CAN communication. Vehicle speed signal Fuel lever sensor signal Fuel filler cap warning reset signal Mainly receives the following signal from ECM via CAN communication. Malfunction indicator lamp signal Engine oil pressure warning signal Fuel filler cap warning display signal ASCD status signal Refer to <u>MWI-5, "METER SYSTEM : Component Parts Location"</u> for detailed installation location. 	P

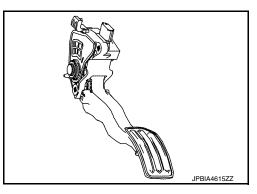
< SYSTEM DESCRIPTION >

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No.	Component	Function
3	ASCD steering switch	EC-21, "ASCD Steering Switch"
4	Stop lamp switch	EC-30, "Stop Lamp Switch & Brake Pedal Position Switch"
5	Brake pedal position switch	EC-30. "Stop Lamp Switch & Brake Pedal Position Switch"
6	Accelerator pedal position sensor	EC-20, "Accelerator Pedal Position Sensor"
7	Fuel level sensor unit and fuel pump (with fuel tank temper- ature sensor)	EC-26, "Fuel Level Sensor Unit and Fuel Pump (With Fuel Tank Temperature Sensor)"
8	Fuel tank temperature sensor	Refer to <u>FL-5, "Exploded View"</u> for detailed installation location.
9	EVAP control system pressure sensor	EC-25. "EVAP Control System Pressure Sensor"
10	EVAP canister vent control valve	EC-25, "EVAP Canister Vent Control Valve"
11	EVAP canister	EC-25, "EVAP Canister"

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.

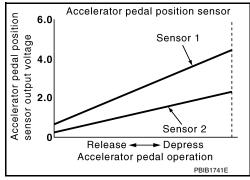
Air Fuel Ratio (A/F) Sensor 1

DESCRIPTION

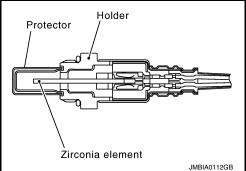
The air fuel ratio (A/F) sensor 1 is a planar one-cell limit current sensor. The sensor element of the A/F sensor 1 is composed an electrode layer, which transports ions. It has a heater in the element.

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

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

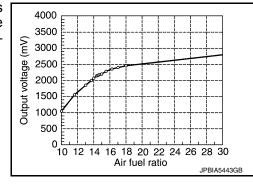


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< SYSTEM DESCRIPTION >

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°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.

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.

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 Н charging/discharging current of the battery.

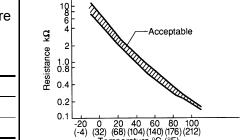
BATTERY TEMPERATURE SENSOR

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



20

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

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.

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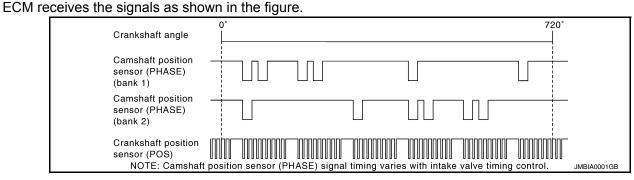
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K 0 20 40 60 80 100 (32) (68) (104) (140) (176) (212) Temperature °C (°F) SEF012P INFOID:000000011939625 M

< SYSTEM DESCRIPTION >



Cooling Fan Motor

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 operates at each speed when the current flows in the cooling fan motor.

Refer to EC-42. "COOLING FAN CONTROL : System Description" for cooling fan operation.

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.

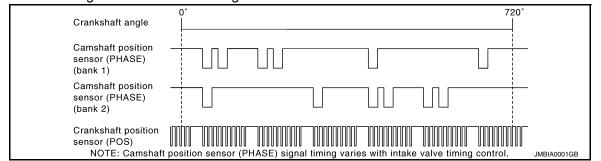
When the engine is running, the high and low parts of the teeth cause the gap with the sensor to change.

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

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

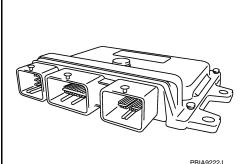
The ECM receives the voltage signal and detects the fluctuation of the engine revolution.

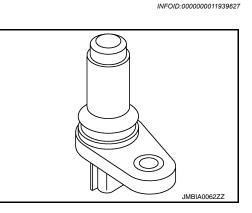
ECM receives the signals as shown in the figure.



ECM

- 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.





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< SYSTEM DESCRIPTION >

Electric Throttle Control Actuator

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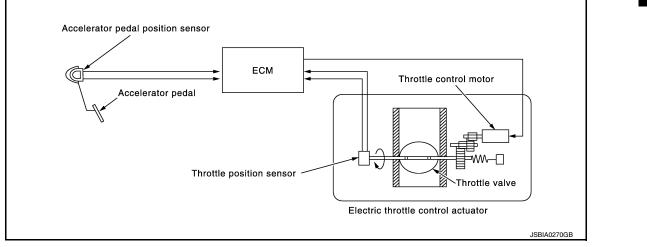
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OUTLINE

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



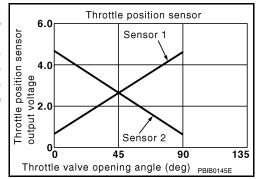
THROTTLE CONTROL MOTOR

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 ^H 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.



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 aujetness.

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 valve and reduces vibrations generated during driving.

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< 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	2.37 - 2.63
50 (122)	2.2	0.68 - 1.00
90 (194)	0.9	0.236 - 0.260

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

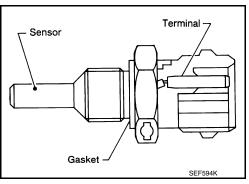
Engine Oil Pressure Sensor

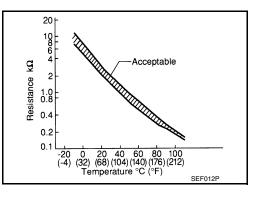
The engine oil pressure (EOP) sensor is detects engine oil pressure and transmits a voltage signal to the ECM.

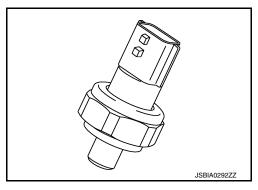
Engine Oil Temperature Sensor

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.

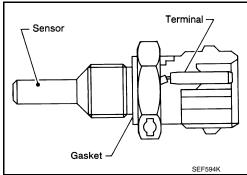








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< SYSTEM DESCRIPTION >

<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.

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-46, "EVAPORATIVE EMISSION SYSTEM : 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.

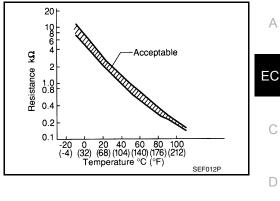
This solenoid valve responds to signals from the ECM. When the ECM sends an ON signal, the coil in the solenoid valve is energized. A plunger will then move to seal the canister vent. The ability to seal the vent is necessary for the on board diagnosis of other evaporative emission control system components.

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

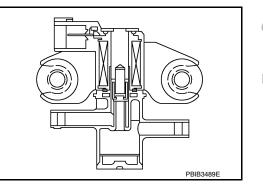
The EVAP control system pressure sensor detects pressure in the purge line. The sensor output voltage to the ECM increases as pressure increases.



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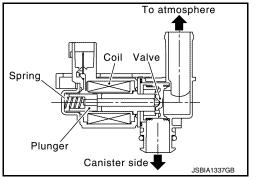
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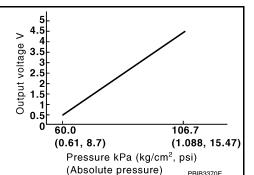
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< SYSTEM DESCRIPTION >

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.

Fuel Level Sensor Unit and Fuel Pump (With Fuel Tank Temperature Sensor)

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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 an 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 sends the control signal to the fuel pump control module, which in turn controls the fuel pump.

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

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 voltage 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

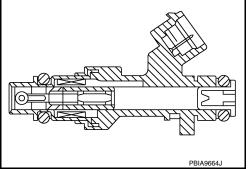
*: These data are reference values and are measured between ECM terminals 95 (Fuel tank temperature sensor) and ground.

Heated Oxygen Sensor 2

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10 8 6 Acceptable Å Resistance 1.0 0.4 02 0.1 0 20 40 60 80 100 (32) (68) (104) (140) (176) (212) (-4)Temperature °C (°F) SEE012P

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DESCRIPTION

< SYSTEM 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

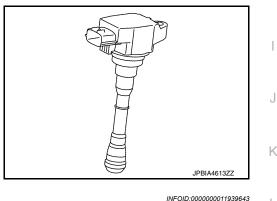
Heated oxygen sensor 2 heater is integrated in the sensor.

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	F
 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	-

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.



Intake Valve Timing Control Solenoid Valve

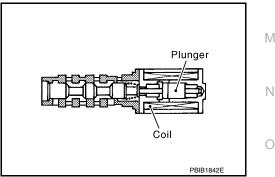
Intake valve timing control solenoid valve is activated by ON/OFF pulse duty (ratio) signals from the ECM.

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.





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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.

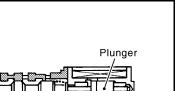
When ON and OFF pulse widths become equal, the solenoid valve stops oil pressure flow to fix the exhaust valve angle at the control position.

Knock Sensor

The knock sensor is attached to the cylinder block. It senses engine knocking using a piezoelectric element. A knocking vibration from the cylinder block is sensed as vibrational pressure. This pressure is converted into a voltage signal and sent to the ECM.

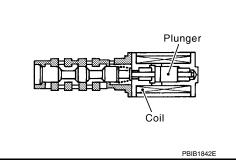
Revision: October 2015

EC-28

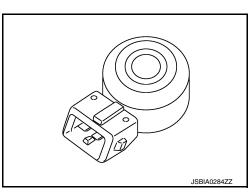


Coil

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Malfunction Indicator Lamp (MIL)

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.

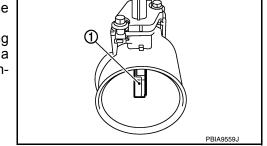
For details, refer to <u>EC-70</u>, "<u>DIAGNOSIS DESCRIPTION</u> : <u>Malfunc-</u> tion Indicator Lamp (<u>MIL</u>)".

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 heater in sensing element to a certain amount.

The temperature distribution around the heater changes according to the increase in intake air volume. The change is detected by a thermistor and the air volume data is sent to ECM by the MAF sensor.



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.

<Reference data>

Intake air temperature [°C (°F)]	Voltage [*] (V)
25 (77)	1.9 – 2.1
80 (176)	3.2 – 3.4

*: These data are reference values on the diagnosis tool.

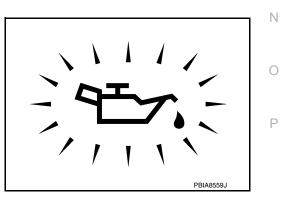
Oil Pressure Warning Lamp

Oil pressure warning lamp is located on the combination meter. It indicates the low pressure of the engine oil and the malfunction of the engine oil pressure system.

Combination meter turns the oil pressure warning lamp ON/OFF according to the oil pressure warning lamp signal received from ECM via CAN communication.

For details, refer to <u>EC-50, "ENGINE PROTECTION CONTROL AT</u> LOW ENGINE OIL PRESSURE : System Description".

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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.

Connector portion S voltage (Signal processing portion (electric circuit) Output Pressure detecting portion 0.20 134 (1.34, 1.4, 20) 0 Pressure

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
Depressed	OFF	ON

VIAS Control Solenoid Valve 1 and 2

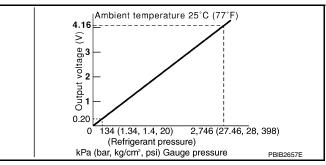
The VIAS control solenoid valve cuts the intake manifold vacuum signal for power valve control. It responds to ON/OFF signals from the ECM. When the solenoid is OFF, the vacuum signal from the intake manifold is cut. When the ECM sends an ON signal the coil pulls the plunger downward and sends the vacuum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

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.

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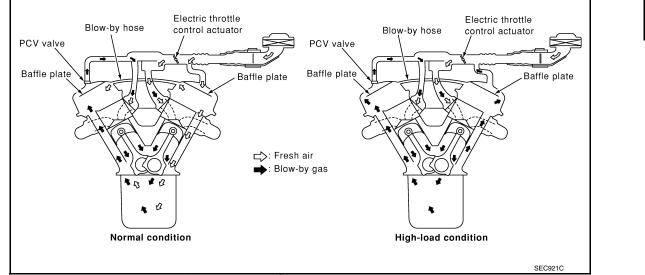
< SYSTEM DESCRIPTION >

Power Valve Actuator 1 and 2

< SYSTEM DESCRIPTION >

STRUCTURE AND OPERATION

Positive Crankcase Ventilation (PCV)



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

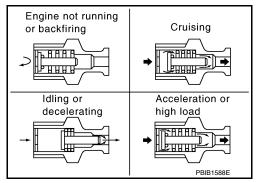
The positive crankcase ventilation (PCV) valve is provided to conduct crankcase blow-by gas to the intake manifold.

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.



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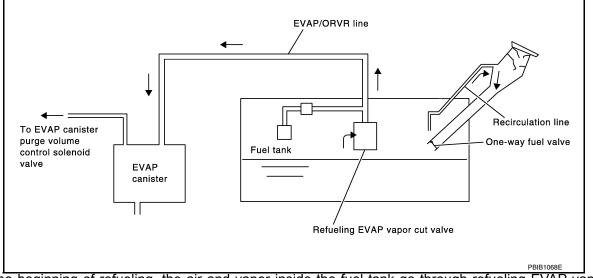
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STRUCTURE AND OPERATION

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On Board Refueling Vapor Recovery (ORVR)



From the beginning of refueling, the air and vapor inside the fuel tank go through refueling EVAP vapor cut valve and EVAP/ORVR line to the EVAP canister. The vapor is absorbed by the EVAP canister and the air is released to the atmosphere.

When the refueling has reached the full level of the fuel tank, the refueling EVAP vapor cut valve is closed and refueling is stopped because of auto shut-off. The vapor which was absorbed by the EVAP canister is purged during driving.

WARNING:

When conducting inspections below, be sure to observe the following:

- Put a "CAUTION: FLAMMABLE" sign in workshop.
- Never smoke while servicing fuel system. Keep open flames and sparks away from work area.
- Always to furnish the workshop with a CO₂ fire extinguisher.

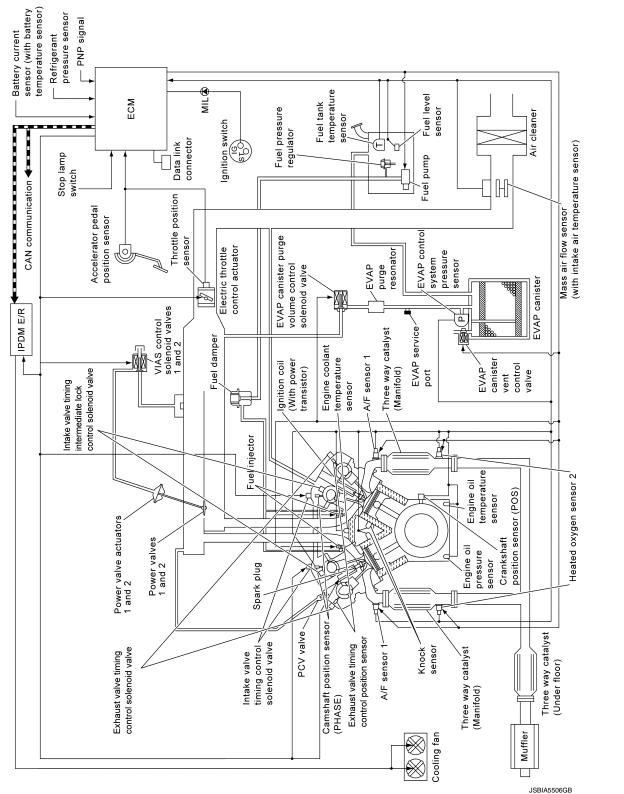
CAUTION:

- Before removing fuel line parts, carry out the following procedures:
- Put drained fuel in an explosion-proof container and put lid on securely.
- Release fuel pressure from fuel line. Refer to EC-168, "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.

SYSTEM ENGINE CONTROL SYSTEM

ENGINE CONTROL SYSTEM : System Description

SYSTEM DIAGRAM



SYSTEM DESCRIPTION

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< SYSTEM DESCRIPTION >

ECM controls the engine by various functions.

Function	Reference
Multiport fuel injection system	EC-37. "MULTIPORT FUEL INJECTION SYSTEM : System De- scription"
Electric ignition system	EC-39. "ELECTRIC IGNITION SYSTEM : System Description"
Air conditioning cut control	EC-40. "AIR CONDITIONING CUT CONTROL : System Descrip- tion"
Automatic speed control device (ASCD)	EC-41, "AUTOMATIC SPEED CONTROL DEVICE (ASCD) : Sys- tem Description"
Cooling fan control	EC-42, "COOLING FAN CONTROL : System Description"
Electronic controlled engine mount	EC-43. "ELECTRONIC CONTROLLED ENGINE MOUNT : Sys- tem Description"
Evaporative emission system	EC-46, "EVAPORATIVE EMISSION SYSTEM : System Descrip- tion"
Throttle control	EC-47, "THROTTLE CONTROL : System Description"
Intake valve timing control	EC-47, "INTAKE VALVE TIMING CONTROL : System Description"
Exhaust valve timing control	EC-50. "EXHAUST VALVE TIMING CONTROL : System Descrip- tion"
Engine protection control at low engine oil pressure	EC-50. "ENGINE PROTECTION CONTROL AT LOW ENGINE. OIL PRESSURE : System Description"
Fuel filler cap warning system	EC-51, "FUEL FILLER CAP WARNING SYSTEM : System De- scription"
Variable induction air system	EC-52, "VARIABLE INDUCTION AIR SYSTEM : System Descrip- tion"
Integrated control of engine, CVT, and ABS	EC-54, "INTEGRATED CONTROL OF ENGINE, CVT, AND ABS : System Description"
CAN communication	EC-55. "CAN COMMUNICATION : System Description"

ENGINE CONTROL SYSTEM : Fail-safe

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NON DTC RELATED ITEM

Engine operating condi- tion in fail-safe mode	Detected items	Remarks	Reference page
Engine speed will not rise more than 2,500 rpm due to the fuel cut	Malfunction indicator lamp circuit	When there is an open circuit on MIL circuit, the ECM cannot warn the driver by illuminating MIL when there is malfunction on engine control system. Therefore, when electrical controlled throttle and part of ECM related diagnoses are continuously detected as NG for 5 trips, ECM warns the driver that engine control system malfunctions and MIL circuit is open by means of operating the fail-safe function. The fail-safe function also operates when above diagnoses except MIL circuit are detected and demands the driver to repair the malfunction.	<u>EC-561</u>

DTC RELATED ITEM

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. ECM activates the IVT intermediate lock control solenoid valve to bring the cam sprocket into an intermediate lock condition.
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.

SYSTEM

< SYSTEM DESCRIPTION >

DTC No.	Detected items	Engine operating condition in fail-safe mode	
P0101 P0102 P0103	Mass air flow sensor circuit	Engine speed will not rise more than 2,400 rpm due to the fuel cut.	
P0117 P0118	Engine coolant tempera- ture sensor circuit	Engine coolant temperature will be determined by ECM based on the following condition. CONSULT displays the engine coolant 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.	
P0524	Engine oil pressure	 ECM illuminates oil pressure warning lamp on the combination meter. Engine speed will not rise more than 4,000 rpm due to the fuel cut. Fail-safe is canceled when ignition switch OFF → ON. 	
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 Exhaust valve timing control solenoid valve Intake manifold runner control 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 Exhaust valve timing control solenoid valve Intake manifold runner control valve ASCD operation may be deactivated. 	

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< SYSTEM DESCRIPTION >

DTC No.	Detected items	Engine operating condition in fail-safe mode		
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 Exhaust valve timing control solenoid valve Intake manifold runner control valve Engine torque may be limited. ASCD operation may be deactivated. 		
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 Exhaust valve timing control solenoid valve Intake manifold runner control 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	
		When engine is idling	Normal	
		When accelerating	Poor acceleration	
P2100 P2103	Throttle control motor relay	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.		
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.		
P2119	Electric throttle control ac- tuator	(When electric throttle control actuator does not function properly due to the return spring malfunction:) ECM controls the electric throttle actuator by regulating the throttle opening around the idle position. The engine speed will not rise more than 2,000 rpm.		
		(When throttle valve opening angle in fail-safe mode is not in specified range:) ECM controls the electric throttle control actuator by regulating the throttle opening to 20 degrees or less.		
		(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 or more.		
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.		

MULTIPORT FUEL INJECTION SYSTEM

< SYSTEM DESCRIPTION >

MULTIPORT FUEL INJECTION SYSTEM : System Description

SYSTEM DIAGRAM

Crankshaft position sensor (POS)	Distances			
Camshaft position sensor (PHASE)	Piston position			
Mass air flow sensor	Amount of intake air			
Intake air temperature sensor	Intake air temperature			
Engine coolant temperature sensor	Engine coolant temperature			
Air fuel ratio (A/F) sensor 1	Density of oxygen in exhaust gas			
Throttle position sensor	Throttle position		Fuel injection	
Accelerator pedal position sensor	Accelerator pedal position		& mixture ratio	[]
Battery	Battery voltage*1	ECM		 Fuel injector
Knock sensor	Engine knocking condition			
Heated oxygen sensor*2	Density of oxygen in exhaust gas • VDC operation signal			
BS actuator and electric unit (control unit)	• VDC operation signal • TCS operation signal			
Power steering control module	EPS operation signal			
Combination meter	Vehicle speed signal			
A/C auto amp.	∙A/C ON signal •Blower fan ON signal			
TCM	Shift position signal			

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

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

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

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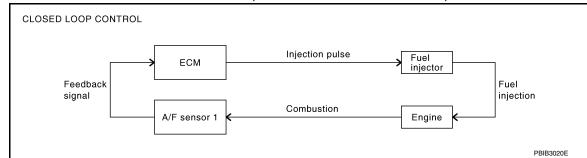
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MIXTURE RATIO FEEDBACK CONTROL (CLOSED LOOP CONTROL)



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 <u>EC-20</u>, "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 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.



< SYSTEM DESCRIPTION >

FUEL INJECTION TIMING

 Sequential multiport fuel injection system 	 Simultaneous multiport fuel injection system 	A
No. 1 cylinder No. 2 cylinder No. 3 cylinder No. 4 cylinder No. 5 cylinder No. 6 cylinder	No. 1 cylinder No. 2 cylinder No. 3 cylinder No. 4 cylinder No. 5 cylinder No. 6 cylinder SEF179U	EC

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.

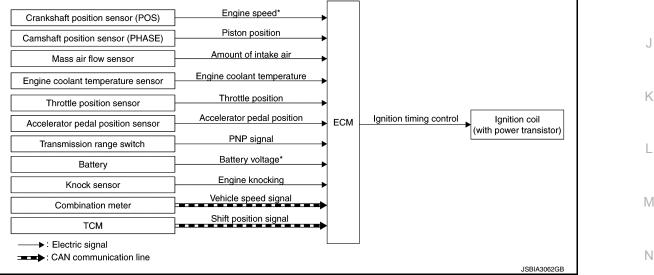
FUEL SHUT-OFF

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

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

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INFOID:000000011939660

< SYSTEM DESCRIPTION >

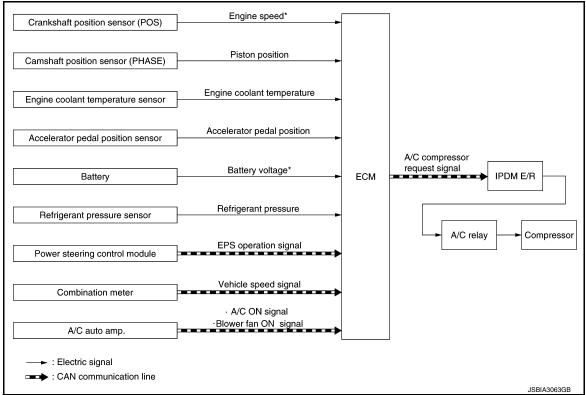
During acceleration

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

INFOID:000000011939661

SYSTEM DIAGRAM



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

SYSTEM DESCRIPTION

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

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

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

AUTOMATIC SPEED CONTROL DEVICE (ASCD)

< SYSTEM DESCRIPTION >

AUTOMATIC SPEED CONTROL DEVICE (ASCD) : System Description

INFOID:000000011939662

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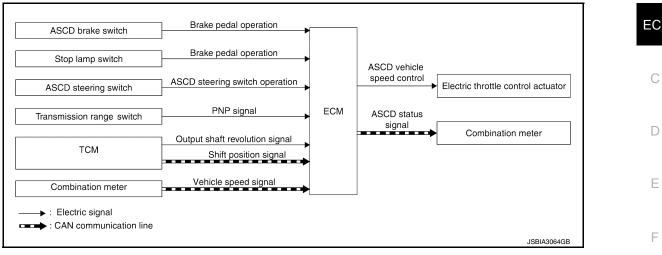
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IVQ35DE

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 indicator and SET indicator in 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 indicator in combination meter illuminates.) When vehicle speed reaches a desired speed between approximately 40 km/h (25 MPH) and 144 km/h (89 MPH), press SET/COAST switch. (Then SET lamp in combination meter illuminates.)

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 at ASCD steering switch are pressed at the same time. (Set speed will be cleared.)
- Brake pedal is depressed.
- Selector lever is in the N, P, and R positions.
- · Vehicle speed decreased to 13 km/h (8 MPH) lower than the set speed.
- TCS system is operated.

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

- Engine coolant temperature is slightly higher than the normal operating temperature, CRUISE lamp may blink slowly.
- When the engine coolant temperature decreases to the normal operating temperature, CRUISE lamp will stop blinking and the cruise operation will be able to work by pressing SET/COAST switch or RESUME/ ACCELERATE switch.

• Malfunction for some self-diagnoses regarding ASCD control: SET indicator will blink quickly.

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

COAST OPERATION

< SYSTEM DESCRIPTION >

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

RESUME OPERATION

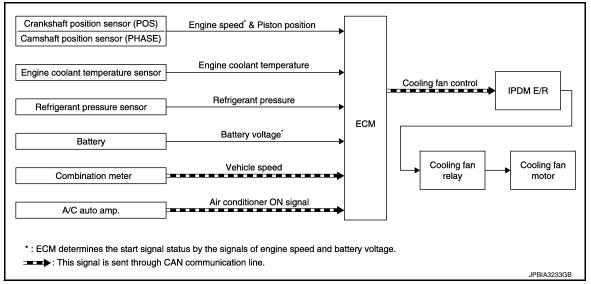
When the RESUME/ACCELERATE switch is pressed after cancel operation other than pressing MAIN switch is performed, vehicle speed will return to last set speed. To resume vehicle set speed, vehicle condition must meet following conditions.

- Brake pedal is released
- Selector lever is in the P and N positions
- 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

INFOID:000000011939663

SYSTEM DIAGRAM



SYSTEM DESCRIPTION

ECM controls cooling fan speed corresponding to vehicle speed, engine coolant temperature, refrigerant pressure, air conditioner ON signal. Then control system has 4-step control [HIGH/MIDDLE/LOW/OFF].

< SYSTEM DESCRIPTION >

Cooling Fan Operation A/C switch ON (blower fan operating) Refrigerant pressure: A/C switch OFF 12.8 kPa (12.8 bar, 13.05 kg/cm², 185.6 psi) or less Engine coolant temperature , ∪ 0100 (212) 98 (208) Engine coolant temperature <u>0</u>100 (212) 98 (208) 80 80 (50) (50)Vehicle speed km/h (MPH) Vehicle speed km/h (MPH) A/C switch ON (blower fan operating) A/C switch ON (blower fan operating) Refrigerant pressure: Refrigerant pressure: Between 12.8 kPa (12.8 bar, 13.05 kg/cm², 185.6 psi) more than 1.58 kPa (15.8 bar, 16.11 kg/cm², 229.1 psi) Engine coolant temperature and 1.58 kPa (15.8 bar, 16.11 kg/cm², 229.1 psi) í Engine coolant temperature (⊥) ∪ ∪ 00 (212) 08 (208) 0 0 100 (212) 98 (208) 98 (208) 80 80 (50) (50) Vehicle speed km/h (MPH) Vehicle speed km/h (MPH) : Cooling fans 2: Cooling fans operate S: Cooling fans operate it cooling fans operate at Middle speed. do not operate. at Low speed. at High speed. JSBIA3475GB

Cooling Fan Relay Operation

The ECM controls cooling fan relays through CAN communication line.

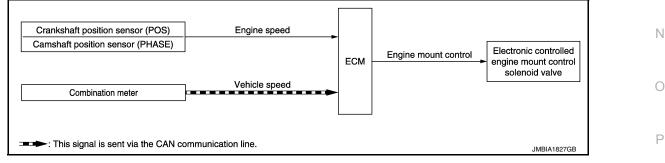
Cooling for crood		Cooling fan relay		
Cooling fan speed	1	2	3	
Stop (OFF)	OFF	OFF	OFF	•
Low (LOW)	ON	OFF	OFF	-
Middle (MID)	OFF	ON	OFF	ŀ
High (HI)	OFF	ON	ON	-

ELECTRONIC CONTROLLED ENGINE MOUNT

ELECTRONIC CONTROLLED ENGINE MOUNT : System Description

INFOID:0000000011939664

SYSTEM DIAGRAM



SYSTEM DESCRIPTION

Revision: October 2015

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

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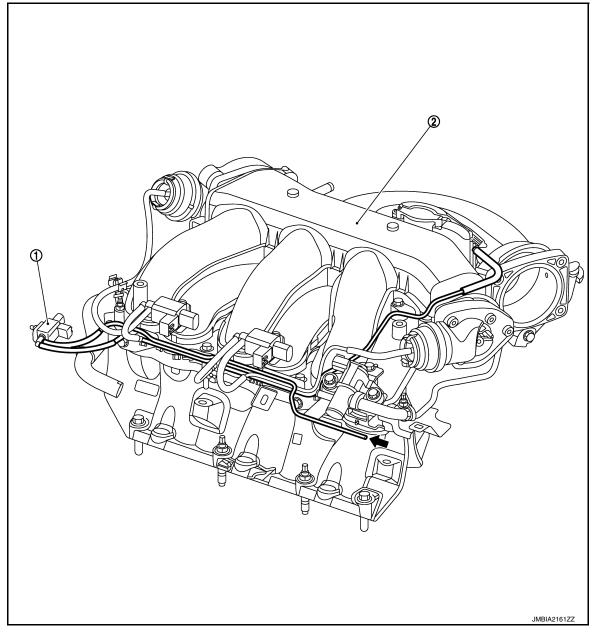
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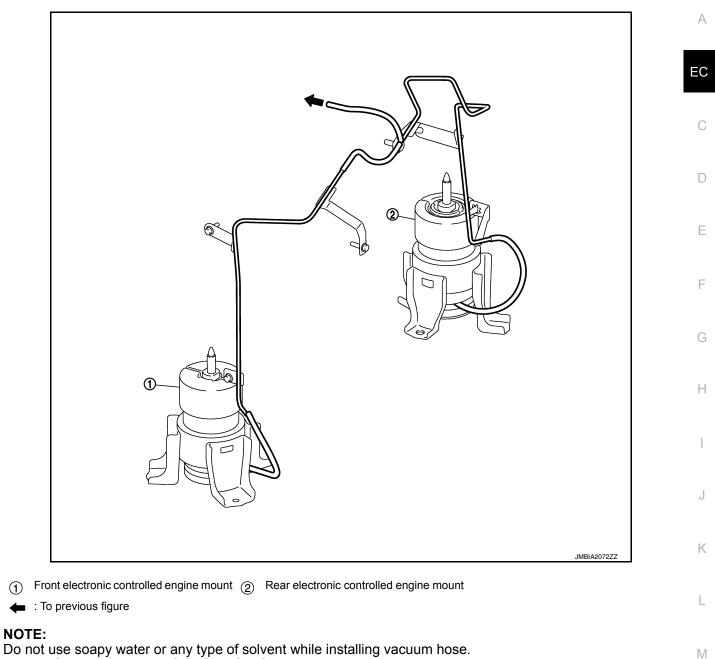
< SYSTEM DESCRIPTION >

Vehicle condition	Engine mount control
Engine speed: Below 950 rpm	Soft
Engine speed: Above 950 rpm	Hard

ELECTRONIC CONTROLLED ENGINE MOUNT LINE DRAWING



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



EVAPORATIVE EMISSION SYSTEM

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< SYSTEM DESCRIPTION >

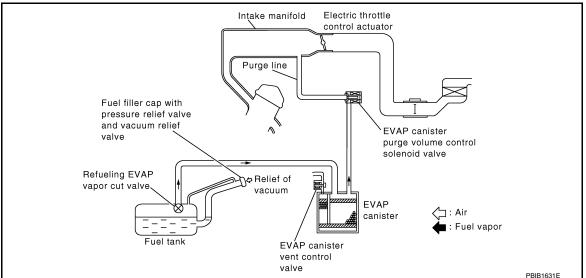
EVAPORATIVE EMISSION SYSTEM : System Description

[VQ35DE]

SYSTEM DIAGRAM

Crankshaft position sensor	Engine speed & Piston position	_	
Camshaft position sensor			
Mass air flow sensor	Amount of intake air	-	
Engine coolant temperature sensor	Engine coolant temperature	•	
Air fuel ratio (A/F) sensor 1	Density of oxygen in exhaust gas	•	
Throttle position sensor	Throttle position	- ECM	EVAP canister purge flow control EVAP canister purge volume
Accelerator pedal position sensor	Accelerator pedal position		control solenoi valve
Battery	Battery voltage*	-	
Fuel tank temperature sensor	Fuel temperature in fuel tank	•	
EVAP control system pressure sensor	Pressure in purge line	*	
Combination meter	Vehicle speed	•	

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.

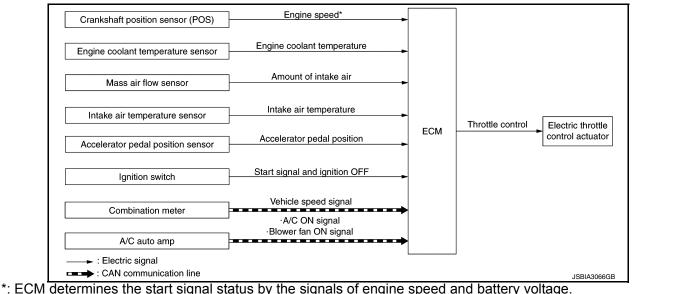
EVAP canister purge volume control solenoid valve also shuts off the vapor purge line during decelerating and idling.

THROTTLE CONTROL

< SYSTEM DESCRIPTION >

THROTTLE CONTROL : System Description

SYSTEM DIAGRAM





ECM calculates the value of signal transmitted from the accelerator pedal and activates the throttle valve by transmitting a control signal to the electric throttle control actuator. This allows the optimum throttle angle and improves drivability and fuel consumption. In addition, ECM learns the fully closed position every time when the ignition switch is turned OFF to improve the accuracy in throttle valve position.

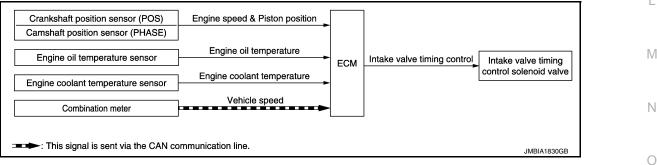
When a malfunction occurs in the throttle control system, the throttle valve is closed by the return spring and maintains the minimum engine speed by holding a slightly opened condition which is close to the fully opened condition. This allows the securing of brake system, power steering system, and electric system and the ensuring of the safety.

INTAKE VALVE TIMING CONTROL

INTAKE VALVE TIMING CONTROL : System Description

INTAKE VALVE TIMING CONTROL

System Diagram



[VQ35DE]

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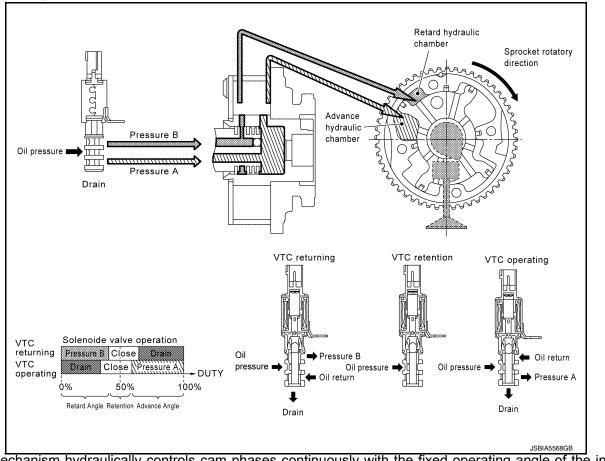
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INFOID:000000011939667

< SYSTEM DESCRIPTION >



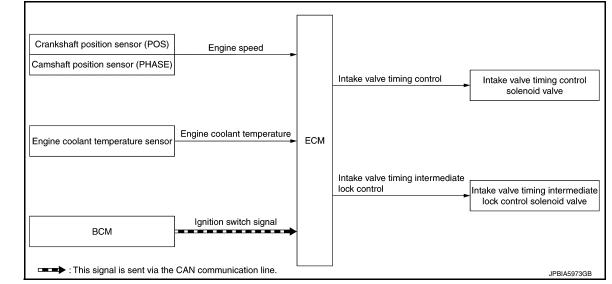


This mechanism hydraulically controls cam phases continuously with the fixed operating angle of the intake valve.

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

INTAKE VALVE TIMING INTERMEDIATE LOCK CONTROL

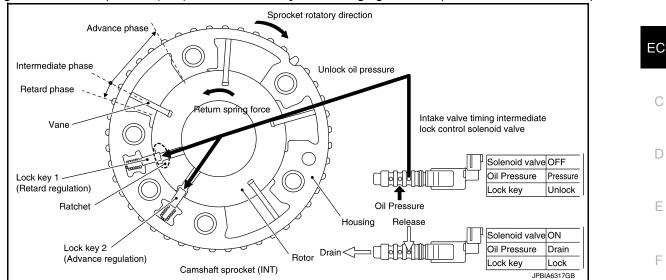
System Diagram



System Description

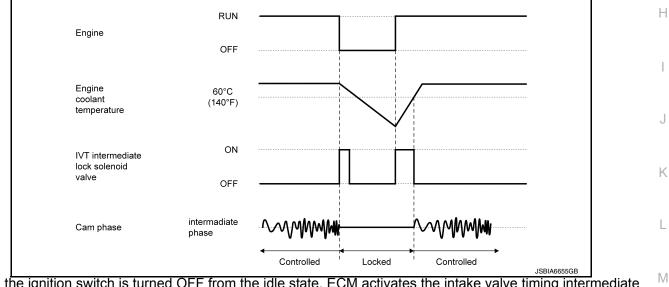
< SYSTEM DESCRIPTION >

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 keys and bringing the cam phase into intermediate phase.



Cam phase is fixed at the intermediate phase by two lock keys 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 key and locking/unlocking the lock key.

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 key 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

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[VQ35DE]

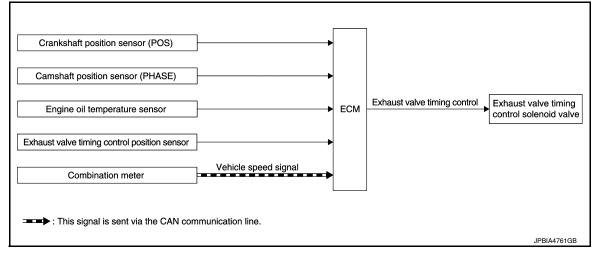
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< SYSTEM DESCRIPTION >

EXHAUST VALVE TIMING CONTROL : System Description

[VQ35DE]

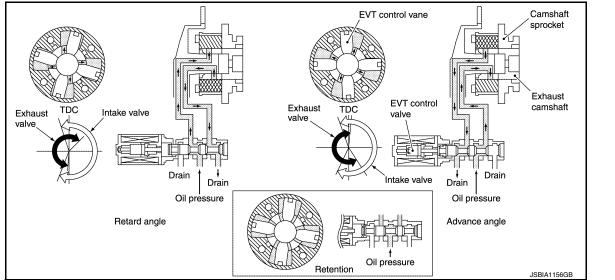
SYSTEM DIAGRAM



INPUT/OUTPUT SIGNAL CHART

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

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.

ENGINE PROTECTION CONTROL AT LOW ENGINE OIL PRESSURE

ENGINE PROTECTION CONTROL AT LOW ENGINE OIL PRESSURE : System De-

< SYSTEM DESCRIPTION >

scription

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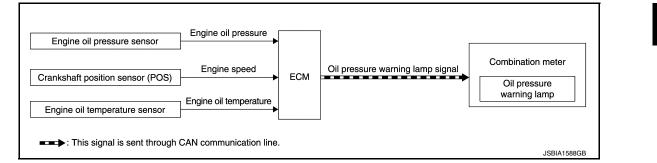
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SYSTEM DIAGRAM



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.
- 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	ŀ
		Oil pressure warning lamp	Fuercut	
Detection	Less than 1,000 rpm	ON*	NO	
	1,000 rpm or more	ON	YES	

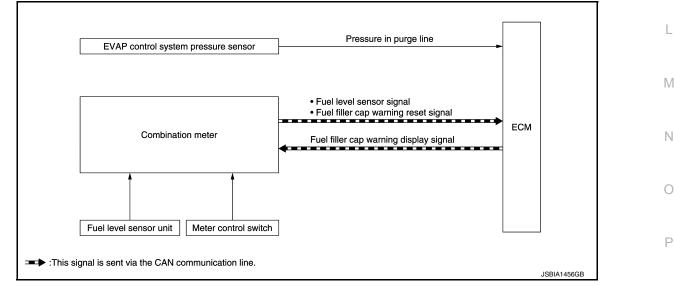
*: When detecting a normal engine oil pressure, ECM turns OFF the oil pressure warning lamp. FUEL FILLER CAP WARNING SYSTEM

FUEL FILLER CAP WARNING SYSTEM : System Description

INFOID:000000011939670

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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.

Revision: October 2015

< SYSTEM DESCRIPTION >

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.

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:000000011939675

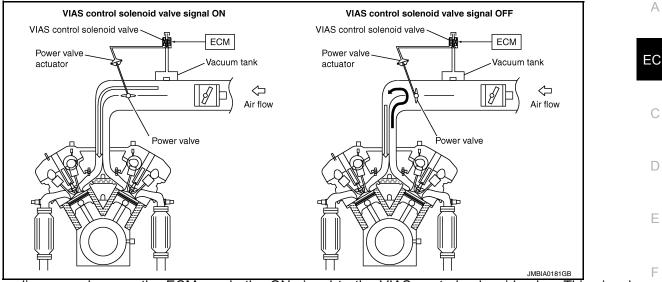
SYSTEM DIAGRAM

Crankshaft position sensor (POS)	Engine speed*		
Camshaft position sensor (PHASE)			
Mass air flow sensor	Amount of intake air	-	
Engine coolant temperature sensor	Engine coolant temperature	-	
Throttle position sensor	Throttle position	ECM	VIAS control VIAS control solenoid valve 1 and 2
Accelerator pedal position sensor	Accelerator pedal position	-	
Battery	Battery voltage*	-	
* : ECM determines the start signal sta	tus by the signals of engine sp	eed and b	attery voltage.
			JMBIA1831GB



< SYSTEM DESCRIPTION >

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.

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 H 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.

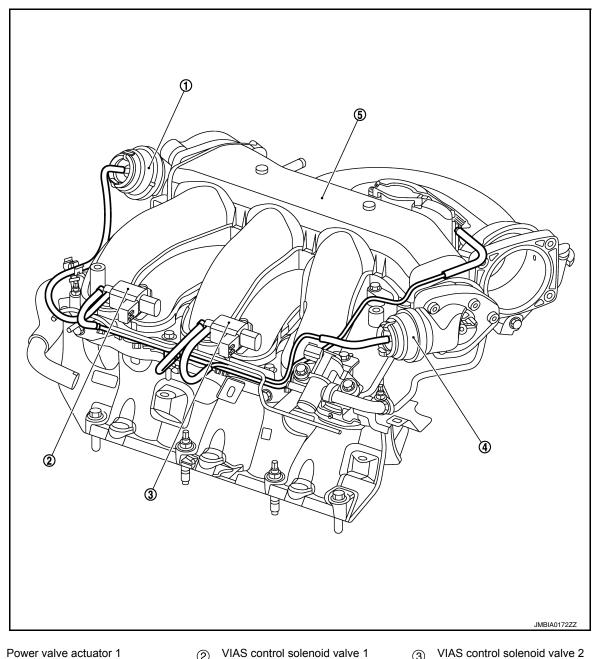
VACUUM HOSE DRAWING

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- Power valve actuator 1 (\mathbf{f})
- VIAS control solenoid valve 1

VIAS control solenoid valve 2

- Power valve actuator 2 (4)
- (5) Intake manifold collector

INTEGRATED CONTROL OF ENGINE, CVT, AND ABS

INTEGRATED CONTROL OF ENGINE, CVT, AND ABS : System Description

INFOID:000000011939676

Real time communications (signal exchange) among control units (e.g. ECM, CVT, ABS, and combination meter) via CAN communication optimizes engine torque and lock-up during gear shift and prevents engine speed from decreasing during deceleration.

ALTERNATOR POWER GENERATION VOLTAGE VARIABLE CONTROL SYS-TEM

ALTERNATOR POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM :

< SYSTEM DESCRIPTION >

System Description

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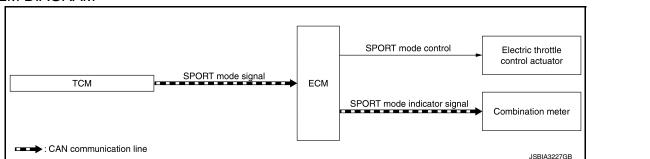
INFOID:000000012460033

The alternator power generation voltage variable control system controls the amount of power generation, according to a battery loaded condition. ECM judges a battery condition, according to a signal received from the battery current sensor which detects a charge/discharge current. ECM then transmits a signal to IPDM E/R to command power generation via CAN communication. IPDM E/R transmits a power generation control signal to the alternator so that the system can control the amount of power generation. The voltage of power generation is lowered during battery low-load conditions and boosted under heavy load conditions. In this way, the system reduces the engine load through the adequate power generation control. For details, refer to <u>CHG-7. "POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM : System Description"</u>.

SPORT MODE CONTROL

SPORT MODE CONTROL : System Description

SYSTEM DIAGRAM



SYSTEM DESCRIPTION

- SPORT mode that keeps high engine revolution and provides direct feel and acceleration performance suitable for driving on winding road.
- ECM receives drive mode signal (SPORT/NORMAL) from TCM via CAN communication and improves drivability by controlling the throttle movement.
- ECM transmits SPORT mode indicator lamp signal to the combination meter via CAN communication. **NOTE:**

For the details of the SPORT mode, refer to <u>DMS-7. "DRIVE MODE SELECTOR : System Description"</u>. 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 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. WARNING LAMPS/INDICATOR LAMPS WARNING LAMPS/INDICATOR LAMPS : Engine Oil Pressure Warning Lamp

INFOID:000000012458842

INFOID:0000000011939677

DESIGN/PURPOSE

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< SYSTEM DESCRIPTION >

When engine oil pressure is low, the oil pressure warning lamp informs the driver of low oil pressure to prevent damage to the engine.



BULB CHECK

Not applicable

OPERATION AT COMBINATION METER CAN COMMUNICATION CUT-OFF OR UNUSUAL SIGNAL

For the operation for CAN communications blackout or abnormal signal reception, refer to <u>MWI-28, "Fail-safe"</u>.

SYSTEM DIAGRAM

Engine oil pressure sensor	Engine oil pressure signal	ECM	Engine oil pressure warning signal	Combination meter Oil pressure warning
■■■● : CAN comn	nunication line			JSBIA3494GB

SIGNAL PATH

ECM calculates an engine oil pressure according to a signal transmitted from the engine oil pressure sensor. When the engine oil pressure is low, ECM transmits the engine oil pressure warning lamp signal to combination meter via CAN communication. Then the engine oil pressure warning lamp illuminates.

LIGHTING CONDITION

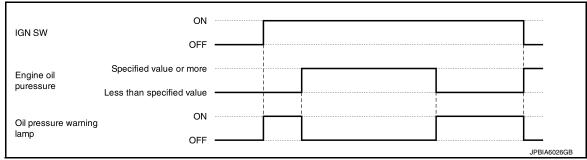
When any of the following conditions is satisfied:

- · Ignition switch: OFF
- Engine oil pressure is the specified value or more.

SHUTOFF CONDITION

- When any of the following conditions is satisfied:
- Ignition switch: OFF
- Engine oil pressure is the specified value or more.

TIMING CHART



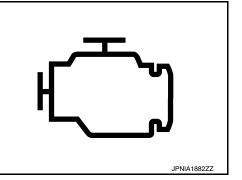
< SYSTEM DESCRIPTION >

WARNING LAMPS/INDICATOR LAMPS : Malfunction Indicator Lamp (MIL)

DESIGN/PURPOSE

When a malfunction which increases exhaust gases is detected, ECM turns ON MIL and informs the driver of the necessity of inspection and repair.

When a malfunction which causes damage to the catalyst is detected, ECM immediately blinks MIL to alert the driver.



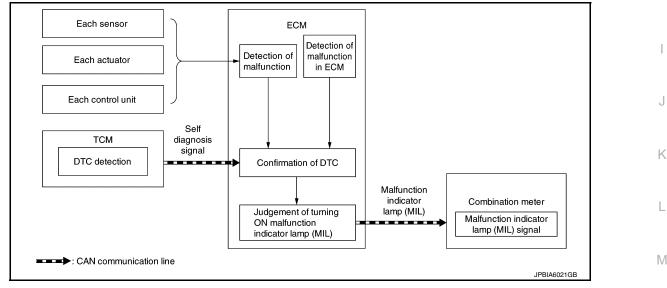
BULB CHECK

The bulb turns ON after turning ON the ignition switch (engine stop) and turns OFF after restarting the engine.

OPERATION AT COMBINATION METER CAN COMMUNICATION CUT-OFF OR UNUSUAL SIG-NAL

For the operation for CAN communication blackout in the combination meter, refer to MWI-28, "Fail-safe".

SYSTEM DIAGRAM



SIGNAL PATH

- When the lighting conditions of the malfunction indicator lamp (MIL) are satisfied, ECM transmits a malfunc- N tion indicator lamp (MIL) signal to the combination meter via CAN communication.
- The combination meter turns ON or blinks the malfunction indicator lamp (MIL), according to a signal received from ECM.

LIGHTING CONDITION

When all of the following conditions are satisfied:

- Ignition switch: ON
- DTC which influences on exhaust gasses is judged.

For DTCs that the malfunction indicator lamp turns ON and the number of DTC diagnosis trips, refer to <u>EC-107, "DTC Index"</u>.

SHUTOFF CONDITION

When any of the following conditions is satisfied:

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INFOID:000000012444638



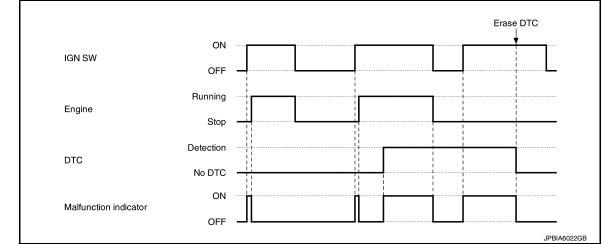
Ρ

< SYSTEM DESCRIPTION >

Ignition switch: OFF

Erase DTC

TIMING CHART



INFORMATION DISPLAY (COMBINATION METER)

INFORMATION DISPLAY (COMBINATION METER) : ASCD Indicator

INFOID:000000012444606

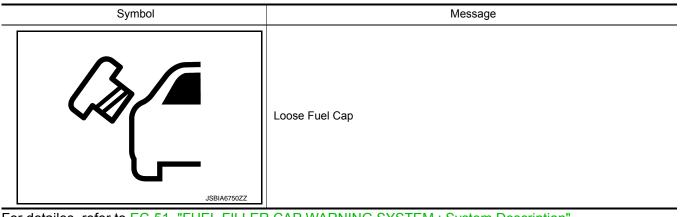
Item	Symbol	Function
ASCD indicator	JSCIA0831ZZ Message: Km/h / MPH	For detail of ASCD function, refer to <u>EC-60. "AUTO-MATIC SPEED CONTROL DEVICE (ASCD) :</u> Switch Name and Function".

INFORMATION DISPLAY (COMBINATION METER) : Fuel Filler Cap Warning

INFOID:000000011939674

DESIGN/PURPOSE

Warn the driver that the fuel filler cap is left opened.



For detailes, refer to EC-51, "FUEL FILLER CAP WARNING SYSTEM : System Description".

< SYSTEM DESCRIPTION >

WARNING/INDICATOR/CHIME LIST

WARNING/INDICATOR/CHIME LIST : Warning lamps/Indicator lamps

INFOID:000000012444608

[VQ35DE]

			EC
Name	Design	Arrangement/Function	
Oil pressure warning lamp		Regarding the arrangement. Refer to <u>MWI-6, "METER SYSTEM : De-sign"</u> .	С
	1_71	Regarding the function. Refer to <u>EC-55</u> , "WARNING LAMPS/INDICA- <u>TOR LAMPS : Engine Oil Pressure Warning Lamp"</u> .	
Malfunction indicator lamp (MIL)		Regarding the arrangement. Refer to <u>MWI-6, "METER SYSTEM : De-</u> sign".	D
	الـا	Regarding the function. Refer to EC-57, "WARNING LAMPS/INDICA- TOR LAMPS : Malfunction Indicator Lamp (MIL)".	E

WARNING/INDICATOR/CHIME LIST : Warning/Indicator (On Information Display)

INFOID:000000012444609

Name	Function	
ASCD indicator	Refer to EC-58, "INFORMATION DISPLAY (COMBINATION METER) : ASCD Indicator".	G
Fuel filler cap warning	Refer to EC-58, "INFORMATION DISPLAY (COMBINATION METER) : Fuel Filler Cap Warning".	Н

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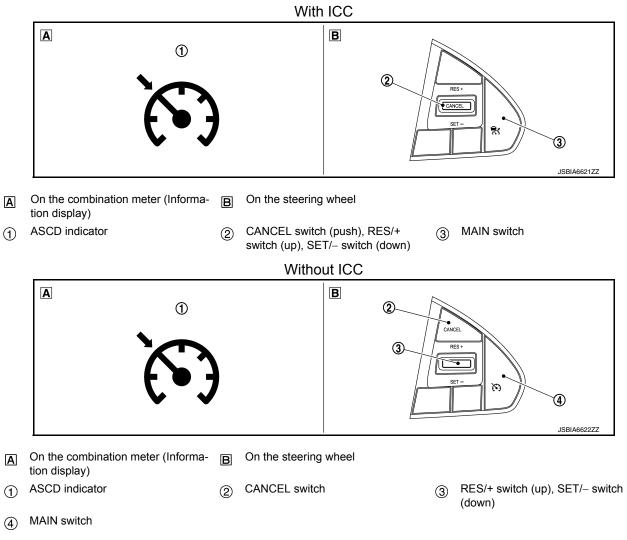
Ρ

OPERATION AUTOMATIC SPEED CONTROL DEVICE (ASCD)

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

INFOID:0000000011939679

SWITCHES AND INDICATORS



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.
MAIN switch	Master switch to activate the ASCD system.

OPERATION

< SYSTEM DESCRIPTION >

CANCEL OPERATION А When any of following conditions exist, cruise operation will be canceled. CANCEL switch is pressed MAIN switch pressed (Set speed is cleared) More than 2 switches at ASCD steering switch are pressed at the same time (Set speed will be cleared) EC Brake pedal is depressed Selector lever position is changed to N, P or R Vehicle speed decreased to 13 km/h (8 MPH) lower than the set speed TCS system is operated When the ECM detects any of the following conditions, the ECM will cancel the cruise operation and inform the driver by blinking indicator. Engine coolant temperature is slightly higher than the normal operating temperature, CRUISE indicator may D blink slowly. When the engine coolant temperature decreases to the normal operating temperature, CRUISE indicator will stop blinking and the cruise operation will be able to work by pressing SET/- switch or RES/+ switch. Е Malfunction for some self-diagnoses regarding ASCD control: SET indicator will blink quickly. If MAIN switch is turned to OFF during ASCD is activated, all of ASCD operations will be canceled and vehicle speed memory will be erased. F Н Κ L Μ Ν Ο Ρ

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:000000011939681

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:000000011939680

[VQ35DE]

< SYSTEM DESCRIPTION >

А

DIAGNOSIS SYSTEM (ECM) DIAGNOSIS DESCRIPTION

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

EC INFOID:000000011939682

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	2nc	l trip	1st trip	2nd trip	1st trip	2nd trip	
Nome	Blinking	Illuminat- ed	Blinking	Illuminat- ed	displaying	displaying	displaying	display- ing	F
Misfire (Possible three way catalyst damage) — DTC: P0300 – P0308 is being detected	×	_	_	_	_	_	x	_	G
Misfire (Possible three way catalyst damage) — DTC: P0300 – P0308 is being detected	_	_	×	_	_	×	_	_	Н
One trip detection diagnoses (Re- fer to <u>EC-107, "DTC Index"</u> .)	_	×	_	_	×	_	_	_	
Except above	—	—	_	×	—	×	×	_	I

DIAGNOSIS DESCRIPTION : DTC and Freeze Frame Data

INFOID-000000011939683

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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-107, "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-150, "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.

< 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 – P0308 Fuel Injection System Function — DTC: P0171, P0172, P0174, P0175								
2		Except the above items								
3	1st trip freeze frame data									

For example, the EGR malfunction (Priority: 2) was detected and the freeze frame data was saved in the 2nd trip. After that when the misfire (Priority: 1) is detected in another trip, the freeze frame data will be updated from the EGR malfunction to the misfire. The 1st trip freeze frame data is updated each time a different malfunction is detected. There is no priority for 1st trip freeze frame data. However, once freeze frame data 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:000000011939684

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 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 110 ÷c 0 0 Counter DTC & DISPLAY NO DISPLAY Freeze NO DISP Data> Н Frame Data *4 3 DISPLAY DISPLAY Frame 1st trip CLEAR CLEAR Freeze Frame Freeze Data 6 DISPLAY DISPLAY 1st trip CLEAR CLEAF trip) DTC 5 & (1st *8 DTC 80 С 79 5 Counter Κ 0 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) without the same malfunction. (The stored in ECM. 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>.

< SYSTEM DESCRIPTION >

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

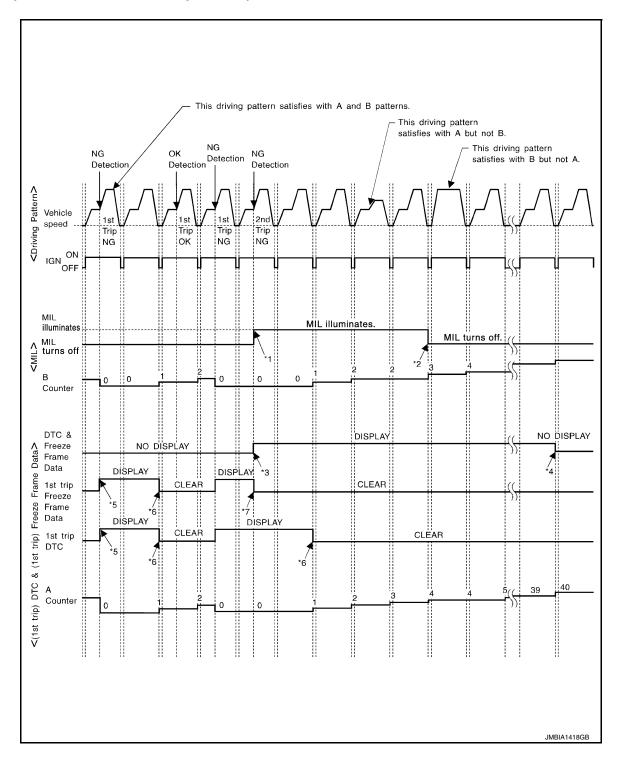
If the stored freeze frame data is as per the following:

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"



< SYSTEM DESCRIPTION >

[VQ35DE]

 *1: When the same malfunction is de-tected in two consecutive trips, MIL will turn OFF after vehicle is driv-tected in two consecutive trips, MIL will turn OFF after vehicle is driv-tected in two consecutive trips, the malfunctions. *2: MIL will turn OFF after vehicle is driv-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 will not be displayed any longer after vehicle is driven 40 times (pattern A) without the same malfunction. (The DTC and the freeze frame data still remain in ECM.) *5: When a malfunction is detected for the first time, the 1st trip DTC and the first time, the 1st trip DTC and the same malfunction. *6: 1st trip DTC will be cleared after vehicle is driven once (pattern B) without the same malfunction. *6: 1st trip DTC will be cleared after vehicle is driven once (pattern B) without the same malfunction. 	EC C												
*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 Quality Deterioration>", "Fuel Injection System"													
Driving Pattern A Refer to <u>EC-67, "DIAGNOSIS DESCRIPTION : Driving Pattern"</u> .	F												
Driving Pattern B Refer to <u>EC-67, "DIAGNOSIS DESCRIPTION : Driving Pattern"</u> .													
DIAGNOSIS DESCRIPTION : Driving Pattern	G												
CAUTION: 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. NOTE: When the same malfunction is detected regardless of driving conditions, reset the counter of driving pattern 													
 A. When the above conditions are satisfied without detecting the same malfunction, reset the counter of driving pattern A. 	K												
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 closed loop. 	M												
 Vehicle speed of 30 – 60 km/h (19 – 37 MPH) is maintained for 10 seconds or more under the control of closed loop. 	NI												
• Under the closed loop control condition, the following state reaches 12 seconds or more in total: Vehicle speed of 4 km/h (2 MPH) or less with idling condition.	Ν												
 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 	Ρ												
 B. 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) \pm 375 rpm

EC-67

< SYSTEM DESCRIPTION >

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:000000011939686

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 Κ 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".

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NOTE:

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

DIAGNOSIS DESCRIPTION : Permanent Diagnostic Trouble Code (Permanent DTC)

INFOID:000000011939687

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 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 detecting a DTC that affects exhaust gas, the exhaust emission-related control module transmits a malfunction indicator lamp signal to ECM via CAN communication line.

ECM prioritizes (MIL: ON/blink) the signal received from the exhaust emission-related control module and the ECM-stored DTC that affects exhaust gas and transmits a malfunction indicator lamp signal to the combination meter via CAN communication line.

The combination meter turns ON or blinks the MIL, according to the signal transmitted from ECM, and alerts the driver of malfunction detection.

- Control modules that a DTC of MIL ON/Blink is stored (Control module varies among DTCs.):
- ECM

- TCM

1. 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-561, "Component Function Check"</u>.

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

NOTE:

If MIL remains ON or continues blinking, a DTC(s) that affects exhaust gas is detected. In this case, Selfdiagnosis is required for performing inspection and repair.

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-158. "Description".
Throttle valve closed position learning	ECM can learn the throttle valve closed position. Refer to EC-159, "Description".
Idle air volume learning	ECM can learn the idle air volume. Refer to EC-160. "Description".
Mixture ratio self-learning value clear	Mixture ratio self-learning value can be erased. Refer to <u>EC-162</u> , " <u>Description</u> ".

EC-70

BULB CHECK MODE

Description

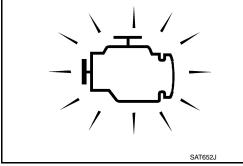
This function allows damage inspection in the MIL bulb (blown, open circuit, etc.).

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-561, "Diagnosis Procedure"</u>.

SRT STATUS MODE

Description



INFOID:000000011939688

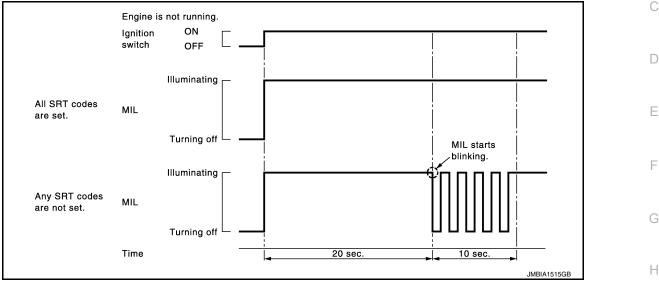
INFOID:000000011939689

< SYSTEM 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.
 - · ECM blinks MIL for about 10 seconds if all SRT codes are not set.



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.	K
	If it remains OFF, check MIL circuit. Refer to EC-561, "Diagnosis Procedure".	
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	L

- 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 malfunction.
- 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.

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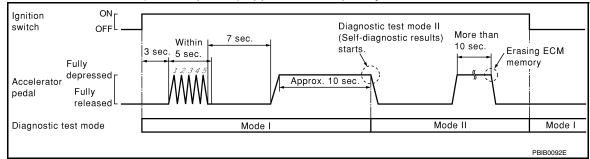
3. Wait 7 seconds, fully depress the accelerator pedal and keep it depressed for approx. 10 seconds until the MIL starts blinking.

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.

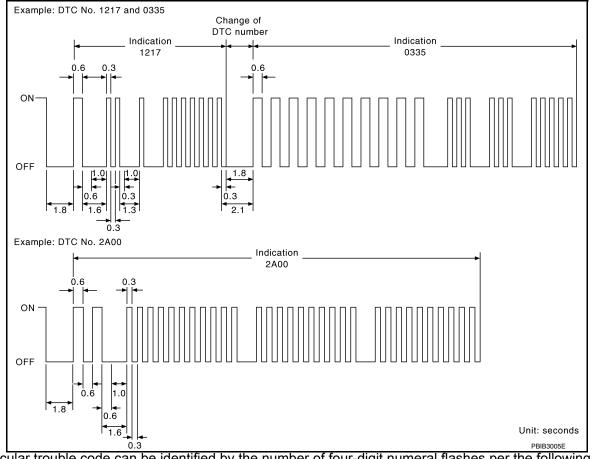
Wait until the same DTC (or 1st trip DTC) appears to completely confirm all DTCs.



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

< SYSTEM DESCRIPTION >

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	e length of time the 1,(ls) - OFF (0.6-seconds	000th-digit numeral flashes on and off is 1.2 seconds consisting of an ON (0.6-sec-	A
The A c nur A c In t	e 100th-digit numeral a hange from one digit r neral appears on the c hange from one troubl	and lower digit numerals consist of a 0.3-seconds ON and 0.3-seconds OFF cycle. numeral to another occurs at an interval of 1.0-second OFF. In other words, the later lisplay 1.3 seconds after the former numeral has disappeared. e code to another occurs at an interval of 1.8-seconds OFF. ed malfunctions are classified by their DTC numbers. The DTC 0000 refers to no mal-	EC
	v to Erase Self-diagnos		С
By we		dure, ECM memory is erased and the following diagnostic information is erased as	1
• D	iagnostic trouble code		D
	st trip diagnostic troub reeze frame data	le codes	
	st trip freeze frame data	ta	E
• \$	ystem readiness test (
	est values TE:		
Als	o, if a battery termina	I is disconnected, ECM memory is erased and the diagnostic information as listed nount of time required for erasing may vary from a few seconds to several hours.)	F
1.	Turn ignition switch C	DFF and wait at least 10 seconds.	
2.	Turn ignition switch C	DN.	G
3.	•	DFF and wait at least 10 seconds.	
4.	Turn ignition switch C		Н
5.	Set ECM in "self-diag		
6.		nation has been erased from the backup memory in the ECM. celerator pedal and keep it depressed for more than 10 seconds.	I
7.	Fully release the accord	elerator pedal, and confirm the DTC 0000 is displayed.	1
СС	NSULT Function	INFOID:000000011939690	, J
FU	NCTION		5
	Diagnostic test mode	Function	K

0	
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-107, "DTC Index"</u>.

How to Read DTC and 1st Trip DTC

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< SYSTEM DESCRIPTION >

- 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.

How to Erase DTC and 1st Trip DTC

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.

Freeze Frame Data and 1st Trip Freeze Frame Data

Freeze frame data item*	Description
DIAG TROUBLE CODE [PXXXX]	The engine control component part/control system has a trouble code that is displayed as PXXXX. (Refer to EC-107, "DTC Index".)
FUEL SYS-B1	"Fuel injection system status" at the moment a malfunction is detected is displayed.
FUEL SYS-B2	 One of the following mode is displayed. Mode2: Open loop due to detected system malfunction Mode3: Open loop due to driving conditions (power enrichment, deceleration enleanment) Mode4: Closed loop - using oxygen sensor(s) as feedback for fuel control Mode5: Open loop - has not yet satisfied condition to go to closed loop
COMBUST CONDITION	These items are displayed but are not applicable to this model.
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 sched- ule 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.
INT MANI PRES [kPa]	These items are displayed but are not applicable to this model.
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.

*: 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-86, "Reference Value".

< SYSTEM DESCRIPTION >

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×: Applicable

					×. Applicable
		Monitor Item Selection			
Monitored item	Unit	ECU IN- PUT SIG- NALS	MAIN- SIG- NALS	Description	Remarks
ENG SPEED	rpm	×	×	Indicates the engine speed comput- ed 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 en- gine is running, an abnormal value may be indicated.
B/FUEL SCHDL	ms	×	×	"Base fuel schedule" indicates the fuel injection pulse width pro- grammed 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 correction 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".
COOLANT TEMP/S	°C or °F	×	×	The engine coolant temperature (de- termined by the signal voltage of the engine coolant temperature sensor) is displayed.	When the engine coolant temperature sensor is open or short-circuited, ECM enters fail-safe mode. The engine cool- ant temperature determined by the ECM is displayed.
A/F SEN1 (B1)	V	×	×	The A/F signal computed from the input signal of the air fuel ratio (A/F) sensor 1 is displayed.	
HO2S2 (B1)	V	×	×	The signal voltage of the heated ox-	
HO2S2 (B2)	V	×	×	ygen sensor 2 is displayed.	
HO2S2 MNTR(B1) HO2S2 MNTR(B2)	RICH/ LEAN 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 displayed.	
BATTERY VOLT	V	×	×	The power supply voltage of ECM is displayed.	
ACCEL SEN 1	V	×	×	The accelerator pedal position sen-	ACCEL SEN 2 signal is converted by
ACCEL SEN 2	V	×		sor signal voltage is displayed.	ECM internally. Thus, it differs from ECM terminal voltage signal.
TP SEN 1-B1	V	×	×	The throttle position sensor signal	TP SEN 2-B1 signal is converted by ECM
TP SEN 2-B1	V	×	×	voltage is displayed.	internally. Thus, it differs from ECM ter- minal voltage signal.
FUEL T/TMP SE	°C or °F	×		The fuel temperature (determined by the signal voltage of the fuel tank temperature sensor) is displayed.	
EVAP SYS PRES	V	×		The signal voltage of EVAP control system pressure sensor is dis- played.	

< SYSTEM DESCRIPTION >

[VQ35DE]

		Monitor Item Selection			
Monitored item	Unit	ECU IN- PUT SIG- NALS	MAIN- SIG- NALS	Description	Remarks
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 signal.
CLSD THL POS	On/Off	×	×	Indicates idle position [On/Off] com- puted by ECM according to the ac- celerator pedal position sensor signal.	
AIR COND SIG	On/Off	×	×	Indicates [On/Off] condition of the air conditioner switch as determined by the air conditioner signal.	
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 lighting switch are OFF. 	
IGNITION SW	On/Off	×	×	Indicates [On/Off] condition from ig- nition switch signal.	
HEATER FAN SW	On/Off	×		Indicates [On/Off] condition from the heater fan switch signal.	
BRAKE SW	On/Off	×		Indicates [On/Off] condition from the stop lamp switch signal.	
INJ PULSE-B1	msec		×	Indicates the actual fuel injection pulse width compensated by ECM	When the engine is stopped, a certain
INJ PULSE-B2	msec			according to the input signals.	computed value is indicated.
IGN TIMING	BTDC		×	Indicates the ignition timing comput- ed 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 comput- ed by ECM according to the signal voltage of the mass air flow sensor.	
PURG VOL C/V	%			 Indicates the EVAP canister purge volume control solenoid valve control value computed by the ECM according to the input sig- nals. The opening becomes larger as the value increases. 	
INT/V TIM (B1)	°CA	×		Indicates [°CA] of intake camshaft	
INT/V TIM (B2)	°CA	×	×	advance angle.	

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Monitored item	Unit	ECU IN- PUT SIG- NALS	MAIN- SIG- NALS	Description	Remarks	EC
INT/V SOL(B1)	%		×	The control value of the intake valve timing control solenoid valve		С
INT/V SOL(B2)	%		×	(determined by ECM according to the input signals) is indicated.The advance angle becomes larger as the value increases.		D
VIAS S/V-1	On/Off		×	 The control condition of the VIAS control solenoid valve 1 (determined by ECM according to the input signals) is indicated. On: VIAS control solenoid valve 1 is operating. Off: VIAS control solenoid valve 1 is not operating. 		E
AIR COND RLY	On/Off		×	The air conditioner relay control con- dition (determined by ECM accord- ing to the input signals) is indicated.		G
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 		H
FUEL PUMP RLY	On/Off		×	Indicates the fuel pump relay control condition determined by ECM ac- cording to the input signals.		J
VENT CONT/V	On/Off			The control condition of the EVAP canister vent control valve (deter- mined by ECM according to the in- put signals) is indicated. • On: Closed • Off: Open		K
THRTL RELAY	On/Off		×	Indicates the throttle control motor relay control condition determined by the ECM according to the input signals.		Μ
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 be- comes larger as the value increas- es. 		N
HO2S2 HTR (B1)	On/Off			Indicates [On/Off] condition of heat- ed oxygen sensor 2 heater deter-		
HO2S2 HTR (B2)	On/Off			mined by ECM according to the input signals.		Ρ
I/P PULLY SPD	rpm	×		Indicates the engine speed comput- ed from the input speed sensor sig- nal.		
VEHICLE SPEED	km/h or mph	×		The vehicle speed computed from the vehicle speed signal sent from TCM is displayed.		

< SYSTEM DESCRIPTION >

	Monitor Item Selection				
Monitored item	Unit	ECU IN- PUT SIG- NALS	MAIN- SIG- NALS	Description	Remarks
IDL A/V LEARN	Yet/CM- PLT			 Displays the condition of idle air volume learning Yet: Idle Air Volume Learning has not been performed yet. CMPLT: Idle Air Volume Learning has already been performed successfully. 	
TRVL AFTER MIL	km or mile			Distance traveled while MIL is activated.	
ENG OIL TEMP	°C or °F	×		The engine oil temperature (deter- mined by the signal voltage of the engine oil temperature sensor) is displayed.	
A/F S1 HTR(B1)	%		×	 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. 	
VHCL SPEED SE	km/h or mph			The vehicle speed computed from the vehicle speed signal sent from combination meter is displayed.	
SET VHCL SPD	km/h or mph	×		 The preset vehicle speed is dis- played. 	
MAIN SW	On/Off	×		Indicates [On/Off] condition from MAIN switch signal.	
CANCEL SW	On/Off	×		Indicates [On/Off] condition from CANCEL switch signal.	
RESUME/ACC SW	On/Off	×		Indicates [On/Off] condition from RESUME/ACCELERATE switch sig- nal.	
SET SW	On/Off	×		Indicates [On/Off] condition from SET/COAST switch signal.	
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.	
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. 	

< SYSTEM DESCRIPTION >

			or Item ection			А
Monitored item	Unit	ECU IN- PUT SIG- NALS	MAIN- SIG- NALS	Description	Remarks	EC
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. 		C
AT OD MONITOR	On/Off			 Indicates [On/Off] condition of CVT O/D according to the input signal from the TCM. 		Е
AT OD CANCEL	On/Off			 Indicates [On/Off] condition of CVT O/D cancel request signal. 		F
CRUISE LAMP	On/Off			Indicates [On/Off] condition of CRUISE lamp determined by the ECM according to the input signals.		G
SET LAMP	On/Off			 Indicates [On/Off] condition of SET lamp determined by the ECM according to the input signals. 		Н
VIAS S/V-2	On/Off			 The control condition of the VIAS control solenoid valve 2 (determined by ECM according to the input signals) is indicated. On: VIAS control solenoid valve 2 is operating. Off: VIAS control solenoid valve 2 is not operating. 		l
COOLING FAN	HI/MID/ LOW/ OFF			 The control condition of the cool- ing fan (determined by ECM ac- cording to the input signals) is indicated. HI: High speed operation MID: Middle speed operation LOW: Low speed operation OFF: Stop 		K
A/F ADJ-B1 A/F ADJ-B2	_			Indicates the correction of a factor stored in ECM. The factor is calcu- lated from the difference between the target air-fuel ratio stored in ECM and the air-fuel ratio calculated from A/F sensor 1 signal.		M
P/N POSI SW	On/Off	×	×	Indicates [On/Off] condition from the park/neutral position (PNP) signal.		
INT/A TEMP SE	°C or °F	×	×	The intake air temperature (deter- mined by the signal voltage of the in- take air temperature sensor) is indicated.		O
AC PRESS SEN	V	×		The signal voltage from the refriger- ant pressure sensor is displayed.		đ
A/F SEN1 (B2)	v	×	×	The A/F signal computed from the input signal of the air fuel ratio (A/F) sensor 1 is displayed.		

< SYSTEM DESCRIPTION >

			or Item ection		
Monitored item	Unit	ECU IN- PUT SIG- NALS	MAIN- SIG- NALS	Description	Remarks
EVAP LEAK DIAG	Yet/CM- PLT			 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. 	
BAT TEMP SEN	V	×		The signal voltage from the battery temperature sensor is displayed.	
THRTL STK CNT B1*	_				
HO2 S2 DIAG1(B2)	INCMP/ CMPLT			 Indicates DTC P0139 self-diagnosis (delayed response) condition. INCMP: Self-diagnosis is incomplete. CMPLT: Self-diagnosis is complete. 	
A/F SEN1 DIAG1(B2)	INCMP/ CMPLT			 Indicates DTC P015C or P015D self-diagnosis condition. INCMP: Self-diagnosis is incomplete. CMPLT: Self-diagnosis is complete. 	
A/F SEN1 DIAG1(B1)	INCMP/ CMPLT			 Indicates DTC P015A or P015B self- diagnosis condition. INCMP: Self-diagnosis is incom- plete. CMPLT: Self-diagnosis is com- plete. 	
A/F SEN1 DIAG2(B2)	INCMP/ CMPLT			 Indicates DTC P014E or P014F self- diagnosis condition. INCMP: Self-diagnosis is incom- plete. CMPLT: Self-diagnosis is com- plete. 	
A/F SEN1 DIAG2(B1)	INCMP/ CMPLT			 Indicates DTC P014C or P014Dself- diagnosis condition. INCMP: Self-diagnosis is incom- plete. CMPLT: Self-diagnosis is com- plete. 	
A/F SEN1 DIAG3(B2)	ABSNT/ PRSNT			 Indicates DTC P014E, P014F, P015C or P015D self-diagnosis con- dition. ABSNT: The vehicle condition is not within the diagnosis range. PRSNT: The vehicle condition is within the diagnosis range. 	

< SYSTEM DESCRIPTION >

	Monitor Item Selection				
Monitored item	Unit	ECU IN- PUT SIG- NALS	MAIN- SIG- NALS	Description	Remarks
A/F SEN1 DIAG3(B1)	ABSNT/ PRSNT			 Indicates DTC P014C, P014D, P015A or P015B self-diagnosis con- dition. ABSNT: The vehicle condition is not within the diagnosis range. PRSNT: The vehicle condition is within the diagnosis range. 	
HO2 S2 DIAG2(B2)	INCMP/ CMPLT			 Indicates DTC P0139 self-diagnosis (slow response) condition. INCMP: Self-diagnosis is incomplete. CMPLT: Self-diagnosis is complete. 	
HO2 S2 DIAG2(B1)	INCMP/ CMPLT			 Indicates DTC P0139 self-diagnosis (slow response) condition. INCMP: Self-diagnosis is incomplete. CMPLT: Self-diagnosis is complete. 	
EOP SENSOR	mV	×		The signal voltage of EOP sensor is displayed.	
HO2 S2 DIAG1(B1)	INCMP/ CMPLT			 Indicates DTC P0139 self-diagnosis (delayed response) condition. INCMP: Self-diagnosis is incomplete. CMPLT: Self-diagnosis is complete. 	
MASS AIR FLOW	Hz	×		The signal frequency of the mass air	
SENSOR (Hz) EXH/V TIM B1	°CA	×	×	flow sensor is displayed. Indicates [°CA] of exhaust camshaft	
EXH/V TIM B2	°CA	×	×	advance angle.	
VTC DTY EX B1	%			_	
VTC DTY EX B2	%			_	
A/F-S ATMSPHRC CRCT B1	_			Displays a determined value of at- mospheric correction factor neces- sary for correcting an A/F sensor signal input to ECM. The signal used for the correction is an A/F sensor signal transmitted while driving un- der atmospheric pressure.	
A/F-S ATMSPHRC CRCT B2	_			Displays a determined value of at- mospheric correction factor neces- sary for correcting an A/F sensor signal input to ECM. The signal used for the correction is an A/F sensor signal transmitted while driving un- der atmospheric pressure.	
A/F-S ATMSPHRC CRCT UP B1	count			Displays the number of updates of the A/F sensor atmospheric correction factor.	

< SYSTEM DESCRIPTION >

		Monitor Item Selection				
Monitored item	Unit	ECU IN- PUT SIG- NALS	MAIN- SIG- NALS	Description	Remarks	
A/F-S ATMSPHRC CRCT UP B2	count			Displays the number of updates of the A/F sensor atmospheric correction factor.		
SYSTEM 1 DIAGNO- SIS A B2	INCMP/ CMPLT			 Indicates DTC P219B self-diagno- sis condition. INCMP: Self-diagnosis is incom- plete. CMPLT: Self-diagnosis is com- plete. 		
SYSTEM 1 DIAGNO- SIS A B1	INCMP/ CMPLT			 Indicates DTC P219A self-diagnosis condition. INCMP: Self-diagnosis is incomplete. CMPLT: Self-diagnosis is complete. 		
SYSTEM 1 DIAGNO- SIS B B2	ABSNT/ PRSNT			 Indicates DTC P219B self-diagno- sis condition. ABSNT: Self-diagnosis standby PRSNT: Under self-diagnosis 		
SYSTEM 1 DIAGNO- SIS B B1	ABSNT/ PRSNT			 Indicates DTC P219A self-diagno- sis condition. ABSNT: Self-diagnosis standby PRSNT: Under self-diagnosis 		

*: 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.

WORK SUPPORT MODE

Work Item

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

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WORK ITEM	CONDITION	USAGE	٥
TARGET IGN TIM ADJ*	Idle condition	When adjusting target ignition timing	A
TARGET IDLE RPM ADJ*	Idle condition	When setting target idle speed	
VIN REGISTRATION	In this mode, VIN is registered in ECM	When registering VIN in ECM	EC
CLSD THL POS LEARN	Ignition on and engine stopped.	When learning the throttle valve closed position	
SAVING DATA FOR RE- PLC CPU	In this mode, save data that is in ECM.	When ECM is replaced.	С
WRITING DATA FOR RE- PLC 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.			D

*: 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
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
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
FUEL/T TEMP SEN	Change the fuel tank temperature	using CONSULT.	
INT V/T ASSIGN ANGLE	 Engine: Return to the original non-standard condition Change intake valve timing using CONSULT. 	If malfunctioning symptom disappears, 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 solenoid valve
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
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
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
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

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TEST ITEM	CONDITION	JUDGMENT	CHECK ITEM (REMEDY)
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
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

*: Leaving cooling fan OFF with CONSULT while engine is running may cause the engine to overheat.

DTC WORK SUPPORT MODE

Test	item
1000	

Test mode	Test item	Corresponding DTC No.	Reference page
	A/F SEN1(B1) P1276	P0130	<u>EC-252</u>
	A/F SEN1(B2) P1286	P0150	<u>EC-252</u>
A/F SEN1	A/F SENSOR1(B1) P014C, P014D	P014C, P014D	<u>EC-282</u>
WE SENT	A/F SENSOR1(B2) P014E, P014F	P014E, P014F	<u>EC-282</u>
	A/F SENSOR1(B1) P015A, P015B	P015A, P015B	<u>EC-282</u>
	A/F SENSOR1(B2) P015C, P015D	P015C, P015D	<u>EC-282</u>
	PURG FLOW P0441	P0441	<u>EC-341</u>
EVAPORATIVE SYSTEM	PURG VOL CN/V P1444	P0443	<u>EC-347</u>
	HO2S2(B1) P1146	P0138	<u>EC-268</u>
	HO2S2(B1) P1147	P0137	<u>EC-262</u>
H02S2	HO2S2(B1) P0139	P0139	<u>EC-276</u>
NU232	HO2S2(B2) P1166	P0158	<u>EC-268</u>
	HO2S2(B2) P1167	P0157	<u>EC-262</u>
	HO2S2(B2) P0159	P0159	<u>EC-276</u>

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:

< SYSTEM DESCRIPTION >

[VQ35DE]

JSBIA0062GB

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 "Igni

NENT DTC & SRT CONFIRM	ATION : PERMANENT DTC STATUS	3	
CAUTION: Turn ignition switch from O status screen.	N to OFF twice to update the informa	ation on the	
PERMANENT DTC	DRIVING PATTERN B	DRIVING PATTERN D	
xxxx	INCMP	INCMP	
хххх	CMPLT	INCMP	
хххх	INCMP	CMPLT	
xxxx	CMPLT	INCMP	
ХХХХ	INCMP	INCMP	
XXXX	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.

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ECU DIAGNOSIS INFORMATION

Reference Value

INFOID:000000011939691

[VQ35DE]

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.

For outlines of following items, refer to EC-73. "CONSULT Function".

Monitor Item	0	Condition	Values/Status
ENG SPEED	Run engine and compare CONSULT value with the tachometer indication.		Almost the same speed as the tachometer indication.
MAS AIR FLOW SENSOR (Hz)	See <u>EC-182. "Description"</u> .		
B/FUEL SCHDL	See EC-182, "Description".		
A/F ALPHA-B1	See EC-182, "Description".		
A/F ALPHA-B2	See EC-182, "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
HO2S2 (B1)	 Revving engine from idle to 3,000 rpm quickly after the following conditions are met. Engine: After warming up After keeping engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load 		0 - 0.3 V ↔ Approx. 0.6 - 1.0 V
HO2S2 (B2)	 Revving engine from idle to 3,000 rpm quickly after the following conditions are met. Engine: After warming up After keeping engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load 		0 - 0.3 V ↔ Approx. 0.6 - 1.0 V
HO2S2 MNTR(B1)	 Revving engine from idle to 3,000 rpm quickly after the following conditions are met. Engine: After warming up After keeping engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load 		$LEAN \longleftrightarrow RICH$
HO2S2 MNTR(B2)	 Revving engine from idle to 3,000 rpm quickly after the following conditions are met. Engine: After warming up After keeping engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load 		$LEAN \leftarrow \rightarrow RICH$
VHCL SPEED SE	Turn drive wheels and compare CO tion.	NSULT value with the speedometer indica-	Almost the same speed as speedometer indication
BATTERY VOLT	Ignition switch: ON (Engine stopped	1)	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

< ECU DIAGNOSIS INFORMATION >

Monitor Item	(Condition	Values/Status	•
	Ignition switch: ON	Accelerator pedal: Fully released	More than 0.36 V	A
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	EC
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	С
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	D
START SIGNAL	Ignition switch: $ON \rightarrow START \rightarrow ON$	١	$Off\toOn\toOff$	-
CLSD THL POS	Ignition switch: ON	Accelerator pedal: Fully released	On	E
CLOD THE POS	(Engine stopped)	Accelerator pedal: Slightly depressed	Off	-
	Engine: After worming up idle the	Air conditioner switch: OFF	Off	F
AIR COND SIG	Engine: After warming up, idle the engine	Air conditioner switch: ON (Compressor operates.)	On	
PW/ST SIGNAL	Engine: After warming up, idle the	Steering wheel: Not being turned	Off	G
FW/ST SIGNAL	engine	Steering wheel: Being turned	On	
		Rear window defogger switch: ON	_	-
LOAD SIGNAL	Ignition quitch: ON	and/or Lighting switch: 2nd position	On	Н
LOAD SIGNAL	Ignition switch: 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	J
		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	- K
INJ PULSE-B1	 Selector lever: P or N position Air conditioner switch: OFF No load 	2,000 rpm	1.9 - 2.9 msec	L
	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	M
	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	N
	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%	0
	Engine: After warming up	Idle	2.0 - 6.0 g/s	D
MASS AIRFLOW	 Selector lever: P or N position Air conditioner switch: OFF No load 	2,500 rpm	7.0 - 20.0 g/s	_ P
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	—	_

< ECU DIAGNOSIS INFORMATION >

Monitor Item	C	Condition	Values/Status
	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	Idle	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 	When revving engine up to 5,000 rpm quickly	$Off \to On \to Off$
	Engine: After warming up, idle the	Air conditioner switch: OFF	Off
AIR COND RLY	engine	Air conditioner switch: ON (Compressor operates)	On
ENGINE MOUNT	Engine: After warming up	Below 950 rpm	IDLE
		Above 950 rpm	TRVL
FUEL PUMP RLY	For 1 second after turning ignition switch: ONEngine running or cranking		On
	Except above		Off
VENT CONT/V	Ignition switch: ON		Off
THRTL RELAY	Ignition switch: ON	On	
A/F S1 HTR(B2)	Engine: After warming up, idle the engine (More than 140 seconds after starting engine)		4 - 100%
HO2S2 HTR (B1)	 Engine speed: Below 3,600 rpm after Engine: After warming up Keeping the engine speed betweet idle for 1 minute under no load 	er the following conditions are met. en 3,500 and 4,000 rpm for 1 minute and at	On
	Engine speed: Above 3,600 rpm		Off
HO2S2 HTR (B2)	 Engine speed: Below 3,600 rpm after Engine: After warming up Keeping the engine speed betwee idle for 1 minute under no load 	er the following conditions are met. en 3,500 and 4,000 rpm for 1 minute and at	On
	Engine speed: Above 3,600 rpm		Off
I/P PULLY SPD	Vehicle speed: More than 20 km/h (12 MPH)	Almost the same speed as the tachometer indication
VEHICLE SPEED	Turn drive wheels and compare COl tion.	NSULT value with the speedometer indica-	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
		Idle air volume learning has already been performed successfully.	CMPLT
TRVL AFTER MIL	Ignition switch: ON	Vehicle has traveled after MIL has illuminated.	0 - 65,535 km (0 - 40,723 miles)
ENG OIL TEMP	Engine: After warming up		More than 70°C (158°F)

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Monitor Item	Condition		Values/Status
A/F S1 HTR(B1)	Engine: After warming up, idle the engine (More than 140 seconds after starting engine)		4 - 100%
VHCL SPEED SE	Turn drive wheels and compare CONSULT value with the speedometer indica- tion.		Almost the same speed as the speedometer indication
SET VHCL SPD	Engine: Running	ASCD: Operating	The preset vehicle speed is displayed
		MAIN switch: Pressed	On
MAIN SW	Ignition switch: ON	MAIN switch: Released	Off
		CANCEL switch: Pressed	On
CANCEL SW	Ignition switch: ON	CANCEL switch: Released	Off
		RES/+ switch: Pressed	On
RESUME/ACC SW	Ignition switch: ON	RES/+ switch: Released	Off
		SET/– switch: Pressed	On
SET SW	Ignition switch: ON	SET/– 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		Brake pedal: Fully released	Off
(Stop lamp switch)	Ignition switch: ON	Brake pedal: Slightly depressed	On
VHCL SPD CUT	Ignition switch: ON		Non
LO SPEED CUT	Ignition switch: ON		Non
AT OD MONITOR	Ignition switch: ON		Off
AT OD CANCEL	Ignition switch: ON		Off
		MAIN switch: Pressed at the 1st time \rightarrow	Oli
CRUISE LAMP	Ignition switch: ON	at the 2nd time	$On \rightarrow Off$
	MAIN switch: ON	ASCD: Operating	On
SET LAMP	When vehicle speed is between 40 km/h (25 MPH) and 144 km/h (89 MPH)	ASCD: Not operating	Off
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	$Off \rightarrow On \rightarrow Off$
		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
A/F ADJ-B1	Engine: Running		-0.330 - 0.330
A/F ADJ-B2	Engine: Running		-0.330 - 0.330
		Selector lever: P or N position	On
P/N POSI SW	Ignition switch: ON	Selector lever: Except above position	Off
INT/A TEMP SE	Ignition switch: ON	<u> </u>	Indicates intake air tempera- ture
AC PRESS SEN	 Engine: Idle Both A/C switch and blower fan sw 	vitch: ON (Compressor operates)	1.0 - 4.0 V
	Engine: After warming up	Maintaining engine speed at 2,000 rpm	Fluctuates around 2.2 V

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< ECU DIAGNOSIS INFORMATION >

Monitor Item	(Condition	Values/Status
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.
BAT TEMP SEN	 Engine: After warming up Selector lever: P or N position Air conditioner switch: OFF No load 	Idle	Approx. 0.68 V
THRTL STK CNT B1 ^{*3}	_		_
	DTC P0159 self-diagnosis (delayed response) has not been performed yet.		INCMP
HO2 S2 DIAG1(B2)	DTC P0159 self-diagnosis (delayed cessfully.	response) has already been performed suc-	CMPLT
A/F SEN1 DIAG1	DTC P015C and P015D self-diagno	sis is incomplete.	INCMP
(B2)	DTC P015C and P015D self-diagno	sis is complete.	CMPLT
A/F SEN1 DIAG1	DTC P015A and P015B self-diagno	sis is incomplete.	INCMP
(B1)	DTC P015A and P015B self-diagno	sis is complete.	CMPLT
A/F SEN1 DIAG2	DTC P014E and P014F self-diagno	sis is incomplete.	INCMP
(B2)	DTC P014E and P014F self-diagno	sis is complete.	CMPLT
A/F SEN1 DIAG2	DTC P014C and P014D self-diagno	sis is incomplete.	INCMP
(B1)	DTC P014C and P014D self-diagno	sis is complete.	CMPLT
A/F SEN1 DIAG3	The vehicle condition is not within the diagnosis range of DTC P014E, P014F, P015C or P015D.		ABSNT
(B2)	The vehicle condition is within the diagnosis range of DTC P014E, P014F, P015C or P015D.		PRSNT
A/F SEN1 DIAG3	The vehicle condition is not within th P015A or P015B.	ne diagnosis range of DTC P014C, P014D,	ABSNT
(B1)	The vehicle condition is within the d P015A or P015B.	iagnosis range of DTC P014C, P014D,	PRSNT
	DTC P0159 self-diagnosis (slow response) has not been performed yet.		INCMP
HO2 S2 DIAG2(B2)	DTC P0159 self-diagnosis (slow res cessfully.	ponse) has already been performed suc-	CMPLT
	DTC P0139 self-diagnosis (slow res	ponse) has not been performed yet.	INCMP
HO2 S2 DIAG2(B1)	DTC P0139 self-diagnosis (slow res cessfully.	ponse) has already been performed suc-	CMPLT
	Engine: After warming up	Idle	Approx. 1,450 mV
EOP SENSOR	 Selector lever: P or N position Air conditioner switch: OFF No load 	2,000 rpm	Approx. 2,850 mV
	DTC P0139 self-diagnosis (delayed	response) has not been performed yet.	INCMP
HO2 S2 DIAG1(B1)		response) has already been performed suc-	CMPLT
	Engine: After warming up	Idle	–5 - 5°CA
EXT/V TIM B1	 Selector lever: N position Air conditioner switch: OFF No load 	Around 2,500 rpm while the engine speed is rising	Approx. 0 - 30°CA
	Engine: After warming up	Idle	–5 - 5°CA
EXT/V TIM B2	 Selector lever: N position Air conditioner switch: OFF No load 	Around 2,500 rpm while the engine speed is rising	Approx. 0 - 30°CA

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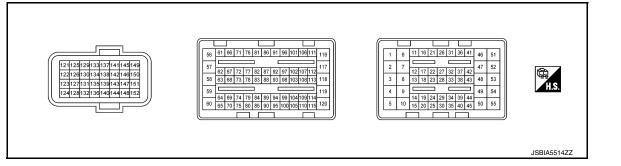
Monitor Item	Condition		Values/Status	
	Engine: After warming up	Idle	0 - 2%	A
VTC DTY EX B1	 Selector lever: N position Air conditioner switch: OFF No load 	Around 2,500 rpm while the engine speed is rising	Approx. 0 - 70%	EC
	Engine: After warming up	Idle	0 - 2%	
VTC DTY EX B2	 Selector lever: N position Air conditioner switch: OFF No load 	Around 2,500 rpm while the engine speed is rising	Approx. 0 - 70%	С
A/F-S ATMSPHRC CRCT B1	Engine: After warming up, idle the	engine	Varies depending on vehicle environment.	
A/F-S ATMSPHRC CRCT B2	Engine: After warming up, idle the engine		Varies depending on vehicle environment.	D
A/F-S ATMSPHRC CRCT UP B1	Engine: Running		Varies depending on the number of updates.	E
A/F-S ATMSPHRC CRCT UP B2	Engine: Running		Varies depending on the number of updates.	
SYSTEM 1 DIAG-	DTC P219A self-diagnosis is incomplete.		INCMP	F
NOSIS A B1	DTC P219A self-diagnosis is complete.		CMPLT	
SYSTEM 1 DIAG-	DTC P219B self-diagnosis is inco	mplete.	INCMP	G
NOSIS A B2	DTC P219B self-diagnosis is complete.		CMPLT	
SYSTEM 1 DIAG-	DTC P219A self-diagnosis is on standby.		ABSENT	
NOSIS B B1	DTC P219A self-diagnosis is unde	er diagnosis.	PRSENT	F
SYSTEM 1 DIAG-	DTC P219B self-diagnosis is on s	tandby.	ABSENT	
NOSIS B B2	DTC P219B self-diagnosis is unde	er diagnosis.	PRSENT	I

*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-92, "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.

< ECU DIAGNOSIS INFO

Terminal No.

152

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152

(GR)

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3 (W)

SIS INFORMATION >			[VQ35DE]
Description			
Signal name	Input/ Output	Condition	Value (Approx.)
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
Throttle control motor power supply	Input	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)
Throttle control motor (Open)	Outout	 [Ignition switch: ON] Engine stopped Selector lever: D position Accelerator pedal: Fully depressed 	0 - 14 V★ 500µSec/div 500µSec/div 50/div JMBIA0031GB
	Output	 [Ignition switch: ON] Engine stopped Selector lever: D position Accelerator pedal: Fully released 	0 - 14 V★ 500µSec/div
Sensor ground [Knock sensor (bank 1), Knock sensor (bank 2)]		_	_

				leased	5V/div JMBIA0032GB
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)	152 (GR)	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 € 50mSec/div
7 (SB)	152 (GR)	Heated oxygen sensor 2 heat- 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 be- tween 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load [Ignition switch: ON] Engine stopped [Engine is running] Engine speed: Above 3,600 rpm 	10 V★ 50mSec/div 50mSec/div 50/div JMBIA0902GB BATTERY VOLTAGE (11 - 14 V)

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< ECU DIAGNOSIS INFORMATION >

Termin	erminal No. Description				Value			
+		Signal name	Input/ Output	Condition	(Approx.)			
8	152	Throttle control motor relay	Output	[Ignition switch: $ON \rightarrow OFF$]	0 - 1.0 V \rightarrow BATTERY VOLTAGE	1		
(BR)	(GR)	Throttle control motor relay	Output	[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		_	_			
11 (P)		Fuel injector No. 5			BATTERY VOLTAGE (11 - 14 V)★			
12 (W)		Fuel injector No. 4		[Engine is running] • Warm-up condition	50mSec/div			
16 (R)	450	Fuel injector No. 2		Engine speed: 2,000 rpm	10V/div JMBIA0048GB			
17	152 (GR)		Output		10V/div JMBIA0048GB BATTERY VOLTAGE			
(G)	(- · - /	Fuel injector No. 1			(11 - 14 V)★			
21 (G)		Fuel injector No. 6		 [Engine is running] Warm-up condition Idle speed NOTE: 	50mSec/div			
22 (P)		Fuel injector No. 3	-	The pulse cycle changes de- pending on rpm at idle	LINCOUTE AND ADDRESS AND ADDRE			
13 (Y)	15 (L)	Engine oil temperature sensor	Input	[Engine is running]	0 - 4.8 V Output voltage varies with engine oil temperature.			
14	18		lanut	[Engine is running] • Warm-up condition • Idle speed	1.3 V★ 5mSec/div			
(LG)	(R)	Engine oil pressure sensor	Input	Input	Input	[Engine is running]Warm-up conditionEngine speed is 2,000 rpm	2.7 V★ 5mSec/div ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	
15 (L)	_	Sensor ground (Engine oil temperature sen- sor, engine oil pressure sen- sor)	_	_	_			
18 (R)	15 (L)	Sensor power supply (Engine oil pressure sensor)	_	[Ignition switch: ON]	5 V			
(**)	25 (V)	Sensor power supply (Refrigerant pressure sensor)						

< ECU DIAGNOSIS INFORMATION >

Termin	al No.	Description			Value
+		Signal name	Input/ Output	Condition	(Approx.)
19 (V)	152 (GR)	Fuel pump relay	Output	 [Ignition switch: ON] For 1 second after turning ig- nition switch ON [Engine is running] 	0 - 1.0 V
20 (SB)	25 (V)	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
25 (V)		Sensor ground (Refrigerant pressure sensor)	_	_	_
28 (LG)	40 (BR)	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
31 (P)	35 (B)	Engine coolant temperature sensor	Input	[Engine is running]	0 - 4.8 V Output voltage varies with engine coolant temperature.
32 (W)	152 (GR)	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
34 (Y)	40 (BR)	Intake air temperature sensor	Input	[Engine is running]	0 - 4.8 V Output voltage varies with intake air temperature.
35 (B)	_	Sensor ground (Heated oxygen sensor 2, en- gine coolant temperature sen- sor)	_	_	_
36	40	Crankshaft position sensor	Input	 [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
(L)	(BR)	(POS)	mput	[Engine is running] Engine speed: 2,000 rpm	4.0 - 5.0 V★ 1mSec/div € 2V/div JMBIA0042GB

< ECU DIAGNOSIS INFORMATION >

[VQ35DE]

Termin	al No.	Description			Value	
+		Signal name	Input/ Output	Condition	(Approx.)	A
				 [Engine is running] Warm-up condition Idle speed NOTE: 	4.0 – 5.0 V★ 20mSec/div	EC
37 (GR)	152 (GR)	Exhaust valve timing control position sensor (bank 1)	Input	The pulse cycle changes de- pending on rpm at idle	2V/div JMBIA0043GB	C
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	4.0 - 5.0 V★ 20mSec/div	E
					2V/div JMBIA0044GB 3,720 Hz	
				[Ignition switch: ON] • Engine stopped	2mSec/div	G
					3,900 – 4,500 Hz	
38 (GR)	40 (BR)	Mass air flow sensor	Input	[Engine is running]Warm-up conditionIdle speed		J
					2V/div JSBIA2957ZZ	K
				 [Engine is running] Warm-up condition Engine speed: idle to about 4,000 rpm NOTE: 	3,900 – 4,500 → 8000 Hz 2mSec/div	L
				Check for linear frequency rise in response to engine being in- creased to about 4,000 rpm	2V/div JSBIA2957ZZ	Μ

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< ECU DIAGNOSIS INFORMATION >

Termin	al No.	Description) (alua
+		Signal name	Input/ Output	Condition	Value (Approx.)
39	152	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
(GR)	(GR)	position sensor (bank 2)	mpat	[Engine is running]Warm-up conditionEngine speed: 2,000 rpm	4.0 – 5.0 V★ 20mSec/div 20mSec/div 20mSec/div 20mSec/div 20mSec/div
40 (BR)	_	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 (GR)	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 (Y)	152 (GR)	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 € 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
47 (SB)	152 (GR)	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 50mSec/div
				 [Ignition switch: ON] Engine stopped [Engine is running] Engine speed: Above 3,600 rpm 	BATTERY VOLTAGE (11 - 14 V)

< ECU DIAGNOSIS INFORMATION >

Termin	al No.	Description				
+		Signal name	Input/ Output	Condition	Value (Approx.)	A
49	152	Electronic controlled engine		[Engine is running] Idle speed	0 - 1.0 V	EC
(V)	(GR)	mount control solenoid valve	Output	[Engine is running] Engine speed: More than 950 rpm	BATTERY VOLTAGE (11 - 14 V)	С
				 [Engine is running] Idle speed Accelerator pedal: Not depressed even slightly, after engine starting 	BATTERY VOLTAGE (11 - 14 V)★ 50mSec/div	D
54 (BR)	152 (GR)	EVAP canister purge volume control solenoid valve	Output		10V/div JMBIA0039GB BATTERY VOLTAGE (11 - 14 V)★	F
				[Engine is running] Engine speed: approximately 2,000 rpm (More than 100 sec- onds after starting engine)	50mSec/div	G
55 (B)	_	ECM ground	_	_		
58 (SB)	152 (GR)	Exhaust valve timing control solenoid valve (bank 1)	Output	[Engine is running] • Warm-up condition • Idle speed [Engine is running]	0 V BATTERY VOLTAGE	J
60	152	Exhaust valve timing control	Output	 Warm-up condition Engine speed: 2,000rpm [Engine is running] Warm-up condition Idle speed 	(11 – 14 V) 0 V	K
(BR)	(GR)	solenoid valve (bank 2)	Output	[Engine is running]Warm-up conditionEngine speed: 2,000rpm	BATTERY VOLTAGE (11 – 14 V)	
64 (G)		Sensor ground (Battery current sensor, bat- tery temperature sensor)	_	_	_	Μ
66 (W)	152 (GR)	A/F sensor 1 (bank 1)	Input	[Ignition switch: ON]	1.8 V	Ν
67 (B)	152 (GR)	A/F sensor 1 (bank 1)	Input	[Engine is running]Warm-up conditionEngine speed: 2,000 rpm	2.2 V Output voltage varies with air fuel ratio.	0
68 (R)	64 (G)	Battery temperature sensor	Input	[Engine is running]	0 - 4.8 V Output voltage varies with battery temperature.	Ρ
69 (W)	64 (G)	Battery current sensor	Input	[Engine is running] • Battery: Fully charged* ² • Idle speed	2.6 - 3.5 V	
70 (GR)		Shield			_	

< ECU DIAGNOSIS INFORMATION >

Termin	al No.	Description			Value
+		Signal name	Input/ Output	Condition	(Approx.)
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
(B)	(GR)		mput	 [Ignition switch: ON] Engine stopped Selector lever: D position Accelerator pedal: Fully depressed 	Less than 4.75 V
72 (W)	152 (GR)	Throttle position sensor 2	Input	 [Ignition switch: ON] Engine stopped Selector lever: D position Accelerator pedal: Fully released [Ignition switch: ON] 	Less than 4.75 V
				 Engine stopped Selector lever: D position Accelerator pedal: Fully depressed 	More than 0.36 V
75 (R)		Sensor ground (Throttle position sensor)	_		_
76 (W)	152 (GR)	A/F sensor 1 (bank 2)	Input	[Ignition switch: ON]	1.8 V
77 (B)	152 (GR)	A/F sensor 1 (bank 2)	Input	[Engine is running]Warm-up conditionEngine speed: 2,000 rpm	2.2 V Output voltage varies with air fuel ratio.
80 (GR)	_	Shield	_	_	_
83	152			[Ignition switch: ON] Selector lever: P or N position	BATTERY VOLTAGE (11 - 14 V)
(LG)	(GR)	PNP signal	Input	[Ignition switch: ON] Selector lever: Except above position	0 V
84	90	Camshaft position sensor	Input	 [Engine is running] Warm-up condition Idle speed NOTE: The pulse cycle changes depending on rpm at idle 	3.0 - 5.0 V★ 20mSec/div € 2V/div JMBIA0045GB
(GR) (LG)			[Engine is running] Engine speed is 2,000 rpm	3.0 - 5.0 V★ 20mSec/div 2V/div JMBIA0046GB	

Termin	nal No.	Description			Value	
+		Signal name	Input/ Output	Condition	(Approx.)	
86 (G)	152 (GR)	ECM relay (Self shut-off)	Output	 [Engine is running] [Ignition switch: OFF] A few seconds after turning ignition switch OFF 	0 - 1.5 V	
(0)	(01()			[Ignition switch: OFF] More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14 V)	
87 (P)	64 (G)	Sensor power supply (Battery current sensor)	—	[Ignition switch: ON]	5 V	
89	90	Camshaft position sensor	Input	 [Engine is running] Warm-up condition Idle speed NOTE: The pulse cycle changes depending on rpm at idle 	3.0 - 5.0 V★ 20mSec/div € 2V/div JMBIA0045GB	
(GR)	(LG)	(PHASE) (bank 2)	Input	input	[Engine is running] Engine speed is 2,000 rpm	3.0 - 5.0 V★ 20mSec/div € 2V/div JMBIA0046GB
90 (LG)	_	Sensor ground [Camshaft position sensor (PHASE) (bank 1), camshaft position sensor (PHASE) (bank 2)]	_	_		
92 (BR)	90 (LG)	Sensor power supply [Camshaft position sensor (PHASE) (bank 1), camshaft position sensor (PHASE) (bank 2)]	_	[Ignition switch: ON]	5 V	
98 (G)	75 (R)	Sensor power supply (Throttle position sensor)	_	[Ignition switch: ON]	5 V	
				[Engine is running]Warm-up conditionIdle speed	BATTERY VOLTAGE (11 - 14 V)	
102 (W)	152 (GR)	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)	

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< ECU DIAGNOSIS INFORMATION >

Termin	al No.	Description			Value
+		Signal name	Input/ Output	Condition	(Approx.)
103 (P) 104		Ignition signal No. 3		[Engine is running] • Warm-up condition	0 - 0.2 V★ 50mSec/div
(R) 106 (P)	152	Ignition signal No. 6 Ignition signal No. 2	Output	Idle speed NOTE: The pulse cycle changes de- pending on rpm at idle	₹ 2V/div JMBIA0035GB
107 (G)	(GR)	Ignition signal No. 5	Output		0.1 - 0.4 V★ 50mSec/div
113 (G)		Ignition signal No. 1		[Engine is running]Warm-up conditionEngine speed: 2,000 rpm	
114 (W)		Ignition signal No. 4			2V/div JMBIA0036GB
105 (B)	_	ECM ground	—	_	_
				[Engine is running] • Warm-up condition • Idle speed	BATTERY VOLTAGE (11 - 14 V)
108 (R)	152 (GR)	VIAS control solenoid valve 1	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)
110 (B)	_	ECM ground		_	_
116 (SB)	152 (GR)	Power supply for ECM (Back- up)	Input	[Ignition switch: OFF]	BATTERY VOLTAGE (11 - 14 V)
117	152	Intake valve timing control so-		[Engine is running]Warm-up conditionIdle speed	0 V
(BR)	(GR)	lenoid valve (bank 1)	Output	[Engine is running]Warm-up conditionWhen revving engine up to 2,000rpm quickly	BATTERY VOLTAGE (11 - 14 V)
		Intake valve timing intermedi-		[Engine is running]Warm-up conditionIdle speed	0 V
118 (LG)	152 (GR)	ate lock control solenoid valve (bank 1)	Output	 [Engine is running] Cold condition [Engine cool- ant temperature: below 60°C (140°F)] Idle speed 	Battery voltage (11 - 14 V)
119	152	Intake valve timing control so-	_	[Engine is running]Warm-up conditionIdle speed	0 V
(Y)	(GR)	lenoid valve (bank 2)	Output	[Engine is running]Warm-up conditionWhen revving engine up to 2,000rpm quickly	BATTERY VOLTAGE (11 - 14 V)

< ECU DIAGNOSIS INFORMATION >

[VQ35DE]

Terminal No.		Description			Value	
+		Signal name	Input/ Output	Condition	Value (Approx.)	
		Intake valve timing intermedi-		[Engine is running]Warm-up conditionIdle speed	0 V	
120 (V)	152 (GR)	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 (G)	148 (R)	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 (V)	148 (R)	Sensor power supply (EVAP control system pres- sure sensor)	_	[Ignition switch: ON]	5 V	
126		152	152	Output	 [Engine is running] Warm-up condition Idle speed NOTE: The pulse cycle changes depending on rpm at idle 	1 V★ 10mSec/div ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ 2V/div JMBIA0076GB
(R)		Guiput	[Engine is running] Engine speed is 2,000 rpm	1 V★ 10mSec/div 2V/div JMBIA0077GB		
128 (V)	148 (R)	Fuel tank temperature sensor	Input	[Engine is running]	0 - 4.8 V Output voltage varies with fuel tank temperature.	
122	150			[Ignition switch: OFF]	0 V	
133 (L)	152 (GR)	Ignition switch	Input	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)	

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< ECU DIAGNOSIS INFORMATION >

Terminal No.		Description			Value
+		Signal name	Input/ Output	Condition	(Approx.)
				[Ignition switch: ON] MAIN switch: Pressed	0 V
				[Ignition switch: ON] CANCEL switch: Pressed	1 V
		ASCD steering switch	Input	[Ignition switch: ON] RES/+ switch: Pressed	2.26 V
				[Ignition switch: ON] SET/– switch: Pressed	1.46 V
134 (G)	135 (R)			[Ignition switch: ON] MAIN switch: Pressed	0 V
				[Ignition switch: ON] CANCEL switch: Pressed	1.18 V
		ICC steering switch	Input	[Ignition switch: ON] DISTANCE switch: Pressed	1.51 V
				[Ignition switch: ON] SET/– switch: Pressed	2.00 V
				[Ignition switch: ON] RES/+ switch: Pressed	2.71 V
135 (R)		Sensor ground (ASCD steering switch)	_	_	-
139	152	Ston Jamp switch	op lamp switch Input	[Ignition switch: OFF] Brake pedal: Fully released	0 V
(GR)	(GR)			[Ignition switch: OFF] Brake pedal: Slightly depressed	BATTERY VOLTAGE (11 - 14 V)
140	152	Brake pedal position switch	Input	[Ignition switch: ON] Brake pedal: Slightly depressed	0 V
(BR)	(GR)	brake pedal position switch		[Ignition switch: ON] Brake pedal: Fully released	BATTERY VOLTAGE (11 - 14 V)
141 (Y)	152 (GR)	EVAP canister vent control valve	Output	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)
142 (SB)	144 (G)	Sensor power supply (Accelerator pedal position sensor 2)	_	[Ignition switch: ON]	5 V
143	144	Accelerator pedal position		[Ignition switch: ON]Engine stoppedAccelerator pedal: Fully released	0.25 - 0.50 V
(P)	(G)	sensor 2	Input	[Ignition switch: ON]Engine stoppedAccelerator pedal: Fully depressed	2.0 - 2.5 V
144 (G)	_	Sensor ground (Accelerator pedal position sensor 2)	_	_	_
145 (LG)	152 (GR)	Power supply for ECM	Input	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)
146 (BR)	151 (R)	Sensor power supply (Accelerator pedal position sensor 1)	_	[Ignition switch: ON]	5 V

< ECU DIAGNOSIS INFORMATION >

Termin	al No.	Description			Malua	
+		Signal name	Input/ Output	Condition	Value (Approx.)	
147 (GR) 149 (GR) 152 (GR)	_	ECM ground	_	_	_	
148 (R)		Sensor ground (EVAP control system pres- sure sensor, Fuel tank tem- perature sensor)		_		
150	151	Accelerator pedal position	lanut	[Ignition switch: ON]Engine stoppedAccelerator pedal: Fully released	0.5 - 1.0 V	
(W)	(R)	sensor 1	Input	[Ignition switch: ON]Engine stoppedAccelerator pedal: Fully depressed	4.2 - 4.8 V	
151 (R)		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-92, "How to Handle Battery".

Fail-safe

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NON DTC RELATED ITEM

Engine operating condi- tion in fail-safe mode	Detected items	Remarks	Reference page	
Engine speed will not rise more than 2,500 rpm due to the fuel cut	Malfunction indicator lamp circuit	When there is an open circuit on MIL circuit, the ECM cannot warn the driver by illuminating MIL when there is malfunction on engine control system. Therefore, when electrical controlled throttle and part of ECM related diagnoses are continuously detected as NG for 5 trips, ECM warns the driver that engine control system malfunctions and MIL circuit is open by means of operating the fail-safe function. The fail-safe function also operates when above diagnoses except MIL circuit are detected and demands the driver to repair the malfunction.	<u>EC-561</u>	ľ

DTC RELATED ITEM

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. ECM activates the IVT intermediate lock control solenoid valve to bring the cam sprocket into an intermediate lock condition. 	(
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.	ŀ
P0101 P0102 P0103	Mass air flow sensor circuit	Engine speed will not rise more than 2,400 rpm due to the fuel cut.	

< ECU DIAGNOSIS INFORMATION >

DTC No.	Detected items	Engine opera	ating condition in fail-safe mode				
P0117 P0118	Engine coolant tempera- ture sensor circuit	Engine coolant temperature will be CONSULT displays the engine coo	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	The ECM controls the electric throttle control actuator in regulating the throttle opening is 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.					
P0524	Engine oil pressure		ning lamp on the combination meter. han 4,000 rpm due to the fuel cut. on switch OFF \rightarrow ON.				
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 confixed opening (approx. 5 degrees) The position of the following common lintake valve timing control solence Exhaust valve timing control solence Intake manifold runner control valore ASCD operation may be deactive 	ponents is fixed. bid valve noid valve live				
P0605 P0606 P060B	ECM	 NOTE: Fail-safe may not occur depending ECM stops the electric throttle confixed opening (approx. 5 degrees The position of the following common lintake valve timing control solence Exhaust valve timing control sole Intake manifold runner control val ASCD operation may be deactive 	ntrol actuator control, throttle valve is maintained at a s) by the return spring. ponents is fixed. bid valve enoid valve live				
P060A	ECM	 NOTE: Fail-safe may not occur depending ECM stops the electric throttle confixed opening (approx. 5 degrees) The position of the following common lintake valve timing control solence Exhaust valve timing control solence Intake manifold runner control van Engine torque may be limited. ASCD operation may be deactive 	ntrol actuator control, throttle valve is maintained at a s) by the return spring. iponents is fixed. bid valve enoid valve live				

< 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 Exhaust valve timing control solenoid valve Intake manifold runner control 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)	rol actuator control, throttle valve is maintained at a by the return spring.	Е			
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 cont fixed opening (approx. 5 degrees)	rol actuator control, throttle valve is maintained at a by the return spring.	F			
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					
P2122 P2123 P2127 P2128 P2138	Accelerator pedal position sensor	or more. 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

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[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)	Detected items (DTC)		
1	U0101, U1000, U1001	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		
	P0520	EOP sensor		
	P0603, P0604, P0605, P0606, P0607, P060A, P060B, P062F, P2610	ECM		
	P0643	Sensor power supply		
	P0850	Transmission range switch		
	P1078, P1084	Exhaust valve timing control position sensor		
	P1550, P1551, P1552, P1553, P1554	Battery current sensor		
	P1556, P1557	Battery temperature sensor		
	P1610 - P1615	NATS		
	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	Heated oxygen sensor 2 heater		
	P0075, P0081	Intake valve timing control solenoid valve/Intake valve timing intermediate lock control solenoid valve		
	P0078, P0084	Exhaust valve timing control solenoid valve		
	P0130, P0131, P0132, P014C, P014D, P014E, P014F, 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		
	P0447, P0448	EVAP canister vent control valve		
	P0451, P0452, P0453	EVAP control system pressure sensor		
	P1217	Engine over temperature (OVERHEAT)		
	P1800, P1801	VIAS control solenoid valve		
	P1805	Brake switch		
	P2100, P2103	Throttle control motor relay		
	P2101	Electric throttle control function		
	P2118	Throttle control motor		

< ECU DIAGNOSIS INFORMATION >

Priority	Detected items (DTC)	Detected items (DTC)	
3	P0011, P0021, P052A, P052B, P052C, P052D	Intake valve timing control	A
	P0014, P0024	Exhaust valve timing control	
	P0171, P0172, P0174, P0175	Fuel injection system function	EC
	P0300 - P0306	Misfire	
	P0420, P0430	Three way catalyst function	
	P0456	EVAP control system (VERY SMALL LEAK)	С
	P0506, P0507	Idle speed control system	
	P050A, P050E	Cold start control	D
	P0524	Engine oil pressure	
	P1148, P1168	Closed loop control	
	P1212	TCS communication line	E
	P1564	ASCD steering switch / ICC steering switch	
	P1568	ICC function	E
	P1572	Brake pedal position switch	I
	P1574	ASCD vehicle speed sensor / ICC vehicle speed sensor	
	P1715	Primary speed sensor	G
	P2119	Electric throttle control actuator	
	P219A, P219B	Air fuel ratio (A/F) sensor 1	U

DTC Index

INFOID:000000011939694

EXCEPT FOR MEXICO

×:Applicable —: Not applicable

DTO	C*1	Items	SRT			Permanent	Reference	
CONSULT GST ^{*2}	ECM ^{*3}	(CONSULT screen terms)	code	Trip	MIL	DTC group ^{*4}	page	J
U0101	0101 ^{*5}	LOST COMM (TCM)	_	1	×	В	<u>EC-194</u>	K
U1000	1000 ^{*5}	CAN COMM CIRCUIT	_	2		_	<u>EC-195</u>	-
U1001	1001 ^{*5}	CAN COMM CIRCUIT	_	1	_	_	<u>EC-196</u>	
P0000	0000	NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED.	_	_	Blinking ^{*6}	_	_	- L
P0011	0011	INT/V TIM CONT-B1	×	2	×	В	<u>EC-197</u>	N
P0014	0014	EXH/V TIM CONT-B1	_	2	×	В	EC-201	-
P0021	0021	INT/V TIM CONT-B2	×	2	×	В	<u>EC-197</u>	N
P0024	0024	EXH/V TIM CONT-B2	_	2	×	В	EC-201	-
P0030	0030	A/F SEN1 HTR (B1)	_	2	×	В	<u>EC-207</u>	-
P0031	0031	A/F SEN1 HTR (B1)	_	2	×	В	EC-207	0
P0032	0032	A/F SEN1 HTR (B1)	_	2	×	В	<u>EC-207</u>	-
P0036	0036	A/F SEN1 HTR (B2)	_	2	×	В	<u>EC-207</u>	F
P0037	0037	HO2S2 HTR (B1)	_	2	×	В	<u>EC-210</u>	
P0038	0038	HO2S2 HTR (B1)	_	2	×	В	<u>EC-210</u>	-
P0051	0051	A/F SEN1 HTR (B2)	—	2	×	В	EC-207	-
P0052	0052	A/F SEN1 HTR (B2)	-	2	×	В	EC-207	-
P0057	0057	HO2S2 HTR (B2)	-	2	×	В	EC-210	-
P0058	0058	HO2S2 HTR (B2)	-	2	×	В	<u>EC-210</u>	-

< ECU DIAGNOSIS INFORMATION >

DTC ^{*1}		lite and	ODT			Permanent	Deferrere
CONSULT GST ^{*2}	ECM ^{*3}	Items (CONSULT screen terms)	SRT code	Trip	MIL	DTC group ^{*4}	Reference page
P0075	0075	INT/V TIM V/CIR-B1	_	2	×	В	<u>EC-213</u>
P0078	0078	EX V/T ACT/CIRC-B1	_	2	×	В	<u>EC-213</u>
P0081	0081	INT/V TIM V/CIR-B2		2	×	В	EC-213
P0084	0084	EX V/T ACT/CIRC-B2	_	2	×	В	<u>EC-218</u>
P0101	0101	MAF SEN/CIRCUIT-B1		2	×	В	<u>EC-221</u>
P0102	0102	MAF SEN/CIRCUIT-B1	_	1	×	В	<u>EC-226</u>
P0103	0103	MAF SEN/CIRCUIT-B1	_	1	×	В	EC-226
P0111	0111	IAT SENSOR 1 B1		2	×	А	<u>EC-232</u>
P0112	0112	IAT SEN/CIRCUIT-B1		2	×	В	EC-234
P0113	0113	IAT SEN/CIRCUIT-B1	_	2	×	В	<u>EC-234</u>
P0116	0116	ECT SEN/CIRC	_	2	×	А	EC-236
P0117	0117	ECT SEN/CIRC	_	1	×	В	EC-238
P0118	0118	ECT SEN/CIRC		1	×	В	EC-238
P0122	0122	TP SEN 2/CIRC-B1	_	1	×	В	EC-241
P0123	0123	TP SEN 2/CIRC-B1		1	×	В	<u>EC-241</u>
P0125	0125	ECT SENSOR		2	×	В	<u>EC-244</u>
P0127	0127	IAT SENSOR-B1		2	×	В	<u>EC-247</u>
P0128	0128	THERMSTAT FNCTN		2	×	А	<u>EC-249</u>
P0130	0130	A/F SENSOR1 (B1)	_	2	×	А	<u>EC-252</u>
P0131	0131	A/F SENSOR1 (B1)		2	×	В	<u>EC-256</u>
P0132	0132	A/F SENSOR1 (B1)		2	×	В	EC-259
P0137	0137	HO2S2 (B1)	×	2	×	Α	EC-262
P0138	0138	HO2S2 (B1)	×	2	×	Α	EC-268
P0139	0139	HO2S2 (B1)	×	2	×	А	<u>EC-276</u>
P014C	014C	A/F SENSOR1 (B1)	×	2	×	Α	EC-282
P014D	014D	A/F SENSOR1 (B1)	×	2	×	Α	<u>EC-282</u>
P014E	014E	A/F SENSOR1 (B2)	×	2	×	Α	<u>EC-282</u>
P014F	014F	A/F SENSOR1 (B2)	×	2	×	Α	<u>EC-282</u>
P0150	0150	A/F SENSOR1 (B2)	_	2	×	А	<u>EC-252</u>
P0151	0151	A/F SENSOR1 (B2)	_	2	×	В	<u>EC-256</u>
P0152	0152	A/F SENSOR1 (B2)	_	2	×	В	<u>EC-259</u>
P0157	0157	HO2S2 (B2)	×	2	×	А	<u>EC-262</u>
P0158	0158	HO2S2 (B2)	×	2	×	A	<u>EC-268</u>
P0159	0159	HO2S2 (B2)	×	2	×	А	<u>EC-276</u>
P015A	015A	A/F SENSOR1 (B1)	×	2	×	А	<u>EC-282</u>
P015B	015B	A/F SENSOR1 (B1)	×	2	×	А	<u>EC-282</u>
P015C	015C	A/F SENSOR1 (B2)	×	2	×	А	<u>EC-282</u>
P015D	015D	A/F SENSOR1 (B2)	×	2	×	A	EC-282
P0171	0171	FUEL SYS-LEAN-B1		2	×	В	EC-289
P0172	0172	FUEL SYS-RICH-B1	—	2	×	В	EC-294
P0174	0174	FUEL SYS-LEAN-B2		2	×	В	EC-289
P0175	0175	FUEL SYS-RICH-B2	—	2	×	В	<u>EC-294</u>

< ECU DIAGNOSIS INFORMATION >

[VQ35DE]

DTC	C*1		0.77			Dermanant	- <i>i</i>	_
CONSULT GST ^{*2}	ECM ^{*3}	Items (CONSULT screen terms)	SRT code	Trip	MIL	Permanent DTC group ^{*4}	Reference page	A
P0181	0181	FTT SENSOR	—	2	×	A and B	EC-299	EC
P0182	0182	FTT SEN/CIRCUIT	_	2	×	В	<u>EC-303</u>	
P0183	0183	FTT SEN/CIRCUIT	_	2	×	В	<u>EC-303</u>	_
P0196	0196	EOT SENSOR		2	×	A and B	<u>EC-306</u>	С
P0197	0197	EOT SEN/CIRC	_	2	×	В	<u>EC-310</u>	
P0198	0198	EOT SEN/CIRC		2	×	В	<u>EC-310</u>	D
P0222	0222	TP SEN 1/CIRC-B1	_	1	×	В	<u>EC-312</u>	_
P0223	0223	TP SEN 1/CIRC-B1	—	1	×	В	<u>EC-312</u>	_
P0300	0300	MULTI CYL MISFIRE	_	1 or 2	×	В	<u>EC-315</u>	E
P0301	0301	CYL 1 MISFIRE	_	1 or 2	×	В	<u>EC-315</u>	
P0302	0302	CYL 2 MISFIRE	_	1 or 2	×	В	<u>EC-315</u>	F
P0303	0303	CYL 3 MISFIRE	_	1 or 2	×	В	<u>EC-315</u>	
P0304	0304	CYL 4 MISFIRE	_	1 or 2	×	В	<u>EC-315</u>	-
P0305	0305	CYL 5 MISFIRE	_	1 or 2	×	В	<u>EC-315</u>	G
P0306	0306	CYL 6 MISFIRE	_	1 or 2	×	В	<u>EC-315</u>	-
P0327	0327	KNOCK SEN/CIRC-B1	—	2	—	—	<u>EC-323</u>	
P0328	0328	KNOCK SEN/CIRC-B1	_	2	—	—	EC-323	H
P0332	0332	KNOCK SEN/CIRC-B2	_	2	—	—	EC-323	-
P0333	0333	KNOCK SEN/CIRC-B2	—	2	—	_	EC-323	
P0335	0335	CKP SEN/CIRCUIT	—	2	×	В	EC-326	-
P0340	0340	CMP SEN/CIRC-B1	—	2	×	В	EC-330	-
P0345	0345	CMP SEN/CIRC-B2	_	2	×	В	EC-330	J
P0420	0420	TW CATALYST SYS-B1	×	2	×	А	<u>EC-335</u>	-
P0430	0430	TW CATALYST SYS-B2	×	2	×	A	<u>EC-335</u>	K
P0441	0441	EVAP PURG FLOW/MON	×	2	×	А	<u>EC-341</u>	-
P0443	0443	PURG VOLUME CONT/V	—	2	×	А	<u>EC-347</u>	-
P0444	0444	PURG VOLUME CONT/V	_	2	×	В	<u>EC-352</u>	L
P0445	0445	PURG VOLUME CONT/V	_	2	×	В	<u>EC-352</u>	-
P0447	0447	VENT CONTROL VALVE	_	2	×	В	<u>EC-355</u>	M
P0448	0448	VENT CONTROL VALVE	_	2	×	В	<u>EC-359</u>	
P0451	0451	EVAP SYS PRES SEN		2	×	А	<u>EC-363</u>	-
P0452	0452	EVAP SYS PRES SEN	_	2	×	В	<u>EC-367</u>	Ν
P0453	0453	EVAP SYS PRES SEN		2	×	В	<u>EC-370</u>	
P0456	0456	EVAP VERY SML LEAK	×*7	2	×	А	<u>EC-374</u>	0
P0460	0460	FUEL LEV SEN SLOSH	_	2	×	А	<u>EC-380</u>	0
P0461	0461	FUEL LEVEL SENSOR	_	2	×	В	EC-382	-
P0462	0462	FUEL LEVL SEN/CIRC	_	2	×	В	<u>EC-384</u>	Р
P0463	0463	FUEL LEVL SEN/CIRC	_	2	×	В	<u>EC-384</u>	-
P0500	0500	VEH SPEED SEN/CIRC*8	_	2	×	В	<u>EC-386</u>	-
P0506	0506	ISC SYSTEM	_	2	×	В	<u>EC-389</u>	-
P0507	0507	ISC SYSTEM		2	×	В	EC-391	-
P050A	050A	COLD START CONTROL	_	2	×	A	<u>EC-393</u>	-
				_				-

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< ECU DIAGNOSIS INFORMATION >

DT	C ^{*1}	Items	SRT			Permanent	Reference
CONSULT GST ^{*2}	ECM ^{*3}	(CONSULT screen terms)	code	Trip	MIL	DTC group ^{*4}	page
P050E	050E	COLD START CONTROL	—	2	×	А	<u>EC-393</u>
P0520	0520	EOP SENSOR/SWITCH	—	2	-	—	<u>EC-396</u>
P0524	0524	ENGINE OIL PRESSURE	_	1	_	—	EC-400
P052A	052A	CAMSHAFT POSITION TIM- ING B1	×	2	×	В	<u>EC-404</u>
P052B	052B	CAMSHAFT POSITION TIM- ING B1	×	2	×	В	<u>EC-404</u>
P052C	052C	CAMSHAFT POSITION TIM- ING B2	×	2	×	В	<u>EC-404</u>
P052D	052D	CAMSHAFT POSITION TIM- ING B2	×	2	×	В	<u>EC-404</u>
P0603	0603	ECM BACK UP/CIRCUIT	_	2	×	В	<u>EC-411</u>
P0604	0604	ECM	_	1	×	В	<u>EC-413</u>
P0605	0605	ECM	_	1 or 2	×	В	EC-415
P0606	0606	CONTROL MODULE	_	1	× or —	В	<u>EC-417</u>
P0607	0607	ECM	_	1 or 2	× or —	В	<u>EC-419</u>
P060A	060A	CONTROL MODULE	_	1	×	В	<u>EC-420</u>
P060B	060B	CONTROL MODULE		1	×	В	<u>EC-422</u>
P062F	062F	CONTROL MODULE	_	1	×	В	<u>EC-411</u>
P0643	0643	SENSOR POWER/CIRC		1	×	В	<u>EC-424</u>
P0850	0850	P-N POS SW/CIRCUIT		2	×	В	EC-427
P1078	1078	EXH TIM SEN/CIRC-B1		2	×	В	EC-430
P1084	1084	EXH TIM SEN/CIRC-B2		2	×	В	EC-430
P1148	1148	CLOSED LOOP-B1		1	×	A	<u>EC-434</u>
P1168	1168	CLOSED LOOP-B2		1	×	A	<u>EC-434</u>
P1212	1212	TCS/CIRC		2		_	<u>EC-435</u>
P1217	1217	ENG OVER TEMP		1	×	В	EC-437
P1225	1225	CTP LEARNING-B1		2	_	_	<u>EC-440</u>
P1226	1226	CTP LEARNING-B1		2	_	_	<u>EC-442</u>
P1550	1550	BAT CURRENT SENSOR		2	_	_	<u>EC-444</u>
P1551	1551	BAT CURRENT SENSOR		2	_	_	<u>EC-447</u>
P1552	1552	BAT CURRENT SENSOR		2	_	_	<u>EC-447</u>
P1553	1553	BAT CURRENT SENSOR		2	_	_	<u>EC-450</u>
P1554	1554	BAT CURRENT SENSOR		2	_	_	EC-453
P1556	1556	BAT TMP SEN/CIRC	_	2	_	_	<u>EC-456</u>
P1557	1557	BAT TMP SEN/CIRC	_	2	_	_	<u>EC-456</u>
P1564	1564	ASCD SW	_	1		_	<u>EC-459</u> (With ASCD) <u>EC-462</u> (With ICC)
P1568	1568	ICC COMMAND VALUE		1		_	<u>EC-465</u>
P1572	1572	ASCD BRAKE SW	_	1	_	_	<u>EC-467</u> (With ASCD) <u>EC-475</u> (With ICC)

< ECU DIAGNOSIS INFORMATION >

[VQ35DE]

DTC	C*1	Items	SRT			Permanent	Reference	
CONSULT GST ^{*2}	ECM ^{*3}	(CONSULT screen terms)	code	Trip	MIL	DTC group ^{*4}	page	
P1574	1574	ASCD VHL SPD SEN	_	1	_	_	<u>EC-482</u> (With ASCD) <u>EC-484</u> (With ICC)	
P1610	1610	LOCK MODE	_	2	_	—	<u>SEC-58</u>	
P1611	1611	ID DISCORD, IMM-ECM		2	_	—	<u>SEC-60</u>	
P1612	1612	CHAIN OF ECM-IMMU	_	2	_	_	<u>SEC-62</u>	
P1615	1615	DIFFERENCE OF KEY	_	2	_	_	<u>SEC-64</u>	
P1800	1800	VIAS S/V CIRC-B1	_	2	_	_	<u>EC-487</u>	
P1801	1801	VIAS S/V CIRC-B2	_	2	_	_	<u>EC-490</u>	
P1805	1805	BRAKE SW/CIRCUIT	_	2	_	_	<u>EC-493</u>	
P2096	2096	POST CAT FUEL TRIM SYS B1	_	2	×	А	<u>EC-497</u>	
P2097	2097	POST CAT FUEL TRIM SYS B1	_	2	×	А	<u>EC-497</u>	
P2098	2098	POST CAT FUEL TRIM SYS B2	_	2	×	А	<u>EC-497</u>	
P2099	2099	POST CAT FUEL TRIM SYS B2	_	2	×	А	<u>EC-497</u>	
P2100	2100	ETC MOT PWR-B1	_	1	×	В	<u>EC-502</u>	
P2101	2101	ETC FNCTN/CIRC-B1	_	1	×	В	<u>EC-504</u>	
P2103	2103	ETC MOT PWR-B1	_	1	×	В	<u>EC-502</u>	
P2118	2118	ETC MOT-B1		1	×	В	<u>EC-507</u>	
P2119	2119	ETC ACTR-B1	_	1	×	В	<u>EC-509</u>	
P2122	2122	APP SEN 1/CIRC	_	1	×	В	<u>EC-511</u>	
P2123	2123	APP SEN 1/CIRC	_	1	×	В	<u>EC-511</u>	
P2127	2127	APP SEN 2/CIRC	_	1	×	В	<u>EC-514</u>	
P2128	2128	APP SEN 2/CIRC	—	1	×	В	<u>EC-514</u>	
P2135	2135	TP SENSOR-B1	—	1	×	В	<u>EC-518</u>	
P2138	2138	APP SENSOR	—	1	×	В	<u>EC-521</u>	
P219A	219A	AIR FUEL RATIO IMBAL- ANCE B1	_	2	×	А	<u>EC-525</u>	
P219B	219B	AIR FUEL RATIO IMBAL- ANCE B2	_	2	×	A	<u>EC-525</u>	
P2610	2610	ECM/PCM INTERNAL ENG OFF TIMER	_	2	×	A and B	<u>EC-531</u>	

*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-176, "Description".

*5: The troubleshooting for this DTC needs CONSULT.

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

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

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

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

FOR MEXICO

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< ECU DIAGNOSIS INFORMATION >

[VQ35DE]

×:Applicable —: Not applicable

DTC	* 1	Items					
CONSULT GST ^{*2}	ECM ^{*3}	(CONSULT screen terms)	SRT code	Trip	MIL	Reference page	
U0101	0101 ^{*4}	LOST COMM (TCM)	_	1	×	<u>EC-194</u>	
U1000	1000 ^{*4}	CAN COMM CIRCUIT	_	2	_	<u>EC-195</u>	
U1001	1001 ^{*4}	CAN COMM CIRCUIT	_	1		<u>EC-196</u>	
P0000	0000	NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED.	_	_	Blinking ^{*5}	_	
P0011	0011	INT/V TIM CONT-B1	×	2	×	<u>EC-197</u>	
P0014	0014	EXH/V TIM CONT-B1	_	2	×	<u>EC-201</u>	
P0021	0021	INT/V TIM CONT-B2	×	2	×	<u>EC-197</u>	
P0024	0024	EXH/V TIM CONT-B2	_	2	×	<u>EC-201</u>	
P0031	0031	A/F SEN1 HTR (B1)	_	2	×	<u>EC-207</u>	
P0032	0032	A/F SEN1 HTR (B1)	_	2	×	EC-207	
P0037	0037	HO2S2 HTR (B1)	_	2	×	<u>EC-210</u>	
P0038	0038	HO2S2 HTR (B1)	_	2	×	<u>EC-210</u>	
P0051	0051	A/F SEN1 HTR (B2)	_	2	×	<u>EC-207</u>	
P0052	0052	A/F SEN1 HTR (B2)	_	2	×	<u>EC-207</u>	
P0057	0057	HO2S2 HTR (B2)	_	2	×	<u>EC-210</u>	
P0058	0058	HO2S2 HTR (B2)	_	2	×	<u>EC-210</u>	
P0075	0075	INT/V TIM V/CIR-B1	_	2	×	EC-213	
P0078	0078	EX V/T ACT/CIRC-B1	_	2	×	EC-213	
P0081	0081	INT/V TIM V/CIR-B2	_	2	×	EC-213	
P0084	0084	EX V/T ACT/CIRC-B2	_	2	×	<u>EC-218</u>	
P0102	0102	MAF SEN/CIRCUIT-B1	_	1	×	<u>EC-226</u>	
P0103	0103	MAF SEN/CIRCUIT-B1	_	1	×	<u>EC-226</u>	
P0112	0112	IAT SEN/CIRCUIT-B1	_	2	×	<u>EC-234</u>	
P0113	0113	IAT SEN/CIRCUIT-B1	_	2	×	<u>EC-234</u>	
P0117	0117	ECT SEN/CIRC	_	1	×	<u>EC-238</u>	
P0118	0118	ECT SEN/CIRC	_	1	×	<u>EC-238</u>	
P0122	0122	TP SEN 2/CIRC-B1	_	1	×	<u>EC-241</u>	
P0123	0123	TP SEN 2/CIRC-B1	_	1	×	<u>EC-241</u>	
P0130	0130	A/F SENSOR1 (B1)	_	2	×	EC-252	
P0131	0131	A/F SENSOR1 (B1)	_	2	×	<u>EC-256</u>	
P0132	0132	A/F SENSOR1 (B1)	_	2	×	<u>EC-259</u>	
P0137	0137	HO2S2 (B1)	×	2	×	<u>EC-262</u>	
P0138	0138	HO2S2 (B1)	×	2	×	EC-268	
P0139	0139	HO2S2 (B1)	×	2	×	EC-276	
P014C	014C	A/F SENSOR1 (B1)	×	2	×	EC-282	
P014D	014D	A/F SENSOR1 (B1)	×	2	×	<u>EC-282</u>	
P014E	014E	A/F SENSOR1 (B2)	×	2	×	EC-282	
P014F	014F	A/F SENSOR1 (B2)	×	2	×	EC-282	
P0150	0150	A/F SENSOR1 (B2)	_	2	×	EC-252	
P0151	0151	A/F SENSOR1 (B2)		2	×	<u>EC-256</u>	

< ECU DIAGNOSIS INFORMATION >

[VQ35DE]

CONSULT	ECM ^{*3}	- Items		Trim			А
GST ^{*2}		(CONSULT screen terms)	SRT code	Trip	MIL	Reference page	A
P0152	0152	A/F SENSOR1 (B2)	_	2	×	<u>EC-259</u>	EC
P0157	0157	HO2S2 (B2)	×	2	×	<u>EC-262</u>	
P0158	0158	HO2S2 (B2)	×	2	×	<u>EC-268</u>	
P0159	0159	HO2S2 (B2)	×	2	×	<u>EC-276</u>	С
P0171	0171	FUEL SYS-LEAN-B1	_	2	×	<u>EC-289</u>	
P0172	0172	FUEL SYS-RICH-B1	_	2	×	<u>EC-294</u>	D
P0174	0174	FUEL SYS-LEAN-B2	_	2	×	<u>EC-289</u>	
P0175	0175	FUEL SYS-RICH-B2	_	2	×	<u>EC-294</u>	
P0182	0182	FTT SEN/CIRCUIT	_	2	×	<u>EC-303</u>	E
P0183	0183	FTT SEN/CIRCUIT	_	2	×	<u>EC-303</u>	
P0196	0196	EOT SENSOR	_	2	×	EC-306	F
P0197	0197	EOT SEN/CIRC	_	2	×	<u>EC-310</u>	
P0198	0198	EOT SEN/CIRC	_	2	×	<u>EC-310</u>	
P0222	0222	TP SEN 1/CIRC-B1	_	1	×	<u>EC-312</u>	G
P0223	0223	TP SEN 1/CIRC-B1	_	1	×	EC-312	
P0300	0300	MULTI CYL MISFIRE	_	1 or 2	×	<u>EC-315</u>	
P0301	0301	CYL 1 MISFIRE	_	1 or 2	×	EC-315	Н
P0302	0302	CYL 2 MISFIRE	_	1 or 2	×	EC-315	
P0303	0303	CYL 3 MISFIRE	_	1 or 2	×	<u>EC-315</u>	
P0304	0304	CYL 4 MISFIRE	_	1 or 2	×	EC-315	
P0305	0305	CYL 5 MISFIRE	_	1 or 2	×	EC-315	
P0306	0306	CYL 6 MISFIRE	_	1 or 2	×	<u>EC-315</u>	J
P0327	0327	KNOCK SEN/CIRC-B1	_	2	—	<u>EC-323</u>	
P0328	0328	KNOCK SEN/CIRC-B1	_	2	—	<u>EC-323</u>	K
P0332	0332	KNOCK SEN/CIRC-B2	_	2	—	EC-323	
P0333	0333	KNOCK SEN/CIRC-B2	_	2	—	<u>EC-323</u>	
P0335	0335	CKP SEN/CIRCUIT	_	2	×	<u>EC-326</u>	L
P0340	0340	CMP SEN/CIRC-B1	_	2	×	<u>EC-330</u>	
P0345	0345	CMP SEN/CIRC-B2		2	×	<u>EC-330</u>	Μ
P0420	0420	TW CATALYST SYS-B1	×	2	×	<u>EC-335</u>	
P0430	0430	TW CATALYST SYS-B2	×	2	×	<u>EC-335</u>	
P0444	0444	PURG VOLUME CONT/V		2	×	<u>EC-352</u>	Ν
P0452	0452	EVAP SYS PRES SEN		2	×	<u>EC-367</u>	
P0453	0453	EVAP SYS PRES SEN	_	2	×	<u>EC-370</u>	0
P0462	0462	FUEL LEVL SEN/CIRC		2	×	<u>EC-384</u>	0
P0463	0463	FUEL LEVL SEN/CIRC	_	2	×	<u>EC-384</u>	
P0500	0500	VEH SPEED SEN/CIRC*7	_	2	×	<u>EC-386</u>	Ρ
P0520	0520	EOP SENSOR/SWITCH		2	_	<u>EC-396</u>	
P0524	0524	ENGINE OIL PRESSURE		1		<u>EC-400</u>	
P052A	052A	CAMSHAFT POSITION TIMING B1	×	2	×	<u>EC-404</u>	
P052B	052B	CAMSHAFT POSITION TIMING B1	x	2	×	<u>EC-404</u>	

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< ECU DIAGNOSIS INFORMATION >

DT	C ^{*1}					
CONSULT GST ^{*2}	ECM ^{*3}	Items (CONSULT screen terms)	SRT code	Trip	MIL	Reference page
P052C	052C	CAMSHAFT POSITION TIMING B2	×	2	×	<u>EC-404</u>
P052D	052D	CAMSHAFT POSITION TIMING B2	×	2	×	<u>EC-404</u>
P0603	0603	ECM BACK UP/CIRCUIT	—	2	×	<u>EC-411</u>
P0604	0604	ECM	_	1	×	EC-413
P0605	0605	ECM	_	1 or 2	×	<u>EC-415</u>
P0606	0606	CONTROL MODULE	—	1	× or —	<u>EC-417</u>
P0607	0607	ECM	_	1 or 2	× or —	<u>EC-419</u>
P060A	060A	CONTROL MODULE	—	1	×	<u>EC-420</u>
P060B	060B	CONTROL MODULE	—	1	×	<u>EC-422</u>
P062F	062F	CONTROL MODULE	—	1	х	<u>EC-411</u>
P0643	0643	SENSOR POWER/CIRC	—	1	х	<u>EC-424</u>
P0850	0850	P-N POS SW/CIRCUIT	_	2	×	<u>EC-427</u>
P1078	1078	EXH TIM SEN/CIRC-B1	_	2	×	<u>EC-430</u>
P1084	1084	EXH TIM SEN/CIRC-B2		2	×	<u>EC-430</u>
P1212	1212	TCS/CIRC		2	_	EC-435
P1217	1217	ENG OVER TEMP	_	1	×	<u>EC-437</u>
P1225	1225	CTP LEARNING-B1	_	2	_	<u>EC-440</u>
P1226	1226	CTP LEARNING-B1	_	2	_	EC-442
P1550	1550	BAT CURRENT SENSOR	_	2	_	<u>EC-444</u>
P1551	1551	BAT CURRENT SENSOR	_	2	_	<u>EC-447</u>
P1552	1552	BAT CURRENT SENSOR	_	2	_	<u>EC-447</u>
P1553	1553	BAT CURRENT SENSOR	_	2	_	<u>EC-450</u>
P1554	1554	BAT CURRENT SENSOR	_	2	_	EC-453
P1556	1556	BAT TMP SEN/CIRC		2		<u>EC-456</u>
P1557	1557	BAT TMP SEN/CIRC	_	2	_	<u>EC-456</u>
P1564	1564	ASCD SW	_	1	_	<u>EC-459</u> (With ASCD) <u>EC-462</u> (With ICC)
P1568	1568	ICC COMMAND VALUE	_	1	—	<u>EC-465</u>
P1572	1572	ASCD BRAKE SW	_	1	_	<u>EC-467</u> (With ASCD) <u>EC-475</u> (With ICC)
P1574	1574	ASCD VHL SPD SEN	_	1	_	<u>EC-482</u> (With ASCD) <u>EC-484</u> (With ICC)
P1610	1610	LOCK MODE	_	2	—	<u>SEC-58</u>
P1611	1611	ID DISCORD, IMM-ECM	—	2	—	<u>SEC-60</u>
P1612	1612	CHAIN OF ECM-IMMU		2	_	<u>SEC-62</u>
P1615	1615	DIFFERENCE OF KEY		2		<u>SEC-64</u>
P1800	1800	VIAS S/V CIRC-B1	—	2	—	<u>EC-487</u>
P1801	1801	VIAS S/V CIRC-B2		2	_	<u>EC-490</u>

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< ECU DIAGNOSIS INFORMATION >

DT	C*1	ltomo					А
CONSULT GST ^{*2}	ECM ^{*3}	 Items (CONSULT screen terms) 	SRT code	Trip	MIL	Reference page	A
P1805	1805	BRAKE SW/CIRCUIT	_	2		<u>EC-493</u>	EC
P2100	2100	ETC MOT PWR-B1	—	1	×	<u>EC-502</u>	
P2101	2101	ETC FNCTN/CIRC-B1	—	1	×	<u>EC-504</u>	
P2103	2103	ETC MOT PWR-B1	—	1	×	<u>EC-502</u>	С
P2118	2118	ETC MOT-B1	_	1	×	<u>EC-507</u>	
P2119	2119	ETC ACTR-B1	—	1	×	<u>EC-509</u>	D
P2122	2122	APP SEN 1/CIRC	—	1	×	<u>EC-511</u>	D
P2123	2123	APP SEN 1/CIRC	—	1	×	<u>EC-511</u>	
P2127	2127	APP SEN 2/CIRC	_	1	×	<u>EC-514</u>	E
P2128	2128	APP SEN 2/CIRC	—	1	×	<u>EC-514</u>	
P2135	2135	TP SENSOR-B1	—	1	×	<u>EC-518</u>	E
P2138	2138	APP SENSOR	_	1	×	<u>EC-521</u>	Γ

*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: The troubleshooting for this DTC needs CONSULT.

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

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

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

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

Test Value and Test Limit

INFOID:000000012375598

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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< ECU DIAGNOSIS INFORMATION >

Item	OBD-	Self-diagnostic test item	DTC	lii	e and Test mit display)	Description
	MID			TID	Unitand Scaling ID	
			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)
		Air fuel ratio (A/F) sensor 1 (Bank 1)	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		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 >

	OBD-			li	e and Test mit display)			
Item	MID	Self-diagnostic test item	DTC	TID	Unitand Scaling ID	Description		
			P0138	07H	0CH	Minimum sensor output voltage for test cycle		
	02H	Heated oxygen sensor 2	P0137	08H	0CH	Maximum sensor output voltage for test cycle		
		(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		
			P0146	80H	0CH	Sensor output voltage		
			P0145	81H	0CH	Difference in sensor output voltage		
			P0151	83H	0BH	Minimum sensor output voltage for test cycle		
		Air fuel ratio (A/F) sensor 1			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		
HO2S				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	(Bank 2)	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
			P0163	07H	0CH	Minimum sensor output voltage for test cycle
	07H	Heated oxygen sensor 3 (Bank2)	P0164	08H	0CH	Maximum sensor output voltage for test cycle
			P0166	80H	0CH	Sensor output voltage
			P0165	81H	0CH	Difference in sensor output voltage
			P0420	80H	01H	O2 storage index
	21H	Three way catalyst function (Bank1)	P0420	82H	01H	Switching time lag engine exhaust in- dex value
	2111		P2423	83H	0CH	Difference in 3rd O2 sensor output voltage
CATA-			P2423	84H	84H	O2 storage index in HC trap catalyst
LYST			P0430	80H	01H	O2 storage index
	22H	Three way catalyst function	P0430	82H	01H	Switching time lag engine exhaust in- dex value
	2211	(Bank2)	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 >

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Item	OBD- MID	Self-diagnostic test item	DTC	(GST TID	display) Unitand Scaling ID	Description	EC
			P0011	80H	9DH	VTC intake function diagnosis (VTC alignment check diagnosis)	
			P0014	81H	9DH	VTC exhaust function diagnosis (VTC alignment check diagnosis)	<u> </u>
			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
	351		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
			P0024	81H	9DH	VTC exhaust function diagnosis (VTC alignment check diagnosis)	
		VVT Monitor (Bank2)	P0021	82H	9DH	VTC intake function diagnosis (VTC drive failure diagnosis)	I
	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	M
	3BH	EVAP control system leak (Small leak)	P0442	80H	05H	Leak area index (for more than 0.04 inch)	N
			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	P
	3DH	Purge flow system	P0441	83H	0CH	Difference in pressure sensor output voltage before and after vent control valve close	_

< ECU DIAGNOSIS INFORMATION >

	OBD-			lir	e and Test nit display)	Description
ltem	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
	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
O2 SEN- SOR	43H	Heated oxygen sensor 3 heat- er (Bank 1)	P0043	80H	0CH	Converted value of heater electric cur- rent to voltage
HEATER	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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Item	OBD-	Self-diagnostic test item	DTC	(GST	display)	Description	
	MID			TID	Unitand Scaling ID		EC
			P0171 or P0172	80H	2FH	Long term fuel trim	-
			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
FUEL			P21A0	87H	83H	Air-fuel ratio cylinder imbalance diag- nosis CPS (Crankshaft Position Sen- sor) method #5 cylinder parameter	Н
SYSTEM			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 >

Item	OBD- MID	Self-diagnostic test item	DTC	lir	e and Test mit display) Unitand Scaling	Description
			P0301	80H	ID 24H	Misfiring counter at 1000 revolution of the first cylinder
			P0302	81H	24H	Misfiring counter at 1000 revolution of the second cylinder
			P0303	82H	24H	Misfiring counter at 1000 revolution of the third cylinder
			P0304	83H	24H	Misfiring counter at 1000 revolution of the fourth cylinder
			P0305	84H	24H	Misfiring counter at 1000 revolution of the fifth cylinder
			P0306	85H	24H	Misfiring counter at 1000 revolution of the sixth cylinder
			P0307	86H	24H	Misfiring counter at 1000 revolution of the seventh cylinder
			P0308	87H	24H	Misfiring counter at 1000 revolution of the eighth cylinder
			P0300	88H	24H	Misfiring counter at 1000 revolution of the multiple cylinders
MICEIDE			P0301	89H	24H	Misfiring counter at 200 revolution of the first cylinder
MISFIRE	A1H	Multiple cylinder misfires	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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					e and Test mit	
Item	OBD-	Self-diagnostic test item	DTC	(GST	display)	Description
	MID			TID	Unitand Scaling ID	Doonpion
	A2H	No. 1 cylinder misfire	P0301	0ВН	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	0ВН	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	No. 3 cylinder misfire	P0303	ОВН	24H	EWMA (Exponential Weighted Moving Average) misfire counts for last 10 driv- ing cycles
			P0303	0CH	24H	Misfire counts for last/current driving cycles
	A5H	No. 4 cylinder misfire	P0304	0ВН	24H	EWMA (Exponential Weighted Moving Average) misfire counts for last 10 driv- ing cycles
MISFIRE			P0304	0CH	24H	Misfire counts for last/current driving cycles
MISFIRE	A6H	No. 5 cylinder misfire	P0305	0ВН	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	0BH	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	P0307	0ВН	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	0ВН	24H	EWMA (Exponential Weighted Moving Average) misfire counts for last 10 driv- ing cycles
			P0308	0CH	24H	Misfire counts for last/current driving cycles

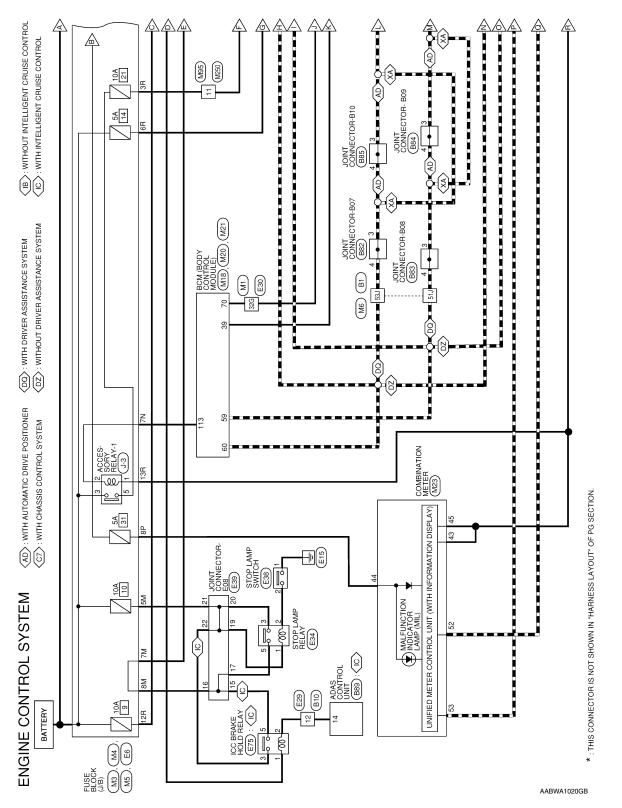
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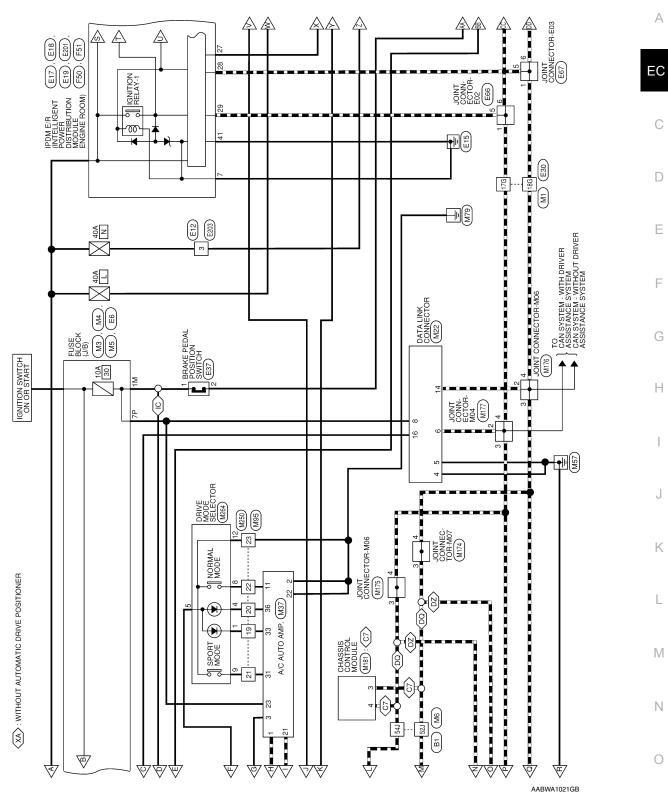
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WIRING DIAGRAM ENGINE CONTROL SYSTEM

Wiring Diagram

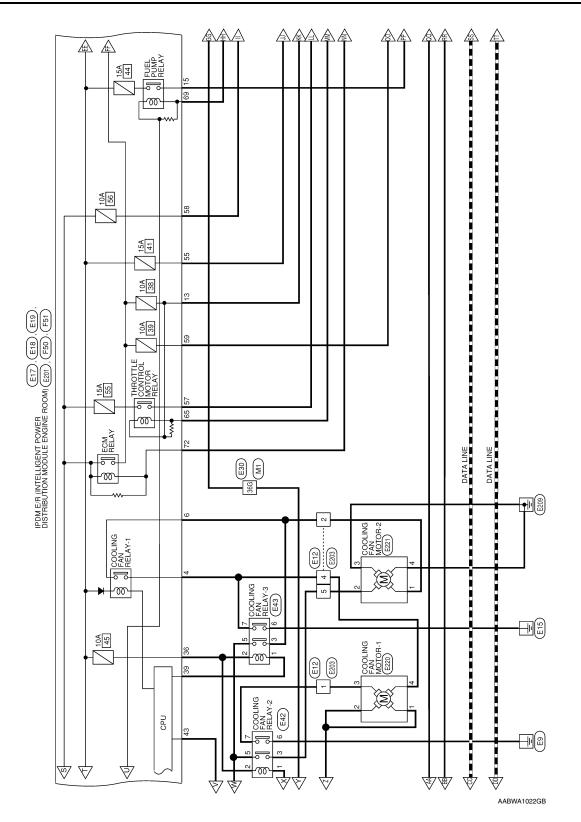


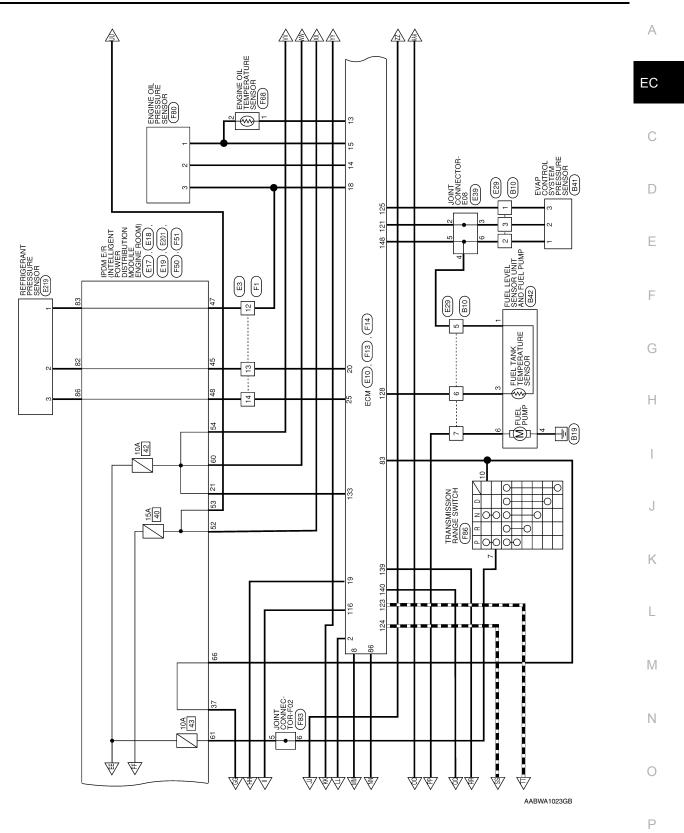
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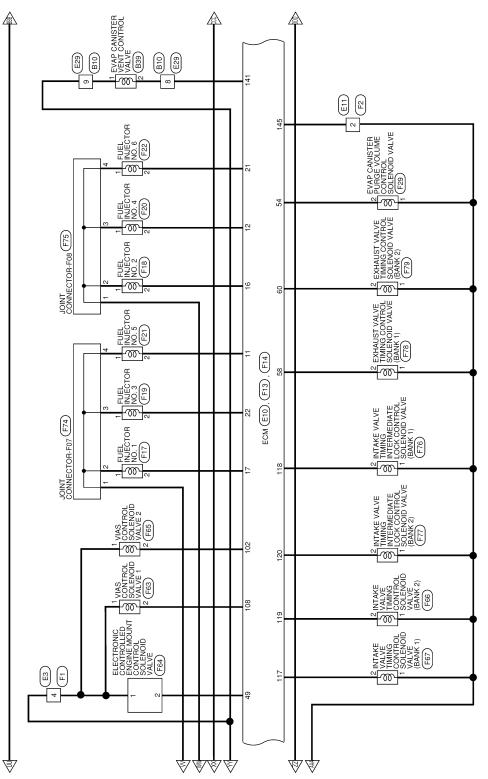
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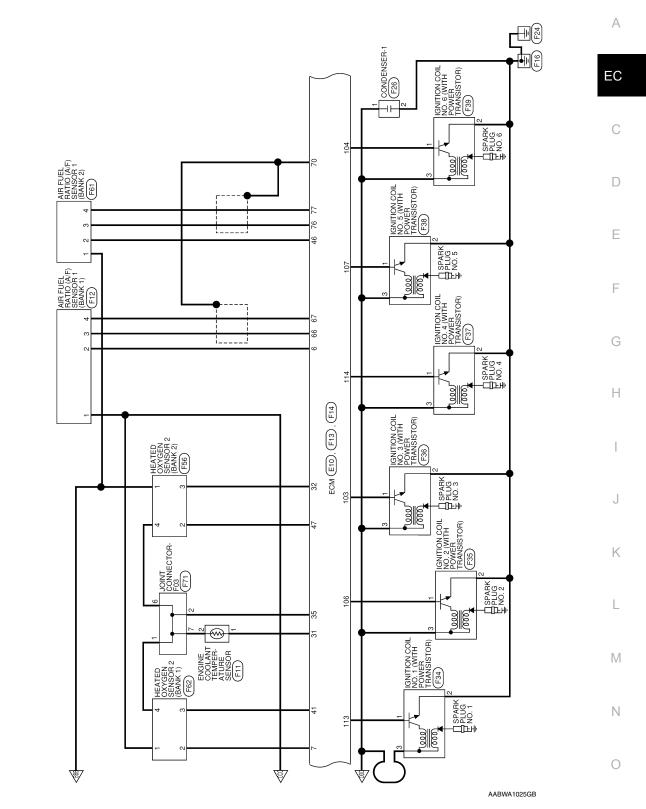




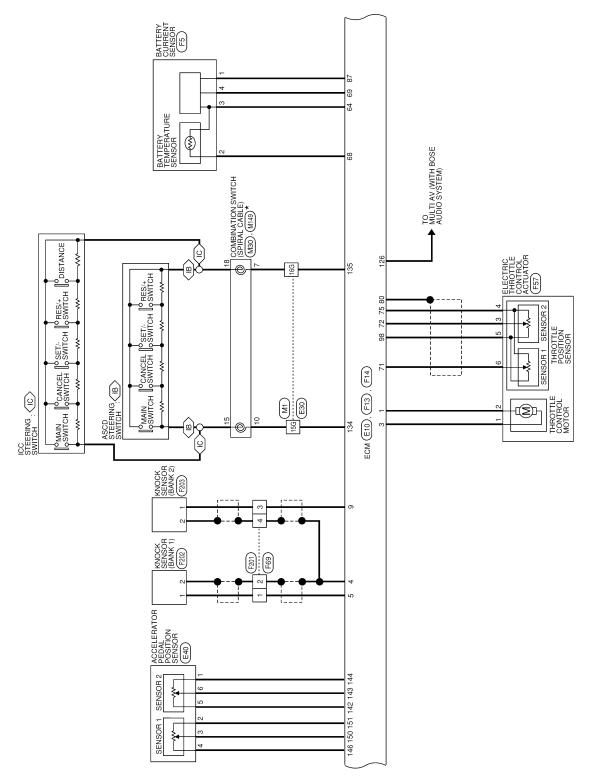
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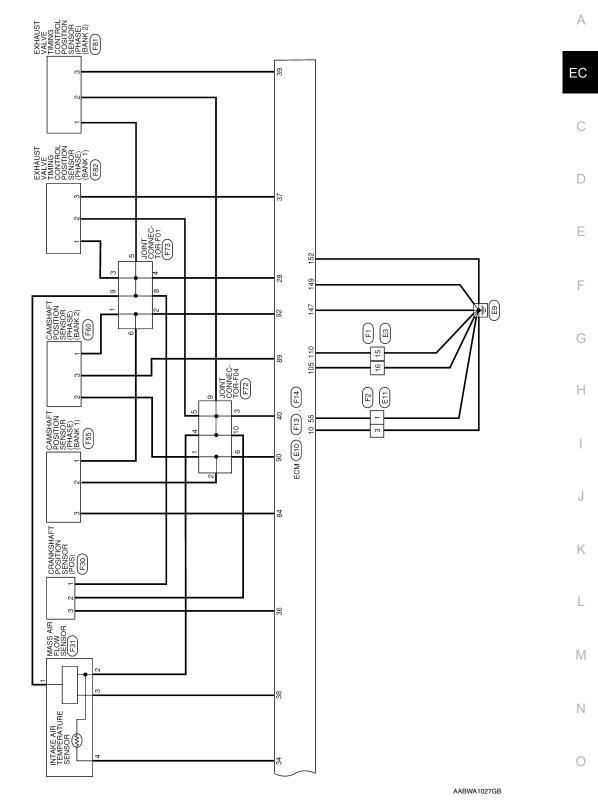
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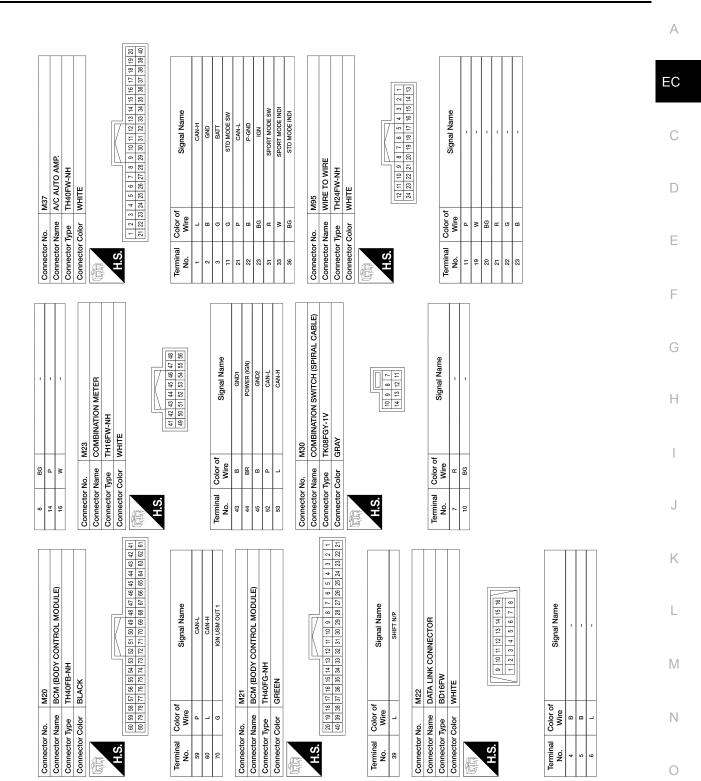
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116 115 114 113 112 111 110 108 108 107 106 105 105 105 128 127 126 125 124 123 122 121 120 119 118 1117 11.1 12.1 13.1 14.1 15.1 16.1 17.1 18.1 19.1 20.1 21.1 22.1 23.1 24.1 25.1 26.1 27.1 28.1 29.1 30.1 311 321 332 341 351 361 371 381 391 401 411 421 431 441 451 461 471 481 491 501 511 521 531 541 551 581 581 601 611 621 631 644 651 651 651 681 701 71.1 72.1 73.1 74.1 75.1 75.1 77.1 78.1 79.1 80.1 81.1 82.1 83.1 84.1 85.1 85.1 85.1 88.1 89.1 90.1 Connector Name BCM (BODY CONTROL MODULE) 1.1 2.1 3.1 4.1 5.1 6.1 7.1 8.1 9.1 10.1 91J 92J 93J 94J 95J 96J 97J 98J 99J 100J Signal Name Signal Name ACC RELAY OUT TH80FDGY-CS16-TM4 WIRE TO WIRE TH24FB-NH BLACK GRAY M18 9W Color of Wire Color of Wire Connector Type Connector Color Connector Color В Connector Name Connector Type Connector No. Connector No. Terminal No. Terminal No. H.S. H.S. 113 51J 53J 54J E e TR 6R 5R 4R 3R 2R 1R 16R 15R 13R 12R 11R 10R 9R 8R 7P 6P 5P 4P 3P 2P 1P 16P 15P 14P 13P 12P 11P 10P 9P 8P Signal Name Signal Name FUSE BLOCK (J/B) NS16FW-CS FUSE BLOCK (J/B) NS16FBR-CS BROWN WHITE Ą M5 Color of Wire Color of Wire Connector Type Connector Color Connector Name Connector Name G ۵. ≥ ۵ BB Connector Color Connector Type Connector No. Connector No. Terminal Terminal H.S. H.S. 12R 13R °. 筬 68 ŝ ۲, ₽ E 11G 12G 13G 14G 15G 16G 17G 18G 19G 20G 21G 31G 32G 33G 34G 35G 38C 37G 38G 49G 41G 42G 43G 44G 45G 46G 47G 48G 49G 50G 51052053054055056057058059006610 620630540650666670680693700 71G72G73G74G75G76G77G78G79G80G81G 82G83G84G85G86G87G88G89G90G 226236246256266276286296306 7N 6N 5N 4N 91G 92G 93G 94G 95G 96G 97G 98G 99G 100G 1G 2G 3G 4G ^{5G} 6G 7G 8G 9G 10G Signal Name Signal Name TH80FW-CS16-TM4 Connector Name FUSE BLOCK (J/B) WIRE TO WIRE 8N N CS06FW-M2 ЗN WHITE WHITE β Σ Color of Wire Color of Wire Connector Name ВВ Connector Color BG _ œ ٩ Connector Type Connector Color Connector Type Connector No. Connector No. Terminal No. Terminal H.S. H.S. 15G 16G 17G 32G 36G ŝ ٧٢

ENGINE CONTROL SYSTEM CONNECTORS



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ENGINE C	ONTROL	_ SYSTEN	И

DRIVE MODE SELECTOR

Connector Name

Connector Type Connector Color

M264

Connector No.

TH12FGY-NH

GRAY

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Signal Nar

Color of Wire

Terminal

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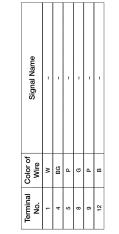
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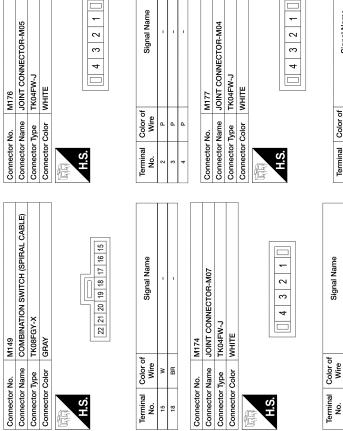
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H.S.

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JOINT CONNECTOR-M07 Connector No. M177	Connector Name JOINT CONNECTOR-M04	Connector Type TK04FW-J	Connector Color WHITE				Terminal Color of	No. Wire Signal Name	2 L –	3 F -	4 L -		Connector No. M181	Connector Name CHASSIS CONTROL MODULE	Connector Type TH24FW-NH	Connector Color WHITE			1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24	ame	kame	vame Terminal Color of Signal Name
TK04FW-J WHITE	WHITE]					f Signal Name	1	1		M175	JOINT CONNECTOR-M06	TK04FW-J	WHITE							f Signal Name	
	t						Color of Wire	٩	٩											Color of	Color of Wire	Color of Wire
Connector Type		Connector Color		MH/Hh	0 L	-	Terminal No.	e	4		Connector No.	Connector Name	Connector Type	Connector Color		(GPA)	H.S.			a D		





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Connector Name WIRE TO WIRE

M250

Connector No.

TH24MW-NH WHITE

Connector Type Connector Color

CAN-H

			2 1 3	Signal Name	-	1	I								1 2 3	4 5 6			Signal Name		1	1	-	1												
E11 WIRE TO WIRE		BROWN	<u> </u>	r of œ	~		-	E12		-								-	r of	e																
Connector No. Connector Name	Connector Type	Connector Color	ित्ति H.S.	Terminal Color of No. Wire		2 [G		Connector No.	Connector Name	Connector Type	Connector Color	-	ULAYAN	H.S.				ŀ	al	NO. Wire	- ~			5												
E10 ECM	RH24FB-RZ8-L-LH	BLACK	1 1	Signal Name	EVAP CONTROL SYSTEM PRESSURE SENSOR	-	CAN-L	SENSOR POWER SUPPLY	ENGINE SPEED OUTPUT SIGNAL		FUEL PAINA LEMPERALUHE SENSUA	1	Т	I	IGNITION SWITCH ASCRUCC STEEPING SWITCH	ASCD/ICC STEERING SWITCH ASCD/ICC STEERING SWITCH GROUND	Т	1		BLAKE PEDAL POSITION SWITCH	EVAP CANISTER VENT CONTROL VALVE	SENSOR POWER SUPPLY	ACCELERATOR PEDAL POSITION SENSOR 2	SENSOR GROUND	POWER SUPPLY FOR ECM	GEINGON FOWEN SUFFLI	SENSOR GROUND	ECM GROUND	ACCELERATOR PEDAL POSITION SENSOR 1	SENSOR GROUND	ECM GROUND					
Connector No. Connector Name		Connector Color	S.H	Terminal Color of No. Wire		122	+	+	126 R	+	129 -	- 130	- 131	_	+	135	- 136	- 137	138	140 GH	+	142 SB		-		147 GR			150 W		152 GR					
E3 WIRE TO WIRE	HN-NI		1 2 3 4 5 6 7 8 9 10 11 12 3 14 15 16	Signal Name	I	1		I	Ţ			FUSE BLOCK (J/B)	-W-CS				4M 3M 2M 1M	10M 9M 8M 7M 6M 5M				Signal Name	1	I	1	1										
Connector No. E3 Connector Name WIRE T		Connector Color WHITE	मन्त्र H.S.	Terminal Color of No. Wire		12 BG	+	15 GR						Connector Color WHILE	EB 1	6		10			Terminal Color of			5M P		8M W										

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Revision: October 2015

PPDM EIR (INTELLICENT M04FW-LC WHTE 0 0 0 0 0 0 0 0 0 0 0 0 0	Connector No.			Connector No.		E19	Connector No.		E30
	ctor Nai		PDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)	Connector I		⁹ dm e/r (intelligent power Nistribution module engine room)	Connector		WIRE TO WIRE THROMW-CS16-TM4
	ctor Typ		A04FW-LC	Connector		H32FW-NH	Connector (WHITE
	ctor Col		VHITE	Connector (VHITE	ĺ		
	Ś			H.S.			中国 H.S.		5G 4G 3C 2C 1G 10G 9G 8G 7G 6G
					35	12 12 24 25 26 27 28 29 31 32 33 34 16 37 38 38 40 41 42 43 44 45 46 47 48 80 50			21G20G19G18G17G18G15G14G13G12G11G 30G29G28G27G26G26G26G24G24G23G22G
Image: constant in the		olor of Wire	Signal Name	Terminal No.	Color of Wire	Signal Name			416400.396386376356356356356356356376376 506496486476486456446436426
Etamonerian Etamonerian E18 E18 E18 E18 PDM ER (INTELLIGENT POWER INTELLIGENT POWER WHTE E18 PDM ER (INTELLIGENT POWER INTERUTION MODULE ENGINE ROM) E18 WALL E11 WITE E11 ITA E11 ITA E11 WITE E11 ITA E11 ITA <td< td=""><td></td><td>×</td><td>MOTOR FAN 1</td><td>21</td><td>-</td><td>BCM IGNSW</td><td>_</td><td></td><td>61G 60G 59G 58G 57G 56G 55G 54G 53G 52G 51G</td></td<>		×	MOTOR FAN 1	21	-	BCM IGNSW	_		61G 60G 59G 58G 57G 56G 55G 54G 53G 52G 51G
Etal Contr Prime Erri (IntELICENT POWER Distribution MOLOLE Errighte Nuizerv.cs winterlicent power Nuizerv.cs winte		æ	F/L MOTOR FAN	27	BG	MOTOR FAN RLY MID			706696686676666666666666666666666
Ela Contri PipM ER (INTELLOENT POWER DISTRYLOS) Den ER (INTELLOENT POWER DISTRYLOS) Den ER (INTELLOENT POWER DISTRYLOS) NISTPRACS WHITE NISTPRACS NISTPRACS Contri NISTPRACS NISTPRACS Stantific Loent NISTPRACS NISTPRACS NISTPRACS NISTPRACS NISTPRACS NISTPRACS NISTPRACS NISTPRACS NISTPRACS NISTPRACS NISTPRACS Stantific Loent NISTPRACS NISTPRACS NISTPRACS NISTPRACS NISTPRACS N				28	٩	CAN-L			81G80G78G77G76G75G75G75G73G73G73G
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	ctor Nar	+		36	×	START IG-E/R			
National Stratukusti MHTE National Stratukusti Statukusti Stratukust			DISTRIBUTION MODULE ENGINE ROOM)	37	>	CLUTCH I/L SW			01G
WHTE Scale WHTE 0 <	ctor Tvp			99	J	MOTOR FAN RLY HI			
	ctor Col		VHITE	41		S-GND			
Temma Connector Name Prosesserent 12 13 14 15 16 17 16 10 10 12 13 14 15 16 17 16 17 16 17 16 17 16 17 16 17 16 17			1	43	9 I	IGN SIGNAL			
				42	-	PU SENS SIG-E/H	Tarminal	Color of	
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1/1 1/2 <td>ń</td> <td></td> <td>0 10</td> <td>P</td> <td>8</td> <td></td> <td>156</td> <td>G</td> <td>1</td>	ń		0 10	P	8		156	G	1
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Connector Name Wrei Wrei TO WRE Connector Name Wrei Wrei TO WRE Connector Type NSInFWVCS 200 10 R P-SND 200 VITE 200 R P-SND 201 VITE 200 R P-SND 200 10 200 R P-SND 200 VITE 200 R P-SND 200 10 200 R P-SND 200 10 200 R P-SND 200 10 200 R P-SND 200 200 200 200 R P-SND 200 200 200 200 200 R P-SND 200 200 200 200 200 200 R P-SND 200 200 200 200 200 200 200 R P-SND 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200			13 14 15 16 17	Connector		29	176	-	,
Color of Wire Signal Name R3 EF-W-CS R3 EF-W-CS wire Signal Name 280 V 280 V B P-SND 7 6 7 9 360 V R P-SND 7 6 3 2 1 <td< td=""><td></td><td></td><td></td><td>Connector I</td><td></td><td>VIRE TO WIRE</td><td>18G</td><td></td><td>1</td></td<>				Connector I		VIRE TO WIRE	18G		1
Color of Wree Signal Name Connector Ok MHTE B P-oxio P P MHTE 38 B P-oxio P P P P P R P-oxio P				Connector		S16FW-CS	32G	ГG	-
Wree signal vame B P-skin R P-skin R Ecowe I I No. Write No. Write Signal Name - 1 v 1 v 1 v 1 v 1 v 1 v 1 v 1 v 1 v 1 v 1 v		olor of		Connector (VHITE	36G	>	1
B P.GND L EGWYB R ULL PUMP NO. Wire NO. Wire Signal Name 1 V 1 V 1 V 2 R 1 V 1 V 1 V 1 V 2 R 3 Color of 8 G 1 V 1 V		Wire	Signal Name	Æ					
L EGNVB R FUELPUMP R FUELPUMP R FUELPUMP Signal Name 3 1 V No. Wre Signal Name - 8 - 8 -		в	P-GND	NHAN					
Rull Pump Full Pump 1 0 0 4 3 2 1 v v v v 9 4 1 3 2 1 v	13	-	ECM VB	HS					
Color of Wire Signal Name v - v - a - v - a - v - v - a - v -	15	æ	FUEL PUMP			5 4 3			
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			Connector Color BROWN				6 3]		No. Wire Signal Name				~		+			-		Connector Type M06FBR-R-LC	Connector Color BROWN		1449 1			75	6 0			Ierminal Color of Signal Name		2 W -		+															
-						11 10 9 8 7 6 5 4 3 2 1		22 21 20 19 18 17 16 15 14 13 12	 33 32 31 30 29 28 27 26 25 24 23			Signal Name	-	1	1	1	1	1	1	1			1	1			ACCELERATOR PEDAL POSITION SENSOR							2 3 4 5 6)				Signal Name	1	1	1	1	1	1						
2 R	Connector No. E39	-		Connector Color WHITE	1999	Ē	.0.1	22 21 20	33 32 31		Terminal Color of	No. Wire		9			6			17 W				22 P		Connector No. E40	e		1	1	(dd)	нс		-)		Terminal Color of		1 G	2 R		_	5 SB	۵. ۵						
	STOP LAMP RELAY	MS02FL-M2-LC	Е		3		2 × 1			Signal Name			-	I				BRAKE PEDAL POSITION SWITCH	M02FBR-LC	NWO				c	7	-			Signal Name		1			STOP I AMP SWITCH	M04FW-LC	TE C	1			4	- 4				Signal Name	1	1			
			Connector Color BLUE		H.S.				Torminal Color of	No. Wire	+	. a							Connector Type M02FI	Connector Color BROWN	4			H.S.					Terminal Color of				Connector No E38	4						Ъ́Ч				- F	Terminal Color of	NO. WIE	-			

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< WIRING DIAGRAM >

Connector No. E219	e	-		[TT]	H.S.			Terminal Color of Signal Name No.	2 K			Connector Name COOLING FAN MOTOR-1	Connector Type RS04GY-PR	Connector Color GRAY			HS	4 3	Terminal Color of Signal Name No. Wire	2 BR -										
N	+	- m m m m m m m m m m m m m m m m m m m	Connector No E201	e			H.S.	22 83 84 85 86 87 88 89 and at ac as as as at a		Terminal Color of Signal Name No.	+	IJ			Connector No. E203	Connector Name WIRE TO WIRE		LU LU	3 2 1			Ierminal Color of Signal Name No. Wire	\square	BH (r >	-				
Connector No. E66	e	A06FGY		<u>िंग</u> ूने	H.S.	6 5 4 3 2 1	-	Terminal Color of Signal Name No.	 		Connector No. E67	0	Connector Type A06FGY	Connector Color GRAY			H.S.	6 5 4 3 2 1	Terminal Color of Signal Name No. Wire	5 P -	6 P -			Connector lype MSU2FL-M2-LC			H.S.		Terminal Color of Signal Name No.	1 BG -

< WIRING DIAGRAM >

[VQ35DE]

Revision: October 2015

AABIA1609GB

Connector No. F11 Connector Name ENGINE COOL ANT TEMPERATLIRE	CONNECTOR NAME ENGINE COULANT LEMIPERATURE SENSOR		Connector Color GRAY)	Terminal Color of Signal Name		2 B	Connector No. F12	e	Connector Type RH04FDGY-P		H.S.		Terminal Color of Signal Name No.	w	3 W	: 0					
F2 WIRE TO WIRE	WIRE IO WIRE NSOBERR-CS	BROWN			7 6		Signal Name		1	5	BATTERY CURRENT SENSOR	SAZ04FGY			3 4 2	Signal Name	1	I						
Connector No. F	-		E	H.S.			Terminal Color of No. Wire	- 8		Connector No	e			H.S.		Terminal Color of No.		о н		_				
E221 COOI ING FAN MOTOR-2	COULING FAN MUTUR-Z BS04GY-PR	X			2 1 1 1		Signal Name					WIRE TO WIRE TH16FW-NH	E		8 7 6 5 4 3 2 1 16 15 14 12 11 10 9		Signal Name	1		1 1 1				
Connector No. E221				H.S.			Terminal Color of No. Wire	- °		4 B	Connector No. F1	Connector Name WIRE		E	N.H.		No. Wire	10 L						

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< WIRING DIAGRAM >

2016 Maxim	a NAM
2010 Maxim	

													Γ
Connector No.	F13												
Connector Name	ECM												
Connector Type	MAB35FB-MEB20-LH	5FB	Ę	Ë	ģ	Ξ							
Connector Color	BLACK												
					Ш							_	
S H	-	9	Ŧ	11 16 21 26 31 36 41	5	59	5	36 4	L	46	51		
011	2	7	9	17 22 27 32 37 42					L	47	52		
	e	80	13	12	3	82	1 22	18 23 28 33 38 43	L	48	53		
	4	6	Ш		п	_				6	5		
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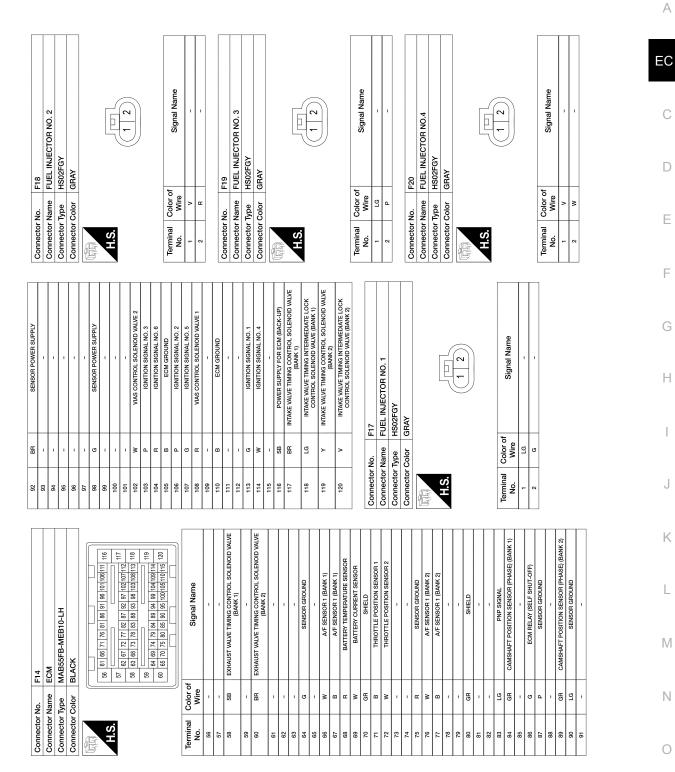
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EXHAUST VALVE TIMING CONTROL POSITION SENSOR (BANK 1)	MASS AIR FROW SENSOR	EXHAUST VALVE TIMING CONTROL POSITION SENSOR (BANK 2)	SENSOR GROUND	HEATED OXYGEN SENSOR 2 (BANK 1)	I	I	I	1	A/F SENSOR 1 HEATER (BANK 2)	HEATED OXYGEN SENSOR 2 HEATER (BANK 2)	I	ELECTRONIC CONTROLLED ENGINE MOUNT CONTROL SOLENOID VALVE	I	I	1	I	EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE	ECM GND
GR	GR	GR	BR	M		1	1	1	۶	ß		>	ı			1	BR	æ
37	88	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55

	LVE TIMING CONTROL POSITION SENSOR (BANK 1)	SS AIR FROW SENSOR	LVE TIMING CONTROL POSITION SENSOR (BANK 2)	SENSOR GROUND	OXYGEN SENSOR 2 (BANK 1)	1	1	1	1	ENSOR 1 HEATER (BANK 2)	GEN SENSOR 2 HEATER (BANK 2)	1	C CONTROLLED ENGINE MOUNT VITROL SOLENOID VALVE	1	1	1	-	
--	--	---------------------------	--	---------------	--------------------------	---	---	---	---	-------------------------	------------------------------	---	--	---	---	---	---	--

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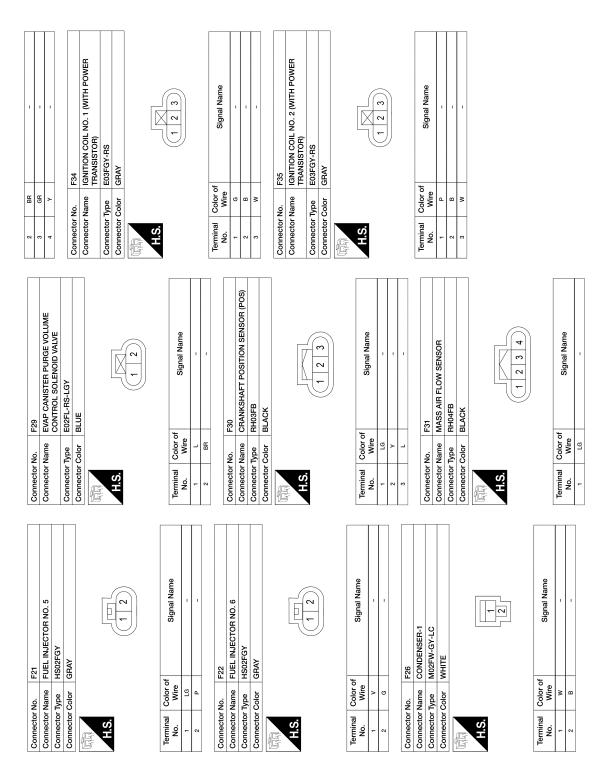
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E/R (INTELLIGENT POWER	DISTRIBUTION MODULE ENGINE ROOM)	NS10FW-CS	ш		52 53 54 55	56 57 58 59 60 61	Signal Name	02SENS #2	OZSENS #1 IN LECTOD #1	IGN COIL	ETC	ECM BAI ENG SOL	INJECTOR #2	ATECU		IPDM E/R (INTELLIGENT POWER DISTRIBILITION MODILIE FINGINE ROOM)	TH12FW-NH	ш			62 63 64 65 66 67 as an 7n 74 7n 72	C/ Z/ 1/ 0/ 60 00		Signal Name	ETC RLY CONT	MSdN	FPR	SSOFF					
Connector No. F30			Connector Color WHILE		ú		nal Color of . Wire			+		L SB		*	Connector No. F51	e	Connector Type TH12			ú				0	. Wire			U					
Conne		Conne	Conne	E	H.S.		Terminal No.	52	8 2	8	21	8 8	9	61	Conne	Conne	Conne	Conne	f	H.S.	1		_	Terminal	65 65	99	69	72					
F38 Ignition Coll No 5 (with power	TRANSISTOR)	E03FGY-RS	GHAY			1 2 3	Signal Name	1	1		F39	IGNITION COIL NO. 6 (WITH POWER		GRAY				1 2 3		Signal Name	Т	1	1										
Connector Name IC			Connector Color G		H.S.		Terminal Color of No. Wire		2 C		Connector No.	Connector Name IC	Connoctor Tuno	1.			1.0			Terminal Color of No. Wire			3 K										
F36 Ignition coil no 3 (with power	OR)	S					Signal Name	I	1			IGNITION COIL NO. 4 (WITH POWER	(H)				$\overline{}$	1 2 3		Signal Name	1	-	I										
			r Color GHAY				Color of Wire	۹.	8 3		r No. F37									Color of Wire		œ	M										
Connector No.		Connector Type	Connector Color	Æ	H.S.		Terminal No.	-	~ ~		Connector No.	Connector Name	Connector Tuno	Connector Color		N N	0.1			Terminal No.	-	2	e										

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ENGINE CONTROL SYSTEM

< WIRING DIAGRAM >

Connector No. F61 Connector Name AIR FUEL RATIO (A/F) SENSOR 1 (BANK 2) Connector Type RH04FDGY-P Connector Color GRAY	HS.	Terminal Color of Signal Name No. Wire	2	3 W -	4 B -		Connector No. F62	e	-	1.			LHS.	1234	Terminal Color of Signal Name	+	: 8	M				
F57 ELECTRIC THROTTLE CONTROL ACTUATOR RHOEFB	BLACK	signal Name	-	1	I	1	1	1		F60	CAMSHAFT POSITION SENSOR (PHASE) (BANK 2)	RH03FB	BLACK		1 2 3			Simol Nomo	Jugital Martie	I	I	
	H.S.	Terminal Color of	-	2 G	3 W		+	8 9			0		Connector Color	다. H.S.				Terminal Color of	No. Wire	1 BR	_	3 GR
F55 CAMSHAFT POSITION SENSOR (PHASE) (BANK 1) RH05FB	BLACK	if Signal Name	-	1	I		F56	HEATED OXYGEN SENSOR 2 (BANK 2)	RH04F02HS	GRAY			J K	(1 2 3 4)	If Signal Name	1		1	1			
	Connector Color H.S.	Terminal Color of	+	2 LG	3 GR		Connector No.	e	Connector Type	Connector Color	ED.		Ч.О.П		Terminal Color of No Wire		2 SB	3 W	4			

< WIRING DIAGRAM >

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	NSOR																																						A
	ENGINE OIL TEMPERATURE SENSOR	1				R.	1 2		Signal Name		1			ų						4 3			Signal Name	I	I	I	I												С
F68	ENGINE OIL T	E02FG-RS-LGY	GRAY				9						F69	WIRE TO WIRE	RS04FL-B	BLUE																							D
		Connector Type				ń			inal Color of							Connector Color		U	5			-	inal Color of Wire				SHIELD												E
Conne	Conne	Conne	Conne	E		Ч.С. Ч.С.			Terminal	°N S	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		Conne	Conne	Conne	Conne	Ē						Terminal No.	-	2	ς. Γ	4												F
			TROL								a					TROL										Ð													G
I			INTAKE VALVE TIMING CONTROL SOLENOID VALVE (BANK 2)	E02FG-RS-LGY	AY			1			Signal Name	,				INTAKE VALVE TIMING CONTROL	SOLENOID VALVE (BANK 1)	NV	E							Signal Name	1	I											Η
×		-			Color GRAY						Color of	wire -	· >		No. F67			-							Color of	Wire	-	BR											
2		Connector No.	Connector Name	Connector Type	Connector Color	ЦЦ .	H S				Terminal		2		Connector No.	Connector Name	Connoctor	Connector Color		E	SH	5			Terminel	No.	-	2											J
	-													E N	Ļ														2										K
	VIAS CONTROL SOLENOID VALVE 1						5		Signal Name		1			ELECTRONIC CONTROLLED ENGINE					5		7			signal Name	T	1			VIAS CONTROL SOLENOID VALVE 2 F02FB-RS				5		Signal Name	т			L
	AS CONTROL S	E02FB-RS	BLACK		L	-1	-))		0				4	ECTRONIC COL	FOFER-RS	BROWN			Ľ	ť	リ			ň					VIAS CONTROL SC F02FB-RS	BLACK					ō				M
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Connector No.	Connector Name	Connector Type	Connector Color	E		Й Ш			Terminal	No.	. ര		Connector No.	Connector Name	Connector Type	Connector Color		1444	H.S.				Terminal	No.	-	2		Connector No.	Connector Name	Connector Color	Ð	H.S.		Terminal	No.	-			0

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ENGINE CONTROL SYSTEM

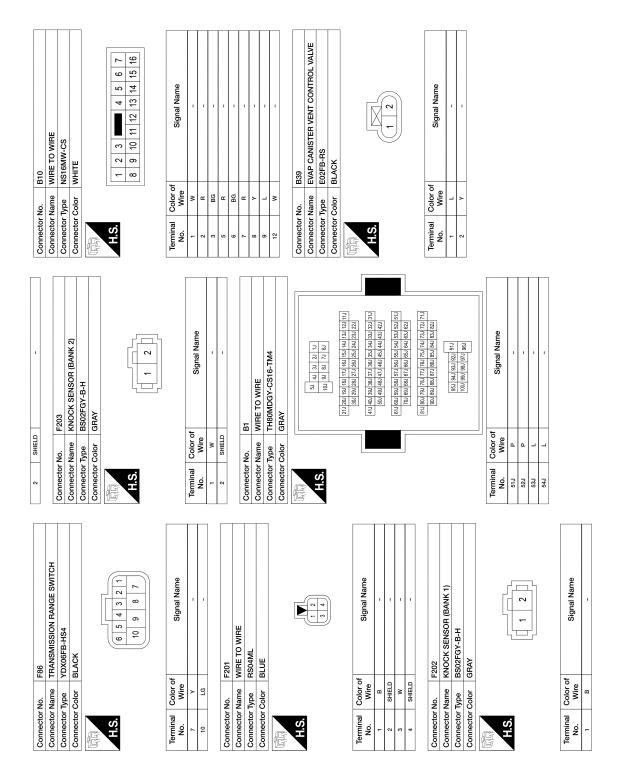
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	A
3ANK 1)	EC
F82 EXAMUST VALVE TIMING CONTROL POSITION SENSOR (PHASE) (BANK 1) RH03FB BLACK F83 JUINT CONNECTOR-F02 RH10FB BLACK 	С
F82 EXHAUST V POSITION S RH03FB BLACK BLACK BLACK	D
1 1 La 2 BR Connector No. 3 Gan Connector No. 6 F Connector No. 7 1 La 7 1 La 8 3 BR 9 1 La 1 1 La 1 1 La 2 BR Connector Type 6 V Connector No. 6 V Connector No. 6 V Connector No.	E
1 2 3 3 3 3 4 Connector Connector Connector Connector Connector 0 1 1 1 1 2 2 3 3 3 6 6 6 6	F
F79 E79 SOLENOID VALVE TIMING CONTROL SOLENOID VALVE EIANING CONTROL SOLENOID VALVE EIANING CONTROL SOLENOID VALVE EIANING CONTROL GRAY ERAY F80 END END END END END END END END	G
F79 F79 SOLHUUST VALVE TIMING CONTROL SOLENDID VALVE (BANK 2) SOLECTARS LGY E02FG-RS-LGY GRAY Signal Name Signal Name F80 ENGINE OIL PRESSURE SENSOR RHOBFB BLACK Signal Name	Н
F79 SOLENOID VALVI SOLENOID VALVI EDZEG-RS-LGY GRAV GRAV GRAV F80 BLACK BLACK BLACK BLACK	I
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	K
F7 NITAF NITAF NITAF LOCK CONTROL SOLENOID VALVE (BANK 2) EDEPEGARS EDEPEGARS EDEPEGARS EDEPEGARS EDEPEGARS EDEPEGARS EDEPEGARS EDEPEGARS ESIGNAL Signal Name FT8 FT9 FT8 FT9 FT9 F10 <th>L</th>	L
F77 INTAKE VALVE TIMING IN LOCK CONTROL SOLENC 2) ED2FG-RS-LGY ED2FG-RS-LGY GRAY F78 EXHAUST VALVE (BANK ESCENOID VALVE (BANK	Μ
	Ν
Connector Name Image: State of the s	0

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	Connector Color WHITE		H.S.		al	3 L -	4 L –		Connector No. B89	Connector Name ADAS CON ROL UNIT					16 15 14		Terminal Color of Signal Name No. Wire	14 W BRAKE RELAY											
	Connector Color WHITE		H.S.		inal Color of Signal Name	r L				Connector Name JOINT CONNECTOR-BUO				9			inal Color of Signal Name D. Wire			Connector No. B84		Connector Type I KU4FW-J Connector Color WHITE	7		Color of	Wire Signal Name		۰ ۵	
EVAP CONTROL SYSTEM PRESSURE Conne		ET .		123	Terminal	Signal Name	- 4				FUEL LEVEL SENSOR UNIT AND FUEL Conne	RS				6 5 4 3 2 1	Terminal	Cianal Mama		Conne		- Conne	UT T	H.S.	Term	No.	m	4	
Connector Name EVAP COI	Connector type EU3FGY-HS		H.S.			No. Wire		3 5 BG		Connector No. B42	Connector Name FUEL LEV		Connector Color GRAY	변권	H.S.		J	al	5	3 BG R	+	в							

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ENGINE CONTROL SYSTEM

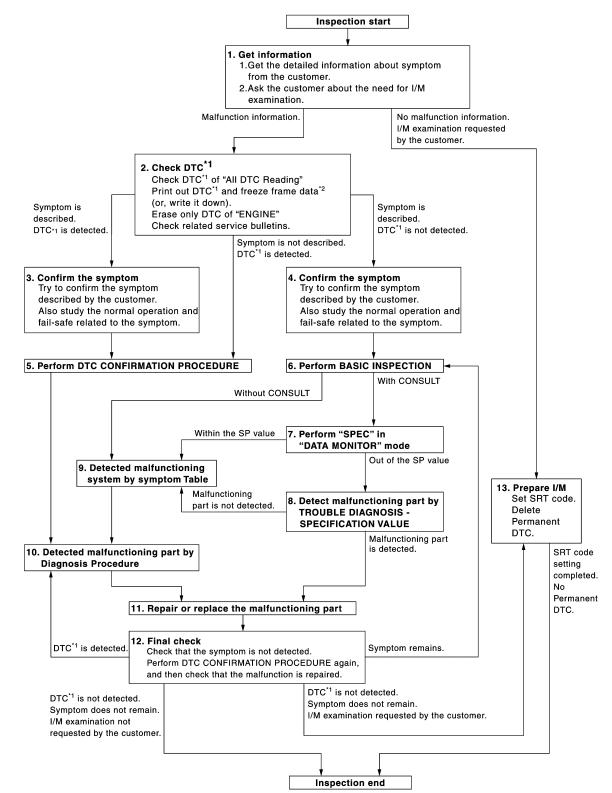
< WIRING DIAGRAM >

[VQ35DE]

BASIC INSPECTION DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

OVERALL SEQUENCE



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INFOID:000000011939697

1.

1.

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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-153, "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-575, "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-580, "Description" and EC-K 103, "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-580, "Description" and EC-103, "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-105, "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-164, "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 "MAS 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-182</u>, <u>"Component Function Check"</u>.

Is the measurement value within the SP value?

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

 $oldsymbol{\delta}$. DETECT MALFUNCTIONING PART BY TROUBLE DIAGNOSIS - SPECIFICATION VALUE

Detect malfunctioning part according to EC-183, "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-575</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-43</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-86, "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 Ε 1. Set SRT codes. Refer to EC-170, "Description". Erase permanent DTCs. Refer to <u>EC-176, "Description"</u>. F >> INSPECTION END. Diagnostic Work Sheet INFOID:000000011939698 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. L

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DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

WORKSHEET SAMPLE

Customer na	me MR/MS	Model & Year	VIN							
Engine #		Trans.	Mileage							
Incident Date	•	Manuf. Date	In Service Date							
Fuel and fuel	filler cap	 Vehicle ran out of fuel causing misfire Fuel filler cap was left off or incorrectly 	/ screwed on.							
	☐ Startability	Impossible to start No combust Partial combustion affected by th Partial combustion NOT affected Possible but hard to start Other	nrottle position I by throttle position							
Symptoms	🗌 Idling	□ No fast idle □ Unstable □ 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 dece Just after stopping While loadi	lerating							
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 condi	tions	Engine speed 0 2,000	4,000 6,000 8,000 rpm							
Road condition	ons	🗌 In town 🗌 In suburbs 🗌 Hig	hway 🗌 Off road (up/down)							
Driving condi	tions	While accelerating While cruis While decelerating While turning Vehicle speed	ng (RH/LH)							
Molfunction	adiaatay lawa	0 10 20	30 40 50 60 MPH							
Malfunction in	ndicator lamp	☐ Turned on ☐ Not turned on								

MTBL0017

SERVICE AFTER REPLACING OR REMOVING ENGINE PARTS NSPECTION > [VQ35DE]

< BASIC INSPECTION >

SERVICE AFTER REPLACING OR REMOVING ENGINE PARTS

Description

SPECIAL REPAIR REQUIREMENT

				×: Applicable				
Derterer	Service p	erformed		Deferre				
Part name	Replacement	Removal ^{*1}	- Required service	Reference	С			
	×		Additional service when replacing ECM	<u>EC-156</u>				
			Accelerator pedal released position learning	<u>EC-158</u>	D			
ECM			Throttle valve closed position learning	<u>EC-159</u>				
	× Idle air volume learning							
			VIN registration	<u>EC-163</u>	Ε			
Accelerator Pedal	×	×	Accelerator pedal released position learning	<u>EC-158</u>				
Electric throttle	×	×	Throttle valve closed position learning	<u>EC-159</u>	F			
Electric throttle	×		Idle air volume learning	<u>EC-160</u>	1			
			Throttle valve closed position learning*2	<u>EC-159</u>				
Engine assembly	×		Idle air volume learning*2	<u>EC-160</u>	G			
Engine assembly			Accelerator pedal released position learning	<u>EC-158</u>				
		×	Throttle valve closed position learning*2	<u>EC-159</u>	Н			

*1: Harness connector disconnection included.

*2: Replacement of engine with a electric throttle.

INFOID:000000011939699

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EC

ADDITIONAL SERVICE WHEN REPLACING ECM

< BASIC INSPECTION >

ADDITIONAL SERVICE WHEN REPLACING ECM

Description

When replacing ECM, the following procedure must be performed. (For details, refer to <u>EC-156, "Work Proce-dure"</u>.)

PROGRAMMING OPERATION

NOTE:

After replacing with a blank ECM, programming is required to write ECM information. Be sure to follow the procedure to perform the programming.

BEFORE REPLACEMENT

When replacing ECM, perform "SAVING DATA FOR REPLC CPU" in "WORK SUPPORT" of "ENGINE" by using CONSULT to save current ECM data before replacement.

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

Work Procedure

1.SAVE ECM DATA

With CONSULT

- Turn ignition switch OFF.
- 2. Reconnect all harness connectors disconnected.
- 3. Turn ignition switch ON.
- 4. Select "SAVING DATA FOR REPLC CPU" in "WORK SUPPORT" mode of "ENGINE" using CONSULT.
- 5. Follow the instruction of CONSULT display.

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.

Is 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 programming instructions. Refer to CONSULT Operation Manual.

NOTE:

• The ECM part number is saved in CONSULT.

• Even when ECM part number is not saved in CONSULT, go to 4.

>> GO TO 4.

4.PERFORM ECM PROGRAMMING

After replacing ECM, perform the ECM programming. Refer to CONSULT Operation Manual. **NOTE:**

• Refer to EC-586, "Removal and Installation" for replacement of ECM.

EC-156

INFOID:000000011939700

INFOID:0000000011939701

ADDITIONAL SERVICE WHEN REPLACING ECM

< BASIC INSPECTION >	[VQ35DE]
 During programming, maintain the following conditions: Ignition switch: ON Electric load: OFF Brake pedal: Not depressed 	A
 Battery voltage: 12 – 13.5 V (Be sure to check the value of battery voltage by selecting "BATTER "Data monitor" of CONSULT.) 	RY VOLT" in EC
>> GO TO 6.	С
5.REPLACE ECM	
Replace ECM. Refer to EC-586, "Removal and Installation".	D
>> GO TO 6.	
${f 6}.$ PERFORM INITIALIZATION OF IVIS (NATS) SYSTEM AND REGISTRATION OF ALL IVIS (NTION KEY IDS	IATS) IGNI- E
Refer to DLK-71, "Description".	
	F
>> GO TO 7.	
7.CHECK ECM DATA STATUS	G
Check if the data is successfully copied from the ECM at Step 1 (before replacement) and saved in <u>Is the data saved successfully?</u>	CONSULT.
YES >> GO TO 8.	Н
NO >> GO TO 9.	
8.WRITE ECM DATA	
 With CONSULT Select "WRITING DATA FOR REPLC CPU" in "WORK SUPPORT" mode of "ENGINE" using 0 Follow the instruction of CONSULT display. 	
NOTE: The data saved by "SAVING DATA FOR REPLC CPU" is written to ECM.	J
>> GO TO 10.	K
9.PERFORM VIN REGISTRATION	
Refer to EC-163, "Description".	L
>> GO TO 10.	
10.PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING	M
Refer to EC-158, "Description".	
NN CO TO 44	Ν
>> GO TO 11. 11. PERFORM THROTTLE VALVE CLOSED POSITION LEARNING	
Refer to <u>EC-159, "Description"</u> .	0
	-
>> GO TO 12.	Р
12. PERFORM IDLE AIR VOLUME LEARNING	F
Refer to EC-160, "Description".	

>> END

ACCELERATOR PEDAL RELEASED POSITION LEARNING

< BASIC INSPECTION >

ACCELERATOR PEDAL RELEASED POSITION LEARNING

Description

INFOID:000000011939702

[VQ35DE]

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 <u>EC-158</u>, "Work Procedure".

Work Procedure

INFOID:000000011939703

1.START

- 1. Check that accelerator pedal is fully released.
- 2. Turn ignition switch ON and wait at least 2 seconds.
- 3. Turn ignition switch OFF and wait at least 10 seconds.
- 4. Turn ignition switch ON and wait at least 2 seconds.
- 5. Turn ignition switch OFF and wait at least 10 seconds.

>> END

THROTTLE VALVE CLOSED POSITION LEARNING

< BASIC INSPECTION >

THROTTLE VALVE CLOSED POSITION LEARNING

Description

Throttle Valve Closed Position Learning is a function of ECM to learn the fully closed position of the throttle valve by monitoring the throttle position sensor output signal. It must be performed each time the harness connector of electric throttle control actuator or ECM is disconnected or electric throttle control actuator is cleaned.

For details, refer to EC-159, "Work Procedure".

Work Procedure

1.start	D
 WITH CONSULT Turn ignition switch ON. Select "CLSD THL POS LEARN" in "WORK SUPPORT" mode. Follow the instructions on the CONSULT display. 	E
4. Turn ignition switch OFF and wait at least 10 seconds. Check that throttle valve moves during the above 10 seconds by confirming the operating sound.	F
 WITHOUT CONSULT Start the engine. NOTE: 	G
 Coolant temperature is less than 25°C (77°F) before engine starts. Warm up the engine. NOTE: 	
Warm up the engine until "COOLANT TEMP/S" on "DATA MONITOR" of CONSULT reaches more t 65°C (149°F).	than H
 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. 	I
>> END	J

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IDLE AIR VOLUME LEARNING

Description

Idle Air Volume Learning is a function of ECM to learn the idle air volume that keeps engine idle speed within the specific range. It must be performed under the following conditions:

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

For details, refer to EC-160, "Work Procedure".

Work Procedure

INFOID:000000011939707

1.PRECONDITIONING

Check that all of the following conditions are satisfied.

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

- Battery voltage: More than 12.9 V (At idle)
- Engine coolant temperature: 70 100°C (158 212°F)
- Selector lever position: P or N
- Electric load switch: OFF

 (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
- Transmission: Warmed-up
- With CONSULT: Drive vehicle until "ATF TEMP SEN" in "DATA MONITOR" mode of "CVT" system indicates less than 0.9 V.
- Without CONSULT: Drive vehicle for 10 minutes.

Will CONSULT be used?

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

2. PERFORM IDLE AIR VOLUME LEARNING

With CONSULT

- 1. Perform Accelerator Pedal Released Position Learning. Refer to EC-158. "Description".
- 2. Perform Throttle Valve Closed Position Learning. Refer to EC-159, "Description".
- 3. Start engine and warm it up to normal operating temperature.
- 4. Select "IDLE AIR VOL LEARN" in "WORK SUPPORT" mode.
- 5. Touch "START" and wait 20 seconds.

Is "CMPLT" displayed on CONSULT screen?

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

3. Perform idle air volume learning

Without CONSULT

NOTE:

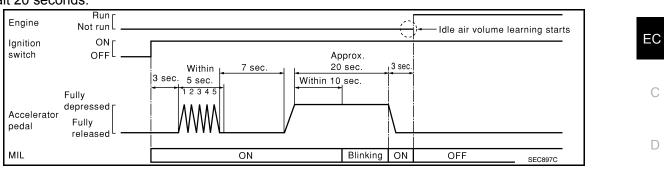
- It is better to count the time accurately with a clock.
- It is impossible to switch the diagnostic mode when an accelerator pedal position sensor circuit has a malfunction.
- 1. Perform Accelerator Pedal Released Position Learning. Refer to EC-158, "Description".
- 2. Perform Throttle Valve Closed Position Learning. Refer to EC-159, "Description".
- 3. Start engine and warm it up to normal operating temperature.
- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Confirm that accelerator pedal is fully released, turn ignition switch ON and wait 3 seconds.
- 6. Repeat the following procedure quickly 5 times within 5 seconds.
- Fully depress the accelerator pedal.
- Fully release the accelerator pedal.
- 7. Wait 7 seconds, fully depress the accelerator pedal for approx. 20 seconds until the MIL stops blinking and turns ON.

INFOID:000000011939706

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-581, "Work Procedure"</u> and <u>EC-582, "Work Procedure"</u> . For specifications, refer to <u>EC-587, "Idle Speed"</u> and <u>EC-587, "Ignition Timing</u> ".	F
Is the inspection result normal? YES >> INSPECTION END NO >> GO TO 5.	G
5. DETECT MALFUNCTIONING PART-I	Н
 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. 	I
<u>Is the inspection result normal?</u> YES >> GO TO 6. NO >> Repair or replace malfunctioning part.	J
6.DETECT MALFUNCTIONING PART-II	
Engine component parts and their installation condition are questionable. Check and eliminate the cause of the incident.	K
It is useful to perform "TROUBLE DIAGNOSIS - SPECIFICATION VALUE". Refer to <u>EC-182</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.	L
	M
>> INSPECTION END	
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[VQ35DE]

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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 EC-162, "Work Procedure".

Work Procedure

1.START

With CONSULT

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

With GST

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

>> END

INFOID:000000011939709

[VQ35DE]

VIN REGISTRATION

< BASIC INSPECTION >

VIN REGISTRATION

	А
Description	000011939710
VIN Registration is an operation to register VIN in ECM. It must be performed each time ECM is replac NOTE:	ed. EC
Accurate VIN which is registered in ECM may be required for Inspection & Maintenance (I/M). For details, refer to <u>EC-163</u> , "Work Procedure".	
Work Procedure	C 0000011939711
1.CHECK VIN	D
Check the VIN of the vehicle and note it. Refer to GI-34, "Identification Plate".	
>> GO TO 2.	E
2.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. 	F
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>> END	Н
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[VQ35DE]

BASIC INSPECTION

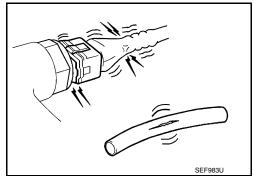
Work Procedure

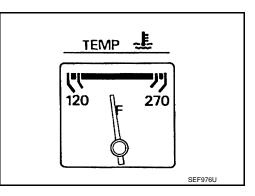
[VQ35DE]

INFOID:000000011939712

1.INSPECTION START

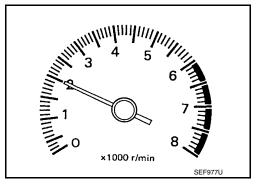
- 1. Check service records for any recent repairs that may indicate a related malfunction, or a current need for scheduled maintenance.
- 2. Open engine hood and check the following:
- Harness connectors for improper connections
- Wiring harness for improper connections, pinches and cut
- Vacuum hoses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





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

[VQ35DE]

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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. nunununun 3. Check idle speed. For procedure, refer to EC-581, "Work Procedure". For specification, refer to EC-587, "Idle Speed". Is the inspection result normal? YES >> GO TO 10. NO >> GO TO 4. x1000rpm PBIA8513J 4.PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING 1. Stop engine. Perform Accelerator Pedal Position Learning. Refer to EC-158, "Description". 2. >> GO TO 5. 5.PERFORM THROTTLE VALVE CLOSED POSITION LEARNING Perform Throttle Valve Closed Position Learning. Refer to EC-159, "Description". >> GO TO 6. **Ó**.PERFORM IDLE AIR VOLUME LEARNING Perform Idle Air Volume Learning. Refer to EC-160, "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-581, "Work Procedure". For specification, refer to EC-587, "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 EC-332, "Diagnosis Procedure". Check crankshaft position sensor (POS) and circuit. Refer to EC-327, "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.) Perform initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key IDs. Refer to DLK-71, "Description". >> 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-582, "Work Procedure".

BASIC INSPECTION

< BASIC INSPECTION >

For specification, refer to EC-587, "Ignition Timing".

Is the inspection result normal?

YES >> GO TO 19.

NO >> GO TO 11.

11.PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING

1. Stop engine.

2. Perform Accelerator Pedal Position Learning. Refer to EC-158, "Description".

>> GO TO 12.

12.PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Perform Throttle Valve Closed Position Learning. Refer to EC-159, "Description".

>> GO TO 13.

13.PERFORM IDLE AIR VOLUME LEARNING

Perform Idle Air Volume Learning. Refer to <u>EC-160, "Description"</u>.

Is Idle Air Volume Learning carried out successfully?

YES >> GO TO 14.

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

14. CHECK IDLE SPEED AGAIN

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

Check idle speed.
 For procedure, refer to <u>EC-581, "Work Procedure"</u>.
 For specification, refer to <u>EC-587, "Idle Speed"</u>.

Is the inspection result normal?

YES >> GO TO 15.

NO >> GO TO 17.

15. CHECK IGNITION TIMING AGAIN

1. Run engine at idle.

 Check ignition timing with a timing light. For procedure, refer to <u>EC-582, "Work Procedure"</u>. For specification, refer to <u>EC-587, "Ignition Timing</u>".

Is the inspection result normal?

YES >> GO TO 19.

NO >> GO TO 16.

16.CHECK TIMING CHAIN INSTALLATION

Check timing chain installation. Refer to <u>EM-66, "Exploded View"</u>.

Is the inspection result normal?

YES >> GO TO 17.

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

17. DETECT MALFUNCTIONING PART

Check the following.

Check camshaft position sensor (PHASE) and circuit. Refer to <u>EC-332, "Diagnosis Procedure"</u>.

Check crankshaft position sensor (POS) and circuit. Refer to EC-327, "Diagnosis Procedure".

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, although this is rare.)

BASIC INSPECTION

< BASIC INSPECTION >	[VQ35DE]
 Perform initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key I <u>EC-156, "Description"</u>. 	Ds. Refer to A
>> GO TO 4.	Fo
19.INSPECTION END	EC
If ECM is replaced during this BASIC INSPECTION procedure, perform <u>EC-156</u> , "Description".	
>> INSPECTION END	С
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FUEL PRESSURE

Work Procedure

FUEL PRESSURE RELEASE

(I) With CONSULT

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

Without CONSULT

- 1. Remove fuel pump fuse located in IPDM E/R.
- 2. Start engine.
- 3. After engine stalls, crank it 2 or 3 times to release all fuel pressure.
- 4. Turn ignition switch OFF.
- 5. Reinstall fuel pump fuse after servicing fuel system.

FUEL PRESSURE CHECK

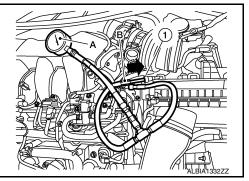
CAUTION:

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

- Prepare pans or saucers under the disconnected fuel line because the fuel may spill out. The fuel pressure cannot be completely released because this models do not have fuel return system.
- Be careful not to scratch or get the fuel hose connection area dirty when servicing, so that the quick connector o-ring maintains seal ability.
- Use Fuel Pressure Gauge Kit [SST: (J-44321)] and Fuel Pressure Adapter [SST: (J-44321-6)] to check fuel pressure.
- 1. Release fuel pressure to zero.
- 2. 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 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.
 - A : Fuel pressure gauge
 - B : Fuel pressure adapter
 - ① : Quick connector
- 4. Turn ignition switch ON (reactivate fuel pump) and check for fuel leakage.
- 5. Start engine and check for fuel leakage.
- 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 (3.5 bar, 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



INFOID:000000011939713

FUEL PRESSURE

< B	BASIC INSPECTION >	[VQ35DE]	
	 Fuel filter for clogging Fuel pump Fuel pressure regulator for clogging 		A
9.	If OK, replace fuel pressure regulator. If NG, repair or replace malfunctioning part.		EC
10.	Before disconnecting Fuel Pressure Gauge kit [SST: — (J-44321)] and Fuel Pressure Adapter 44321-6)], release fuel pressure to zero.	[SST: — (J-	
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HOW TO SET SRT CODE

< BASIC INSPECTION >

HOW TO SET SRT CODE

Description

INFOID:000000011939714

[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	2	Three way catalyst function	P0420, P0430
EVAP SYSTEM	2	EVAP control system purge flow monitoring	P0441
		EVAP control system	P0456
HO2S	2	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	3	Intake valve 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

HOW TO SET SRT CODE

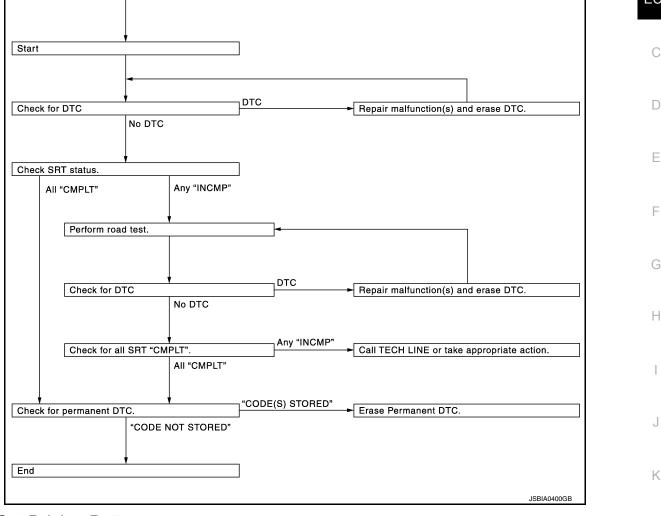
< BASIC INSPECTION >

Vehicle rejected by I/M

[VQ35DE]

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:

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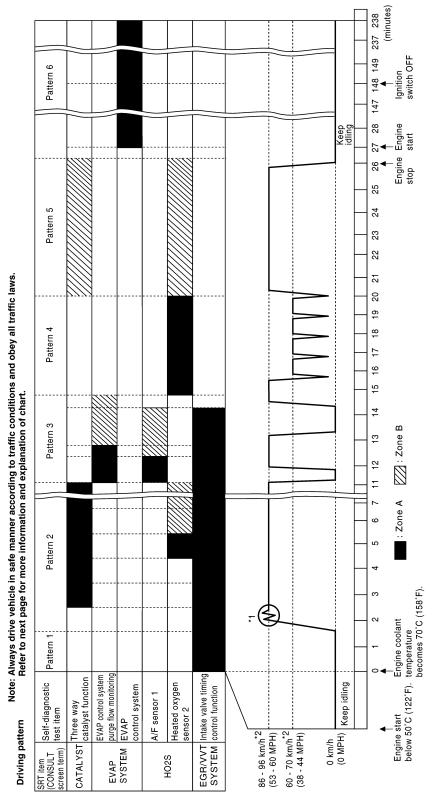
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Always drive the vehicle in safe manner according to traffic conditions and obey all traffic laws.



*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".

HOW TO SET SRT CODE

HOW TO SET SRT CODE	
< BASIC INSPECTION >	[VQ35DE]
*: Normal conditions - Sea level - Flat road - Ambient air temperature: 20 – 30°C (68 – 86°F)	А
NOTE: Diagnosis is performed as quickly as possible under normal conditions. However, under other diagnosis may also be performed. [For example: ambient air temperature other than 20 – 30°C (6	
Work Procedure	FOID:0000000011939716
1.снеск отс	
Check DTC. <u>Is any DTC detected?</u>	D
YES >> Repair malfunction(s) and erase DTC. Refer to <u>EC-107. "DTC Index"</u> . NO >> GO TO 2.	E
2.CHECK SRT STATUS	
With CONSULT Select "SRT STATUS" in "DTC & SRT CONFIRMATION" mode with CONSULT. Without CONSULT	F
Perform "SRT status" mode with <u>EC-70, "On Board Diagnosis Function"</u> .	G
<u>Is SRT code(s) set?</u> YES >> GO TO 12.	Н
NO-1 >> With CONSULT: GO TO 3. NO-2 >> Without CONSULT: GO TO 4.	1
3.DTC CONFIRMATION PROCEDURE	
 Select "SRT WORK SUPPORT" in "DTC & SRT CONFIRMATION" mode with CONSULT. For SRT(s) that is not set, perform the corresponding "DTC CONFIRMATION PROCEDURE" the "Performance Priority" in the "SRT ITEM" table. Refer to <u>EC-170</u>, "<u>Description</u>". Check DTC. 	according to J
Is any DTC detected?	K
YES >> Repair malfunction(s) and erase DTC. Refer to <u>EC-107, "DTC Index"</u> . NO >> GO TO 11.	
4.PERFORM ROAD TEST	1
 Check the "Performance Priority" in the "SRT ITEM" table. Refer to <u>EC-170, "Description"</u>. Perform the most efficient SRT set driving pattern to set the SRT properly. Refer to <u>EC-171, "SI</u> 	RT Set Driv-
ing Pattern". In order to set all SRTs, the SRT set driving pattern must be performed at least once.	Μ
>> GO TO 5. 5. PATTERN 1	Ν
 Check the vehicle condition; Engine coolant temperature is –10 to 35°C (14 to 95°F). 	0
 Fuel tank temperature is more than 0°C (32°F). Start the engine. 	
 Keep engine idling until the engine coolant temperature is greater than 70°C (158°F) NOTE: 	Р
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 <u>EC-86, "Reference Value"</u> .	

Revision: October 2015

>> 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 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.

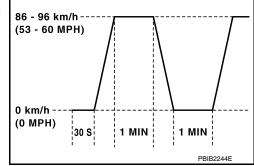
>> GO TO 7.

7.PATTERN 3

• Operate vehicle following the driving pattern shown in the figure.

 Release the accelerator pedal during deceleration of vehicle speed from 90 km/h (56 MPH) to 0 km/h (0 MPH).
 86 - 96 km/ (53 - 60 MP

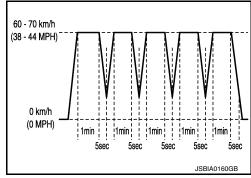
>> GO TO 8.



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 maintain the speed.
- Release the accelerator pedal fully at least 5 seconds.
- Repeat the above two steps at least 5 times.

>> GO TO 9.



9. PATTERN 5

- The accelerator pedal must be held very steady during steady-state driving.
- If the accelerator pedal is moved, the test must be conducted again.

>> GO TO 10.

10.PATTERN 6

Cool down the engine so that the engine coolant temperature lowers between 15 – 35°C (59 – 95°F).
 CAUTION:

Never turn the ignition switch ON while cooling down the engine.

Engine coolant temperature at engine start is between 15 – 35°C (59 – 95°F) and has lowered 45°C (113°F) or more since the latest engine stop.

>> GO TO 11.

11.CHECK SRT STATUS

With CONSULT

HOW TO SET SET CODE

HOW TO SET SRT CODE		
< BASIC INSPECTION >	[VQ35DE]	
Select "SRT STATUS" in "DTC & SRT CONFIRMATION" mode with CONSULT. Without CONSULT Perform "SRT status" mode with <u>EC-70, "On Board Diagnosis Function"</u> .	A	
With GST Select Service \$01 with GST. <u>Is SRT(s) set?</u>	EC	
YES >> GO TO 12. NO >> Call TECH LINE or take appropriate action. 12. CHECK PERMANENT DTC	C	
NOTE: Permanent DTC cannot be checked with a tool other than CONSULT or GST. With CONSULT	D	
Select "SRT STATUS" in "DTC & SRT CONFIRMATION" mode with CONSULT. With GST Select Service \$0A with GST.	E	
<u>Is permanent DTC(s) detected?</u> YES >> Proceed to <u>EC-176, "Description"</u> . NO >> END	F	
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HOW TO ERASE PERMANENT DTC

< BASIC INSPECTION >

HOW TO ERASE PERMANENT DTC

Description

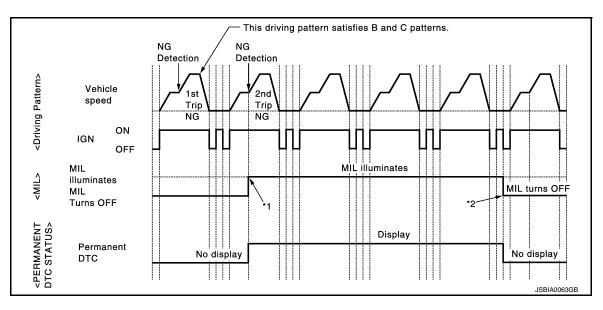
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[VQ35DE]

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. *2: 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 permanent DTC is not erased, perform the procedure of Group A.

×: Applicable —: Not applicable

O *	Perform "DTC CONFIRMATION PROCEDURE" for applicable DTCs.	DNFIRMATION PROCEDURE" Driving pattern		Reference
Group		В	D	Relefence
А	x	_	_	EC-177, "Work Pro- cedure (Group A)"
В	_	×	×	EC-179, "Work Pro- cedure (Group B)"

*: For group, refer to <u>EC-107, "DTC Index"</u>.

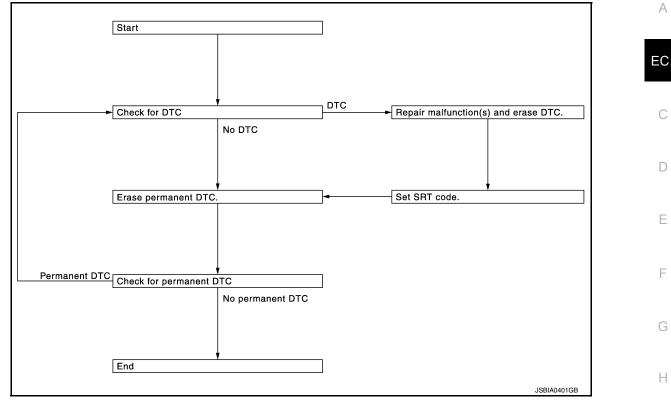
PERMANENT DTC ITEM

For permanent DTC items, MIL turns ON. Refer to EC-107, "DTC Index".

HOW TO ERASE PERMANENT DTC

< BASIC INSPECTION >

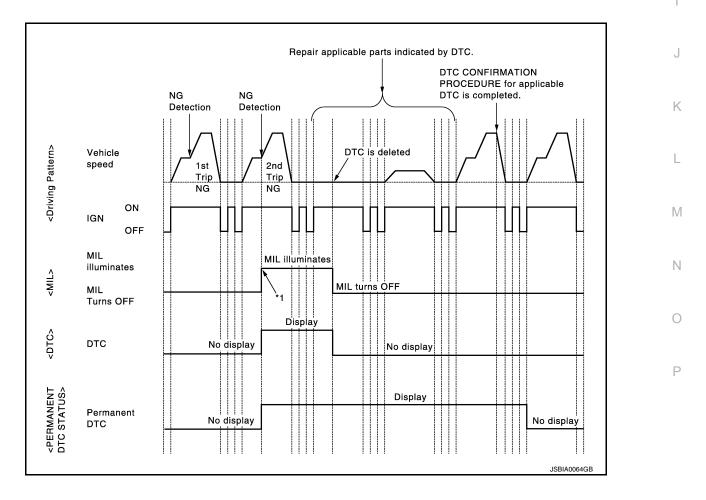
PERMANENT DTC SERVICE PROCEDURE



Work Procedure (Group A)

INFOID:000000011939718

[VQ35DE]



Revision: October 2015

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

1. СНЕСК 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

- 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 Service \$0A with GST.

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 ECM. Refer to EC-107, "DTC Index".

>> GO TO 4.

4.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

- 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 Service \$0A with GST.
- Is any permanent DTC detected?
- YES >> GO TO 1.
- NO >> END

HOW TO ERASE PERMANENT DTC

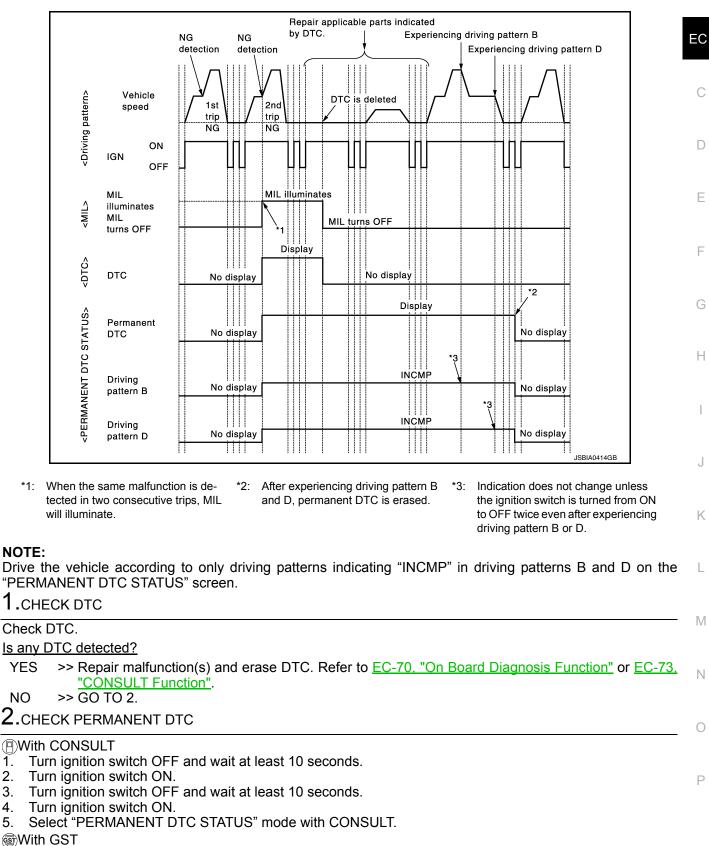
< BASIC INSPECTION >

Work Procedure (Group B)



[VQ35DE]

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- 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.

1. 2.

3. 4.

5.

HOW TO ERASE PERMANENT DTC

< BASIC INSPECTION >

- 4. Turn ignition switch ON.
- 5. Select Service \$0A with GST.

Is any permanent DTC detected?

YES >> GO TO 3. NO >> END

3. DRIVE DRIVING PATTERN B

CAUTION:

- Always drive at a safe speed.
- Never erase self-diagnosis results.
- 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

- 1. 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>, "<u>CONSULT Function</u>", <u>EC-67</u>, "<u>DIAGNOSIS DESCRIPTION</u> : <u>Driving Pattern</u>".

With GST

- 1. 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> <u>Pattern"</u>.

>> GO TO 4.

4.CHECK PERMANENT DTC

() 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. Select "PERMANENT DTC STATUS" mode with CONSULT.

With GST

- 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 Service \$0A with GST.

Is any permanent DTC detected?

YES >> GO TO 5. NO >> END

5. DRIVE DRIVING PATTERN D

CAUTION:

- Always drive at a safe speed.
- Never erase self-diagnosis results.
- 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.
- 1. Drive the vehicle according to driving pattern D. Refer to <u>EC-67. "DIAGNOSIS DESCRIPTION : Driving</u> <u>Pattern"</u>.

>> GO TO 6.

6.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.

HOW TO ERASE PERMANENT DTC

HOW TO ERASE PERMANENT DIC	
< BASIC INSPECTION >	[VQ35DE]
5. Select "PERMANENT DTC STATUS" mode with CONSULT.	٥
With GST 1. Turn ignition switch OFF and wait at least 10 seconds.	A
2. Turn ignition switch ON.	
 Turn ignition switch OFF and wait at least 10 seconds. Turn ignition switch ON. 	EC
5. Select Service \$0A with GST.	
Is any permanent DTC detected?	0
YES >> GO TO 1.	С
NO >> END	
	D
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< DTC/CIRCUIT DIAGNOSIS >

DTC/CIRCUIT DIAGNOSIS **TROUBLE DIAGNOSIS - SPECIFICATION VALUE**

Description

INFOID:000000011939720

INFOID:000000011939721

[VQ35DE]

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)
- MAS 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 (0.983 1.043 bar, 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

With CONSULT

NOTE:

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

- Perform basic inspection. Refer to <u>EC-164, "Work Procedure"</u>.
 Select "B/FUEL SCHDL", "A/F ALPHA-B1", "A/F ALPHA-B2" and "MAS AIR FLOW SENSOR (Hz)" in "SPEC" of "DATA MONITOR" mode with CONSULT.
- Check that monitor items are within the SP value. 3

Is the measurement value within the SP value?

- YES >> INSPECTION END
- >> Proceed to EC-183, "Diagnosis Procedure". NO

< DTC/CIRCUIT DIAGNOSIS >

Diagnosis Procedure



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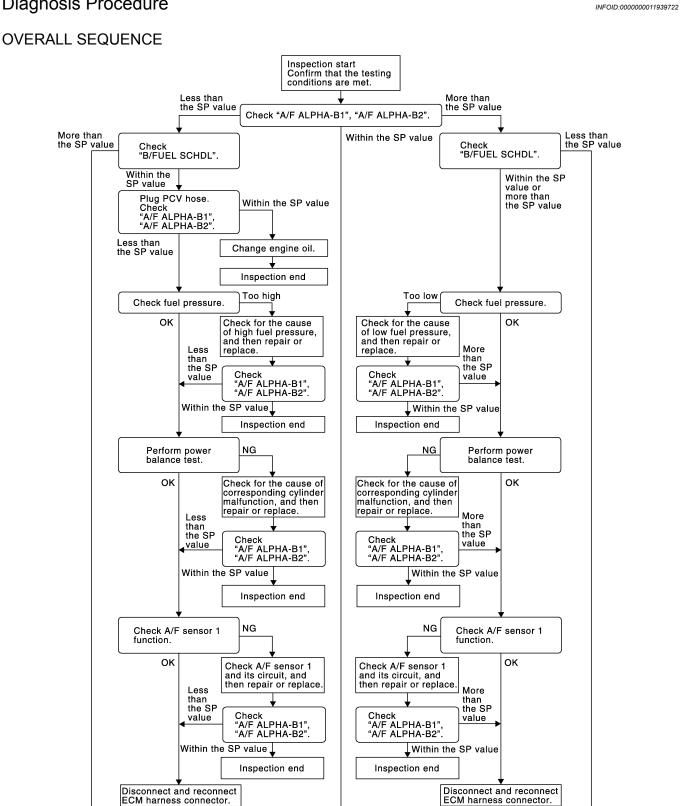
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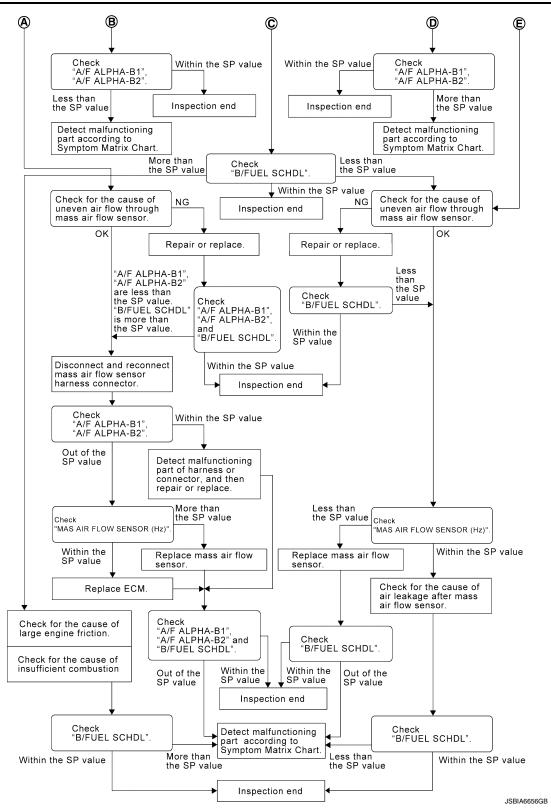
à

ECM harness connector.

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< DTC/CIRCUIT DIAGNOSIS >



DETAILED PROCEDURE

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-182, "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.

EC-184

< DTC/CIRCUIT DIAGNOSIS > [VQ35DE	J
NOTE: Check "A/F ALPHA-B1", "A/F ALPHA-B2" for approximately 1 minute because they may fluctuate. It is No if the indication is out of the SP value even a little.	- Э д
Is the measurement value within the SP value?	
YES >> GO TO 17. NO-1 >> Less than the SP value: GO TO 2. NO-2 >> More than the SP value: GO TO 3.	EC
2. CHECK "B/FUEL SCHDL"	С
Select "B/FUEL SCHDL" in "SPEC" of "DATA MONITOR" mode, and check that the indication is within the S	
value.	
Is the measurement value within the SP value?	D
YES >> GO TO 4. NO >> More than the SP value: GO TO 19.	
NO >> More than the SP value: GO TO 19. 3.CHECK "B/FUEL SCHDL"	E
	-
Select "B/FUEL SCHDL" in "SPEC" of "DATA MONITOR" mode, and check that the indication is within the S value.	
Is the measurement value within the SP value?	F
YES >> GO TO 6.	
NO-1 >> More than the SP value: GO TO 6. NO-2 >> Less than the SP value: GO TO 25.	C
4. CHECK "A/F ALPHA-B1", "A/F ALPHA-B2"	
 Stop the engine. Disconnect PCV hose, and then plug it. 	
 Start engine. Select "A/F ALPHA-B1", "A/F ALPHA-B2" in "SPEC" of "DATA MONITOR" mode, and check that eac indication is within the SP value. 	h I
Is the measurement value within the SP value?	
YES >> GO TO 5.	J
NO >> GO TO 6.	
5. CHANGE ENGINE OIL	- k
 Stop the engine. Change engine oil. NOTE: 	r
This symptom may occur when a large amount of gasoline is mixed with engine oil because of drivin conditions (such as when engine oil temperature does not rise enough since a journey distance is to short during winter). The symptom will not be detected after changing engine oil or changing driving cor ditions.	0
	N
>> INSPECTION END	
6.CHECK FUEL PRESSURE	Ν
Check fuel pressure. (Refer to EC-168, "Work Procedure".)	—
Is the inspection result normal?	C
YES >> GO TO 9.	С
 NO-1 >> Fuel pressure is too high: Replace "fuel filter and fuel pump assembly", refer to <u>FL-5, "Remova and Installation"</u>, and then GO TO 8. NO-2 >> Fuel pressure is too low: GO TO 7. 	<u>ai</u> F
7. DETECT MALFUNCTIONING PART	
Check fuel hoses and fuel tubes for clogging.	_
Is the inspection result normal?	
YES >> Replace "fuel filter and fuel pump assembly", refer to <u>FL-5, "Removal and Installation"</u> , and the	n
GO TO 8.	

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

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< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

8. 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 >> GO TO 9.

9.PERFORM POWER BALANCE TEST

1. Perform "POWER BALANCE" in "ACTIVE TEST" mode.

2. Check that the each cylinder produces a momentary engine speed drop.

Is the inspection result normal?

YES >> GO TO 12. NO >> GO TO 10.

10. DETECT MALFUNCTIONING PART

Check the following below.

- Ignition coil and its circuit (Refer to EC-555, "Component Function Check".)
- Fuel injector and its circuit (Refer to EC-550, "Component Function Check".)
- Intake air leakage
- Low compression pressure (Refer to EM-24, "On-Vehicle Service".)

Is the inspection result normal?

- YES >> Replace fuel injector, refer to EM-46, "Removal and Installation", and then GO TO 11.
- NO >> Repair or replace malfunctioning part and then GO TO 11.
- **11.**CHECK "A/F ALPHA-B1", "A/F ALPHA-B2"
- 1. Start engine.
- 2. Select "A/F ALPHA-B1", "A/F ALPHA-B2" in "SPEC" of "DATA MONITOR" mode, and check that each indication is within the SP value.

Is the measurement value within the SP value?

- YES >> INSPECTION END
- NO >> GO TO 12.
- 12.CHECK A/F SENSOR 1 FUNCTION

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

- For DTC P0130, P0150, refer to EC-252, "DTC Description".
- For DTC P0131, P0151, refer to <u>EC-256, "DTC Description"</u>.
- For DTC P0132, P0152, refer to <u>EC-259, "DTC Description"</u>.
- For DTC P014C, P014D, P014E, P014F, P015A, P015B, P015C, P015D, refer to <u>EC-282, "DTC Description"</u>.
- For DTC P2096, P2097, P2098, P2099, refer to <u>EC-497, "DTC Description"</u>.

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

Is the measurement value within the SP value?

YES >> INSPECTION END

NO >> GO TO 15.

<pre></pre>	
15. DISCONNECT AND RECONNECT ECM HARNESS CONNECTOR	_
 Stop the engine. Disconnect ECM harness connector. Check pin terminal and connector for damage, and then reconnect it. 	A
>> GO TO 16. 16. CHECK "A/F ALPHA-B1", "A/F ALPHA-B2"	EC
 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. 	С
<u>Is the measurement value within the SP value?</u> YES >> INSPECTION END NO >> Detect malfunctioning part according to <u>EC-575, "Symptom Table"</u> .	D
17. CHECK "B/FUEL SCHDL"	E
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?	F
YES >> INSPECTION END NO-1 >> More than the SP value: GO TO 18. NO-2 >> Less than the SP value: GO TO 25.	G
 18.DETECT MALFUNCTIONING PART Check for the cause of large engine friction. Refer to the following. 	Н
 Engine oil level is too high Engine oil viscosity Belt tension of power steering, alternator, A/C compressor, etc. is excessive 	I
 Noise from engine Noise from transmission, etc. Check for the cause of insufficient combustion. Refer to the following. Valve clearance malfunction 	J
 Intake valve timing control function malfunction Camshaft sprocket installation malfunction, etc. 	K
>> Repair or replace malfunctioning part, and then GO TO 30.	
 19.CHECK INTAKE SYSTEM Check for the cause of uneven air flow through mass air flow sensor. Refer to the following. Crushed air ducts 	L
 Malfunctioning seal of air cleaner element Uneven dirt of air cleaner element Improper specification of intake air system 	Μ
Is the inspection result normal?	Ν
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	0
check that each indication is within the SP value. <u>Is the measurement value within the SP value?</u>	Р
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.	1
21. DISCONNECT AND RECONNECT MASS AIR FLOW SENSOR HARNESS CONNECTOR	

1. Stop the engine.

< DTC/CIRCUIT DIAGNOSIS >

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"

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

Is the measurement value within the SP value?

YES >> Detect malfunctioning part of mass air flow sensor circuit and repair it. Refer to <u>EC-227. "Diagno-</u> <u>sis Procedure"</u>. Then GO TO 29.

NO >> GO TO 23.

23. CHECK "MAS AIR FLOW SENSOR (HZ)"

Select "MAS 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 24.

NO >> More than the SP value: Replace mass air flow sensor, refer to <u>EM-26, "Removal and Installa-</u> tion", and then GO TO 29.

24.REPLACE ECM

Replace ECM. Refer to EC-586, "Removal and Installation".

>> GO TO 29.

25.CHECK INTAKE SYSTEM

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

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

Is the inspection result normal?

YES >> GO TO 27.

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

26.CHECK "B/FUEL SCHDL"

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

Is the measurement value within the SP value?

YES >> INSPECTION END

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

27.CHECK "MAS AIR FLOW SENSOR (HZ)"

Select "MAS 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-26. "Removal and Installation"</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
- Open stuck, breakage, hose disconnection, or cracks in PCV valve

[VQ35DE] < DTC/CIRCUIT DIAGNOSIS > 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. EC >> GO TO 30. 29. CHECK "A/F ALPHA-B1", "A/F ALPHA-B2", AND "B/FUEL SCHDL" Select "A/F ALPHA-B1", "A/F ALPHA-B2", and "B/FUEL SCHDL" in "SPEC" of "DATA MONITOR" mode, and check that each indication is within the SP value. Is the measurement value within the SP value? YES >> INSPECTION END NO >> Detect malfunctioning part according to EC-575, "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-575, "Symptom Table".

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< DTC/CIRCUIT DIAGNOSIS >

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

1.CHECK FUSE

Check that there is no blowout in the following fuses.

Location	Fuse No.	Capacity
	#39	10 A
IPDM E/R	#42	10 A
	#56	10 A

Is the fuse fusing?

YES >> Replace the fuse after repairing the applicable circuit.

NO >> GO TO 2.

2. CHECK GROUND CONNECTION

- 1. Turn ignition switch OFF.
- 2. Check ground connection E9. Refer to PG-70, "Harness Layout".

Is the inspection result normal?

YES >> GO TO 3.

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.

	+				
E	СМ	_	Continuity		
Connector	Terminal	•			
	147				
E10	149	149	Existed		
	152				
F13	10	Ground			
FIS	55				
F14	105	†			
Г 14	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	
E10	145	152	Battery voltage

Is the inspection result normal?

YES >> GO TO 6.

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NO >	> GO TO 5	5.						
CHECK		WER SUPF	PLY (MA	IN) CIRC				/
	gnition swi	tch OFF. I harness c	onnector	re				
. Discor	nnect IPDN	I E/R harne	ess conn	nector.				E
. Check	the contin	uity betwee	en ECM	harness	connector and IPDM E/R harness con	nector.		
	+							(
	ECM		IPDM E/	R	Continuity			
Connector	-	al Conne		Terminal				
E10	145	F5	0	59	Existed			
Also c	heck harne	ess for sho	rt to grou	und.	<u></u>			
		<u>ult normal?</u>						
YES >: NO >:	> Perform	the trouble r replace er	diagnos	is for pow	ver supply circuit.			
	•	WER SUPF		•	3.			
		tch OFF an			seconds			
Check	the voltag	je between	ECM ha	arness co	nnector terminals as per the following			(
	_							
	ECM	1	_				Voltage	
Connector	+	-	Condition			(Approx.)		
E10	145	minal	After tur	After turning ignition switch OFF, battery voltage will exist for a few seconds Drop to 0 V				
	145	152	Aller lui	ming ignitio				
the inen	option root	ut normal?			in Switch Of 1, ballery voltage will exist for a rev	00001100	2.00 10 0 1	
-		ult normal?			in switch of t, ballery volage will exist for a few			
YES >	ection resu > GO TO 9 > GO TO 7	9.			in switch of t, battery voltage will exist for a few			
YES > NO >	> GO TO 9 > GO TO 7	9.	ROL SIG	GNAL	n switch of t, battery voltage will exist for a few			
YES > NO > .CHECK	> GO TO 9 > GO TO 7 (ECM REI	9. 7. LAY CONTI			ctor terminals as per the following.			
YES > NO > CHECK	> GO TO 9 > GO TO 7 (ECM REI voltage be	9. 7. LAY CONTI etween ECN						
YES > NO > CHECK heck the	> GO TO 9 > GO TO 7 C ECM REI voltage be	9. 7. LAY CONTI			ctor terminals as per the following.	Voltage		
YES > NO > CHECK heck the	> GO TO 9 > GO TO 7 (ECM REI voltage be E0	9. 7. LAY CONTI etween ECN CM	M harnes	ss conneo				
YES > NO > .CHECk heck the	> GO TO 9 > GO TO 7 C ECM REI voltage be	9. 7. LAY CONTI etween ECN			ctor terminals as per the following. Condition	Voltage (Approx		
YES > NO > .CHECk heck the	> GO TO 9 > GO TO 7 (ECM REI voltage be E0	9. 7. LAY CONTI etween ECN CM	M harnes	Ignition	ctor terminals as per the following. Condition	Voltage (Approx 0 V	2 .)	
YES > NO > CHECK heck the Connector F14	> GO TO S > GO TO 7 C ECM REI voltage be EC + Terminal 86	9. 7. LAY CONTI Etween ECM CM Connector E10	M harnes	Ignition	ctor terminals as per the following. Condition	Voltage (Approx	2 .)	
YES > NO > CHECK heck the Connector F14 the insp YES >	> GO TO 9 > GO TO 7 C ECM REI voltage be EC + Terminal 86 ection results	9. 7. LAY CONTI etween ECN CM Connector E10 ult normal?	M harnes	Ignition	ctor terminals as per the following. Condition	Voltage (Approx 0 V	2 .)	
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YES > NO > CHECK heck the Connector F14 the insp YES > NO >	> GO TO S > GO TO S > GO TO TO C ECM REI voltage be EC voltage be EC voltage be EC voltage be EC voltage be EC * * * * * * * * * * * * * * * * * *	9. 7. LAY CONTI etween ECN CM Connector E10 ult normal? itermittent in	M harnes Terminal 152 ncident.	Ignition Turn igr	ctor terminals as per the following. Condition switch ON nition switch OFF and wait at least 10 seconds. GI-41, "Intermittent Incident".	Voltage (Approx 0 V	2 .)	I
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YES > NO > CHECk Check the Connector F14 Sthe insport YES > NO > CHECk Turn ig Discor Discor Check	> GO TO S > GO TO S > GO TO 7	9. 7. LAY CONTI etween ECM CM Connector E10 LAY CONTI thermittent in 3. LAY CONTI tch OFF. I harness co M E/R harnes huity betweet	M harnes Terminal 152 ncident. ROL SIG onnector ess conn en ECM	R	Condition Switch ON ition switch OFF and wait at least 10 seconds. GI-41. "Intermittent Incident". RCUIT	Voltage (Approx 0 V Battery vol	2 .)	4 1 7 7 7
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5. Also check harness for short to ground and to power.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to PCS-36, "Removal and Installation".

NO >> Repair or replace error-detected parts.

9. CHECK IGNITION SWITCH SIGNAL

- 1. Turn ignition switch ON.
- 2. Check the voltage between ECM harness connector terminals.

	ECM				
Connector	+	-	Condition	Voltage (Approx.)	
Connector	Terminal			(
E10	133	152	Ignition switch OFF	0 V	
	155	152	Ignition switch ON	Battery voltage	

Is the inspection result normal?

YES >> GO TO 11.

NO >> GO TO 10.

10. CHECK IGNITION SWITCH 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.

+		+ –				
ECM		IPDM E/R		Continuity		
Connector	Terminal	Connector				
E10	133	E19	21	Existed		

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

Is the inspection result normal?

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

NO >> Repair or replace error-detected parts.

11.CHECK ECM POWER SUPPLY (BACK-UP)

Check the voltage between ECM harness connector terminals.

	E			
	+		_	Voltage
Connector	Terminal	Connector Terminal		
F14	116	E10	152	Battery voltage

Is the inspection result normal?

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

NO >> GO TO 12.

12. CHECK ECM POWER SUPPLY (BACK-UP) 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.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

-	ŀ	-	-	
EC	CM	IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
F14	116	F50	58	Existed
		for short to g	round.	
s the inspec				
YES >> NO >>	Repair or re	trouble diagr place error-de	etected part	ver supply ci s.

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U0101 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 Description

INFOID:000000011939725

DTC DETECTION LOGIC

When ECM is not transmitting or receiving CAN communication signal of OBD (emission-related diagnosis) with TCM for 2 seconds or more.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition			
		Diagnosis condition	Ignition switch ON		
		Signal (terminal)	CAN communication signal		
U0101	LOST COMM (TCM) (Lost Communication with TCM)	Threshold	ECM is not transmitting or receiving CAN communication signal of OBD (emission-re-lated diagnosis) with TCM.		
		Diagnosis delay time	2 seconds or more		

POSSIBLE CAUSE

- CAN communication line between TCM and ECM
- CAN communication line open or shorted

FAIL-SAFE

Engine operating condition in fail-safe mode		
Fail safe mode	Vehicle behavior	
CAN communication line	ECM operates active grille shutter to fully-open position.	

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

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

Is DTC detected?

YES >> Proceed to EC-194, "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:000000011939726

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

INFOID:000000011939724

< DTC/CIRCUIT DIAGNOSIS >

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 Description

DTC DETECTION LOGIC

When ECM is not transmitting or receiving CAN communication signal of OBD (emission related diagnosis) for 2 seconds or more.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		F
		Diagnosis condition	Ignition switch ON	
		Signal (terminal)	CAN communication signal	0
U1000	CAN COMM CIRCUIT (CAN COMM CIRCUIT)	Threshold	ECM is not transmitting or receiving CAN communication signal of OBD (emission related diagnosis)	G
_		Diagnosis delay time	2 seconds or more	Н

POSSIBLE CAUSE

Harness and connectors (CAN communication line is open or shorted)

FAIL-SAFE

Not applicable

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 EC-195, "Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-41, "Intermittent Incident"</u>.
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

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

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INFOID:0000000011939732

INFOID:000000011939730

INFOID:000000011939731

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U1001 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 Description

INFOID:000000012444540

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
	U1001 CAN COMM CIRCUIT (CAN COMM CIRCUIT)	Diagnosis condition	Ignition switch ON
		Signal (terminal)	CAN communication signal
U1001		Threshold	ECM is not receiving CAN communication signal from ADAS control unit
		Diagnosis delay time	2 seconds or more

POSSIBLE CAUSE

Harness and connectors (CAN communication line is open or shorted)

FAIL-SAFE

Not applicable

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 EC-196, "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:000000012444541

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

INFOID:000000012444539

< DTC/CIRCUIT DIAGNOSIS >

P0011, P0021 IVT CONTROL

DTC Description

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INFOID:000000011939737

[VQ35DE]

DTC DETECTION LOGIC

There is a gap between angle of target and phase-control angle degree.

DTC	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition
	Diagnosis condition	-	
	P0011 INT/V TIM CONT-B1 ("A" Camshaft Position - Timing Over- Advanced or System Performance bank 1)	Signal (terminal)	-
P0011		Threshold	There is a gap between angle of target and phase-control angle degree
		Diagnosis delay time	_
	Diagnosis condition	_	
	INT/V TIM CONT-B2	Signal (terminal)	-
	("B" Camshaft Position - Timing Over- Advanced or System Performance bank 2)	Threshold	There is a gap between angle of target and phase-control angle degree
		Diagnosis delay time	-

POSSIBLE CAUSE

- 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

FAIL-SAFE

	Engine operating condition in fail-safe mode	
Fail safe mode	Vehicle behavior	
Intake valve timing control	 The signal is not energized to the intake valve timing control solenoid valve and the valve control does not function. ECM activates the IVT intermediate lock control solenoid valve to bring the cam sprocket into an intermediate lock condition. 	

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0011 or P0021 is displayed with DTC P0075 or P0081, first perform the trouble diagnosis for DTC P0075 or P0081.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable.

- DTC P0075: Refer to EC-213, "DTC Description".
- DTC P0081: Refer to <u>EC-213</u>, "<u>DTC Description</u>".
- NO >> GO TO 2.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following before conduct- P 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:

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

< DTC/CIRCUIT DIAGNOSIS >

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE-I

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. Maintain the following conditions for at least 6 consecutive seconds. Hold the accelerator pedal as steady as possible.

ENG SPEED	1,200 - 2,000 rpm
COOLANT TEMP/S	More than 60°C (140°F)
B/FUEL SCHDL	More than 6.0 msec
Selector lever	D position

CAUTION:

Always drive at a safe speed.

- 4. Stop vehicle with engine running and let engine idle for 10 seconds.
- 5. Check 1st trip DTC.

With GST

Follow the procedure "With CONSULT" above.

Is 1st trip DTC detected?

YES >> Proceed to EC-198. "Diagnosis Procedure"

NO >> GO TO 4.

4.PERFORM DTC CONFIRMATION PROCEDURE-II

(B) With CONSULT

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

ENG SPEED	1,200 - 3,175 rpm (A constant rotation is maintained.)
COOLANT 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?

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:000000011939738

1.CHECK DTC PRIORITY

If DTC P0011 or P0021 is displayed with DTC P0075 or P0081, first perform the trouble diagnosis for DTC P0075 or P0081.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable.
 - DTC P0075: Refer to EC-213, "DTC Description".
 - DTC P0081: Refer to <u>EC-213, "DTC Description"</u>.

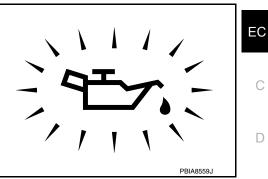
NO >> GO TO 2.

P0011, P0021 IVT CONTROL

< DTC/CIRCUIT DIAGNOSIS >

2. CHECK OIL PRESSURE WARNING LAMP

- 1. Start engine.
- 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</u>, "Inspection".
- NO >> GO TO 3.



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3. CHE	CK INTAKE VALVE TIMING CONTROL SOLENOID VALVE
Check i	ntake valve timing control solenoid valve. Refer to EC-200, "Component Inspection".
<u>Is the ir</u>	spection result normal?
YES NO	>> GO TO 4. >> Replace malfunctioning intake valve timing control solenoid valve. Refer to <u>EM-55</u> , " <u>Exploded</u> <u>View</u> ".
4. CHE	CK CRANKSHAFT POSITION SENSOR (POS)
	crankshaft position sensor (POS). Refer to EC-328, "Component Inspection".
	spection result normal?
YES NO	>> GO TO 5. >> Replace crankshaft position sensor (POS). Refer to <u>EM-39, "Exploded View"</u> .
-	CK CAMSHAFT POSITION SENSOR (PHASE)
	camshaft position sensor (PHASE). Refer to EC-334, "Component Inspection".
	spection result normal?
YES	>> GO TO 6.
NO	>> Replace malfunctioning camshaft position sensor (PHASE). Refer to EM-51, "Exploded View".
D. CHE	CK CAMSHAFT (INTAKE)
Check	he following.
Check f • Accur	he following. nulation of debris on the signal plate of camshaft rear end
Check f • Accur • Chipp	he following. nulation of debris on the signal plate of camshaft rear end ing signal plate of camshaft rear end
Check f • Accur • Chipp <u>Is the in</u> YES	he following. nulation of debris on the signal plate of camshaft rear end ing signal plate of camshaft rear end spection result normal? >> GO TO 7.
Check f • Accur • Chipp Is the ir	he following. nulation of debris on the signal plate of camshaft rear end ing signal plate of camshaft rear end <u>spection result normal?</u> >> GO TO 7. >> Remove debris and clean the signal plate of camshaft
Check f • Accur • Chipp <u>Is the in</u> YES	he following. nulation of debris on the signal plate of camshaft rear end ing signal plate of camshaft rear end spection result normal? >> GO TO 7.
Check f • Accur • Chipp <u>Is the ir</u> YES	he following. nulation of debris on the signal plate of camshaft rear end ing signal plate of camshaft rear end <u>spection result normal?</u> >> GO TO 7. >> Remove debris and clean the signal plate of camshaft rear end or replace camshaft. Refer to <u>EM-79, "Removal</u>
Check f • Accur • Chipp <u>Is the ir</u> YES	he following. nulation of debris on the signal plate of camshaft rear end ing signal plate of camshaft rear end <u>spection result normal?</u> >> GO TO 7. >> Remove debris and clean the signal plate of camshaft rear end or replace camshaft. Refer to <u>EM-79, "Removal</u>
Check f • Accur • Chipp <u>Is the ir</u> YES NO	he following. nulation of debris on the signal plate of camshaft rear end ing signal plate of camshaft rear end <u>spection result normal?</u> >> GO TO 7. >> Remove debris and clean the signal plate of camshaft rear end or replace camshaft. Refer to EM-79, "Removal and Installation".
Check f • Accur • Chipp <u>Is the ir</u> YES NO	he following. nulation of debris on the signal plate of camshaft rear end ing signal plate of camshaft rear end <u>spection result normal?</u> >> GO TO 7. >> Remove debris and clean the signal plate of camshaft rear end or replace camshaft. Refer to <u>EM-79, "Removal</u> and Installation".
Check f • Accur • Chipp <u>Is the ir</u> YES NO 7. CHE	he following. nulation of debris on the signal plate of camshaft rear end ing signal plate of camshaft rear end <u>spection result normal?</u> >> GO TO 7. >> Remove debris and clean the signal plate of camshaft rear end or replace camshaft. Refer to EM-79, "Removal and Installation".
Check f • Accur • Chipp <u>Is the ir</u> YES NO 7 .CHE Check s	he following. nulation of debris on the signal plate of camshaft rear end <u>spection result normal?</u> >> GO TO 7. >> Remove debris and clean the signal plate of camshaft rear end or replace camshaft. Refer to <u>EM-79, "Removal</u> and Installation". CK TIMING CHAIN INSTALLATION service records for any recent repairs that may cause timing chain misalignment. re any service records that may cause timing chain misalignment?
Check f • Accur • Chipp <u>Is the ir</u> YES NO 7.CHE Check s <u>Are the</u> YES	he following. nulation of debris on the signal plate of camshaft rear end <u>spection result normal?</u> >> GO TO 7. >> Remove debris and clean the signal plate of camshaft rear end or replace camshaft. Refer to EM-79. "Removal and Installation". CK TIMING CHAIN INSTALLATION Service records for any recent repairs that may cause timing chain misalignment. te any service records that may cause timing chain misalignment? >> Check timing chain installation. Refer to EM-66, "Removal and Installation".
Check f • Accur • Chipp <u>Is the ir</u> YES NO <u>YES</u> <u>Are the</u> YES NO	he following. nulation of debris on the signal plate of camshaft rear end <u>spection result normal?</u> >> GO TO 7. >> Remove debris and clean the signal plate of camshaft rear end or replace camshaft. Refer to <u>EM-79, "Removal</u> and Installation". CK TIMING CHAIN INSTALLATION service records for any recent repairs that may cause timing chain misalignment. re any service records that may cause timing chain misalignment?

Check lubrication circuit. Refer to <u>LU-8, "Inspection</u>

Is the inspection result normal?

YES >> INSPECTION END

P0011, P0021 IVT CONTROL

< DTC/CIRCUIT DIAGNOSIS >

NO >> Clean lubrication line.

Component Inspection

INFOID:000000011939739

[VQ35DE]

1. CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE-I

- 1. Turn ignition switch OFF.
- 2. Disconnect intake valve timing control solenoid valve harness connector.
- 3. Check resistance between intake valve timing control solenoid valve terminals as per the following.

	timing control id valve	Conditio	n	
+	_			Resistance
Terr	ninal			
1	2			7.0 – 7.8 Ω
1		Temperature	20°C (68°F)	8
2	Ground			(Continuity should not exist)

Is the inspection result normal?

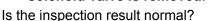
YES >> GO TO 2.

2. CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE-II

- 1. Remove intake valve timing control solenoid valve. Refer to <u>EM-55</u>, "Exploded View".
- 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.



YES >> INSPECTION END

NO >> Replace malfunctioning intake valve timing control solenoid valve. Refer to <u>EM-55</u>, "<u>Exploded</u> <u>View</u>".

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NO >> Replace malfunctioning intake valve timing control solenoid valve. Refer to <u>EM-55</u>, "<u>Exploded</u> <u>View</u>".

< DTC/CIRCUIT DIAGNOSIS >

P0014, P0024 EVT CONTROL

DTC Description

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INFOID:000000011939740

[VQ35DE]

DTC DETECTION LOGIC

There is a gap between angle of target and phase-control angle degree.

DTC	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition
	Diagnosis condition	-	
	P0014 EXH/V TIM CONT-B1 [Exhaust valve timing control perfor- mance (bank 1)]	Signal (terminal)	-
P0014		Threshold	There is a gap between angle of target and phase-control angle degree
		Diagnosis delay time	_
		Diagnosis condition	_
	EXH/V TIM CONT-B2	Signal (terminal)	-
-	[Exhaust valve timing control perfor- mance (bank 2)]	Threshold	There is a gap between angle of target and phase-control angle degree
		Diagnosis delay time	-

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

FAIL-SAFE

Engine operating condition in fail-safe mode		
Fail safe mode	Vehicle behavior	K
Exhaust valve timing control	The signal is not energized to the exhaust valve timing control magnet retarder and the magnet retarder control does not function.	

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.
 N

 • DTC P0078: Refer to EC-218, "DTC Description".
 • DTC P0084: Refer to EC-218, "DTC Description".

 • DTC P1078: Refer to EC-430, "DTC Description".
 • DTC P1078: Refer to EC-430, "DTC Description".

 • DTC P1084: Refer to EC-430, "DTC Description".
 • O

 • 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:

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

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

(I) 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.

ENG SPEED	500 – 2,000 rpm (A constant rotation is maintained)
COOLAN TEMP/S	More than 20°C (68°F)
Selector lever	P or N position

4. Let engine idle for 10 seconds.

5. Check 1st trip DTC.

With GST

Follow the procedure "With CONSULT" above.

Is 1st trip DTC detected?

YES >> Proceed to EC-202, "Diagnosis Procedure"

NO >> GO TO 4.

4.PERFORM DTC CONFIRMATION PROCEDURE - 2

With CONSULT

1. Select "DATA MONITOR" mode of "ENGINE" using CONSULT.

2. 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 required for this test.)

CAUTION:

Always drive vehicle at a safe speed.

3. Check 1st trip DTC.

With GST

Follow the procedure "With CONSULT" above.

Is 1st trip DTC detected?

- YES >> Proceed to EC-202. "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:000000011939741

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 EC-218, "DTC Description".
 - DTC P0084: Refer to <u>EC-218</u>, "DTC Description".

EC-202

P0014, P0024 EVT CONTROL	
<pre>< DTC/CIRCUIT DIAGNOSIS ></pre>	A
 2.CHECK ENGINE OIL PRESSURE WARNING LAMP 1. Start the engine. 2. Check that engine oil pressure warning lamp is not illuminated. 	EC
2. Check that engine on pressure warning lamp is not indiminated. <u>Is engine oil pressure warning lamp illuminated?</u> YES >> Proceed to <u>LU-8, "Inspection"</u> . NO >> GO TO 3.	С
	D
3.CHECK EXHAUST VALVE TIMING CONTROL SOLENOID VALVE	F
Check exhaust valve timing control solenoid valve. Refer to <u>EC-206</u> , "Component Inspection (Exhaust Valve <u>Timing Control Solenoid Valve</u>)".	
Is the inspection result normal?	G
 YES >> GO TO 4. NO >> Replace malfunctioning exhaust valve timing control solenoid valve. Refer to <u>EM-55</u>, "Exploded <u>View"</u>. 	Н
4. CHECK EXHAUST VALVE TIMING CONTROL POSITION SENSOR	
Check exhaust valve timing control position sensor. Refer to <u>EC-205. "Component Inspection (Exhaust Valve</u> Timing Control Position Sensor)".	I
<u>Is the inspection result normal?</u> YES >> GO TO 5.	
 NO >> Replace malfunctioning exhaust valve timing control position sensor. Refer to <u>EM-55</u>, "Exploded <u>View"</u>. 	J
5. CHECK CRANKSHAFT POSITION SENSOR	K
Check crankshaft position sensor. Refer to <u>EC-205. "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".	L
NO >> Replace crankshaft position sensor. Refer to <u>EM-39, "Exploded View"</u> . 6.CHECK CAMSHAFT POSITION SENSOR	
Check camshaft position sensor. Refer to EC-204, "Component Inspection (Camshaft Position Sensor)".	M
Is the inspection result normal?	
 YES >> GO TO 7. NO >> Replace malfunctioning camshaft position sensor. Refer to <u>EM-51, "Exploded View"</u>. 	Ν
7. CHECK CAMSHAFT (EXH)	
Check the following.	0

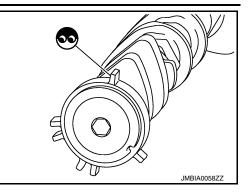
Ρ

< 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 8.
- NO >> Remove debris and clean the signal plate of camshaft rear end or replace camshaft. Refer to <u>EM-79, "Removal and Installation"</u>.



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 <u>EM-66, "Removal and Installation"</u>.

NO >> GO TO 9.

9. CHECK LUBRICATION CIRCUIT

Perform "Inspection of Camshaft Sprocket (EXT) Oil Groove". Refer to <u>EM-86. "Inspection after Installation"</u>. <u>Is the inspection result normal?</u>

- YES >> INSPECTION END
- NO >> Clean lubrication line.

Component Inspection (Camshaft Position Sensor)

INFOID:0000000011939742

[VQ35DE]

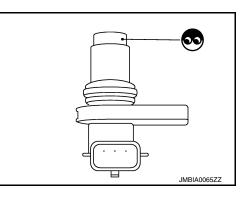
1.CHECK CAMSHAFT POSITION SENSOR (PHASE) - 1

- 1. Turn ignition switch OFF.
- 2. Loosen the fixing bolt of the sensor.
- 3. Disconnect camshaft position sensor (PHASE) harness connector.
- 4. Remove the sensor. Refer to <u>EM-51, "Exploded View"</u>.
- 5. Visually check the sensor for chipping.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace malfunctioning camshaft position sensor (PHASE). Refer to <u>EM-51, "Exploded View"</u>.



2.CHECK CAMSHAFT POSITION SENSOR (PHASE) - 2

Check resistance camshaft position sensor (PHASE) terminals as follows.

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

Is the inspection result normal?

YES >> INSPECTION END

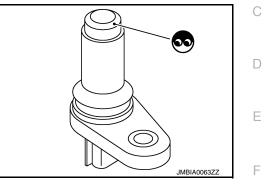
NO >> Replace malfunctioning camshaft position sensor (PHASE). Refer to EM-51, "Exploded View".

< DTC/CIRCUIT DIAGNOSIS >

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. Refer to EM-39, "Exploded View".
- 5. Visually check the sensor for chipping.
- Is the inspection result normal?
- YES >> GO TO 2.
- 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 position sensor + Condition Resistance Н Terminals 2 1 1 3 Temperature 25°C (77°F) Except 0 Ω or ∞ 2 3 Is the inspection result normal? YES >> INSPECTION END >> Replace crankshaft position sensor (POS). Refer to EM-39, "Exploded View". NO Component Inspection (Exhaust Valve Timing Control Position Sensor) Κ INFOID:000000011939744 1. EXHAUST VALVE TIMING CONTROL POSITION SENSOR - 1 1. Turn ignition switch OFF. Disconnect exhaust valve timing control position sensor harness connector. 3. Loosen the fixing bolt of the sensor. Remove the sensor. Refer to EM-51, "Exploded View". M 4. 5. Visually check the sensor for chipping. Is the inspection result normal? 00 YES >> GO TO 2. Ν >> Replace malfunctioning exhaust valve timing control NO position sensor. Refer to EM-51, "Exploded View". Ρ JMBIA0065ZZ

2.EXHAUST VALVE TIMING CONTROL POSITION SENSOR - 2

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

[VQ35DE]

INFOID:0000000011939743

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< DTC/CIRCUIT DIAGNOSIS >

Exhaust valve timing control position sensor		Condi			
+	_	-		Resistance	
Terr	ninal				
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 <u>EM-51</u>, "<u>Exploded</u> <u>View</u>".

Component Inspection (Exhaust Valve Timing Control Solenoid Valve)

INFOID:0000000011939745

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.

Exhaust valve timing control solenoid valve		Conditio			
+	_			Resistance	
Terr	ninal				
1	2			7.0 – 7.8 Ω	
1	a 1	Temperature	20°C (68°F)	∞	
2	Ground			(Continuity should not exist)	

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace malfunctioning exhaust valve timing control solenoid valve. Refer to <u>EM-55</u>, "<u>Exploded</u> <u>View</u>".

2. CHECK EXHAUST VALVE TIMING CONTROL SOLENOID VALVE - 2

- 1. Remove intake valve timing control solenoid valve. Refer to EM-55, "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: Always replace O-ring when exhaust valve timing control solenoid valve is removed. Is the inspection result normal? JMBIA0079ZZ YES >> INSPECTION END
 - NO >> Replace malfunctioning exhaust valve timing control solenoid valve. Refer to <u>EM-55</u>, "<u>Exploded</u> <u>View</u>".

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 Description

INFOID:000000011939746

А

EC

DTC DETECTION LOGIC

• Deterioration in A/F sensor 1 heater performance.

• The current amperage in the A/F sensor 1 heater circuit is out of the normal range.

DTC	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition
		Diagnosis condition	Start engine and let it idle
D0020	Air fuel ratio (A/F) sensor 1 heater	Signal (terminal)	Voltage signal transmitted from A/F sensor 1 heater to ECM
P0030	(bank 1) performance	Threshold	Voltage signal is higher/lower than voltage in the normal range
		Diagnosis delay time	—
		Diagnosis condition	Start engine and let it idle
P0031	A/F SEN1 HTR (B1) (HO2S heater control circuit low bank 1	Signal (terminal)	Voltage signal transmitted from A/F sensor 1 heater to ECM
P0031	sensor 1)	Threshold	An excessively low voltage signal is sent to ECM through the A/F sensor 1 heater
		Diagnosis delay time	-
		Diagnosis condition	Start engine and let it idle
D0033	A/F SEN1 HTR (B1) (HO2S heater control circuit high bank 1 sensor 1)	Signal (terminal)	Voltage signal transmitted from A/F sensor 1 heater to ECM
P0032		Threshold	An excessively high voltage signal is sent to ECM through the A/F sensor 1 heater
		Diagnosis delay time	—
		Diagnosis condition	Start engine and let it idle
DOOSE	Air fuel ratio (A/F) sensor 1 heater	Signal (terminal)	Voltage signal transmitted from A/F sensor 1 heater to ECM
P0036	(bank 2) performance	Threshold	Voltage signal is higher/lower than voltage in the normal range
		Diagnosis delay time	—
		Diagnosis condition	Start engine and let it idle
P0051	A/F SEN1 HTR (B2)	Signal (terminal)	Voltage signal transmitted from A/F sensor 1 heater to ECM
F 000 I	(HO2S heater control circuit low bank 2 sensor 1)	Threshold	An excessively low voltage signal is sent to ECM through the A/F sensor 1 heater
		Diagnosis delay time	_
		Diagnosis condition	Start engine and let it idle
P0052	A/F SEN1 HTR (B2)	Signal (terminal)	Voltage signal transmitted from A/F sensor 1 heater to ECM
•	(HO2S heater control circuit high bank 2 sensor 1)	Threshold	An excessively high voltage signal is sent to ECM through the A/F sensor 1 heater
		Diagnosis delay time	_

POSSIBLE CAUSE

P0030

• Harness or connectors (The A/F sensor 1 heater circuit is open or shorted.)

• The A/F sensor 1 heater

P0031

- < DTC/CIRCUIT DIAGNOSIS >
- Harness or connectors (The A/F sensor 1 heater circuit is open or shorted.)
- The A/F sensor 1 heater

P0032

- Harness or connectors (The A/F sensor 1 heater circuit is shorted.)
- The A/F sensor 1 heater

P0036

- Harness or connectors (The A/F sensor 1 heater circuit is open or shorted.)
- The A/F sensor 1 heater

P0051

- Harness or connectors (The A/F sensor 1 heater circuit is open or shorted.)
- The A/F sensor 1 heater

P0052

- Harness or connectors (The A/F sensor 1 heater circuit is shorted.)
- The A/F sensor 1 heater

FAIL-SAFE

Not applicable

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 EC-208, "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:000000011939747

IVQ35DE1

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.

		+				
DTC		A/F sensor 1	_	Voltage		
	Bank	Connector	Terminal			
P0030, P0031, P0032	1	F12	1	Ground	Battery voltage	
P0036, P0051, P0052	2	F61	1		Dattery 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

P0030, P0031, P0032, P0036, P0051, P0052 A/F SENSOR 1 HEATER [VQ35DE]

< DTC/CIRCUIT DIAGNOSIS >

- 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	
P0030, P0031, P0032	1	F12	1	F50	52	Existed	
P0036, P0051, P0052	2	F61	1	F30	53	EXISTED	
s the inspection resu	<u>Ilt normal?</u>		·	· · · · · · · · · · · · · · · · · · ·			
YES >> Perform NO >> Repair of CHECK A/F SENS	r replace ei SOR 1 HEA	ror-detected	d parts.				
 Turn ignition swit Disconnect ECM Check harness c 	harness co		sensor 1 ha	rness conne	ector and E	CM harness connector.	
DTO		A/F sensor 1		EC	M		
DTC	Bank	Connector	Terminal	Connector	Terminal	Continuity	
P0030, P0031, P0032	1	F12	2	E40	6	Eviated	
P0036, P0051, P0052	2	F61	2	F13	46	Existed	
CHECK A/F SENS	ult normal? 4. pen circuit, SOR 1 HEA neater. Refe	short to gro	und or shor	t to power ir		r connectors.	
s the inspection resurves YES >> GO TO 4 NO >> Repair or I.CHECK A/F SENS Check A/F sensor 1 has the inspection resurves S the inspection resurves YES >> INSPEC NO >> Replace	<u>It normal?</u> pen circuit, SOR 1 HEA neater. Refe It normal? TION END malfunctio <u>, EM-34, "F</u> ection _ RATIO (A ch OFF. sensor 1 ha	short to gro ATER er to <u>EC-209</u> ning air fuel <u>Removal and</u> /F) SENSOF	und or shor a. "Compone ratio (A/F) d Installation R 1 ector.	t to power in ent Inspection sensor 1. F n (bank 1)".	on". Refer to <u>EN</u>	r connectors. 1-32, "Removal and Insta	
s the inspection result YES >> GO TO 4 NO >> Repair of I.CHECK A/F SENS Check A/F sensor 1 It s the inspection result YES >> INSPEC NO >> Replace (bank 2)' Component Insp .CHECK AIR FUEI . Turn ignition swift	<u>It normal?</u> pen circuit, SOR 1 HEA neater. Refe It normal? TION END malfunctio <u>, EM-34, "F</u> ection _ RATIO (A ch OFF. sensor 1 ha	short to gro ATER er to <u>EC-209</u> ning air fuel <u>Removal and</u> /F) SENSOF	und or shor a. "Compone ratio (A/F) d Installation R 1 ector.	t to power in ent Inspection sensor 1. F n (bank 1)".	on". Refer to <u>EN</u>	1-32, "Removal and Insta	
sthe inspection resurves YES >> GO TO 4 NO >> Repair of .CHECK A/F SENS Check A/F sensor 1 Its sthe inspection resurves YES >> INSPEC NO >> Replace (bank 2)' Component Insp .CHECK AIR FUEI . Turn ignition swift . Disconnect A/F sensor	<u>It normal?</u> pen circuit, SOR 1 HEA neater. Refe <u>It normal?</u> TION END malfunctio , <u>EM-34, "f</u> ection _ RATIO (A cch OFF. sensor 1 ha between a	short to gro ATER er to <u>EC-209</u> ning air fuel <u>Removal and</u> /F) SENSOF	und or shor a. "Compone ratio (A/F) d Installation R 1 ector.	t to power in ent Inspection sensor 1. For (bank 1)".	on". Refer to <u>EN</u>	1-32, "Removal and Insta	
the inspection result YES >> GO TO 4 NO >> Repair of CHECK A/F SENS theck A/F sensor 1 h the inspection result YES >> INSPEC NO >> Replace (bank 2)' Component Insp CHECK AIR FUEI Disconnect A/F s Check resistance	<u>It normal?</u> pen circuit, SOR 1 HEA neater. Refe <u>It normal?</u> TION END malfunctio , <u>EM-34, "f</u> ection _ RATIO (A cch OFF. sensor 1 ha between a	short to gro ATER er to <u>EC-209</u> ning air fuel <u>Removal and</u> /F) SENSOF	und or shor a, "Compone ratio (A/F) d Installation R 1 ector. terminals a	t to power in ent Inspection sensor 1. For (bank 1)".	on". Refer to <u>EN</u>	1-32, "Removal and Insta	
the inspection resurves YES >> GO TO 4 NO >> Repair of CHECK A/F SENS heck A/F sensor 1 heck the inspection resurves YES >> INSPEC NO >> Replace (bank 2) COMPONENT INSP CHECK AIR FUEL Turn ignition switt Disconnect A/F sensor + A/F sensor	<u>It normal?</u> pen circuit, SOR 1 HEA neater. Refe <u>It normal?</u> TION END malfunctio , <u>EM-34, "f</u> ection _ RATIO (A cch OFF. sensor 1 ha between a	short to grow ATER er to EC-209 ning air fuel Removal and /F) SENSOF arness conner A/F sensor 1	und or shor a, "Compone ratio (A/F) d Installation R 1 ector. terminals a	t to power in ent Inspection sensor 1. For (bank 1)".	on". Refer to <u>EN</u>	1-32, "Removal and Insta	
the inspection resurves YES >> GO TO 4 NO >> Repair of CHECK A/F SENS Theck A/F sensor 1 h the inspection resurves YES >> INSPEC NO >> Replace (bank 2) COMPONENT INSP CHECK AIR FUEL Turn ignition switt Disconnect A/F sensor + A/F sensor	It normal? pen circuit, SOR 1 HEA neater. Refa It normal? TION END malfunctio (, EM-34, "f ection _ RATIO (A cch OFF. sensor 1 ha between 7 1	short to grow ATER er to EC-209 ning air fuel Removal and /F) SENSOF arness conner A/F sensor 1	und or shor a, "Compone ratio (A/F) d Installation R 1 ector. terminals a Resistance	t to power in ent Inspection sensor 1. For (bank 1)".	on". Refer to <u>EN</u>	1-32, "Removal and Insta	
s the inspection result YES >> GO TO 4 NO >> Repair of .CHECK A/F SENS check A/F sensor 1 h s the inspection result YES >> INSPEC NO >> Replace (bank 2)' Component Insp .CHECK AIR FUEI . Turn ignition swift Disconnect A/F sensor + A/F sensor	It normal? pen circuit, SOR 1 HEA neater. Refu It normal? TION END malfunctio <u>, EM-34, "F</u> ection _ RATIO (A ch OFF. sensor 1 ha between 7 1 1	short to grow ATER er to EC-209 ning air fuel Removal and /F) SENSOF arness conner A/F sensor 1	und or shor a, "Compone ratio (A/F) d Installation R 1 ector. terminals a Resistance	t to power in ent Inspection sensor 1. For (bank 1)".	on". Refer to <u>EN</u>	1-32, "Removal and Insta	
s the inspection result YES >> GO TO 4 NO >> Repair of CHECK A/F SENS Check A/F sensor 1 h s the inspection result YES >> INSPEC NO >> Replace (bank 2)' Component Insp CHECK AIR FUEL Turn ignition swift Disconnect A/F sensor + A/F sensor Terminal	It normal? pen circuit, SOR 1 HEA neater. Refe It normal? TION END malfunctio (, EM-34, "f ection _ RATIO (A cch OFF. sensor 1 ha between 7 1 1 1 3	short to grow ATER er to EC-209 ning air fuel Removal and /F) SENSOF arness conner A/F sensor 1	und or shor a, "Compone ratio (A/F) d Installation R 1 ector. terminals a Resistance 2.44 Ω [at 25°0	t to power in ent Inspection sensor 1. F <u>n (bank 1)"</u> . as per the fo	on". Refer to <u>EN</u>	1-32, "Removal and Insta	

YES >> INSPECTION END

>> Replace malfunctioning air fuel ratio (A/F) sensor 1. Refer to EM-32, "Removal and Installation NO (bank 2)", EM-34, "Removal and Installation (bank 1)".

EC-209

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P0037, P0038, P0057, P0058 HO2S2 HEATER

< DTC/CIRCUIT DIAGNOSIS >

P0037, P0038, P0057, P0058 H02S2 HEATER

DTC Description

INFOID:000000011939749

[VQ35DE]

DTC DETECTION LOGIC

The current amperage in the heated oxygen sensor 2 heater circuit is out of the normal range.

DTC	CONSULT screen terms (Trouble diagnosis content)	DT	C detection condition
		Diagnosis condition	—
	HO2S2 HTR (B1)	Signal (terminal)	Voltage signal transmitted from heated oxy- gen sensor 2 heater to ECM
P0037		Threshold	An excessively low voltage signal is sent to ECM through the heated oxygen sensor 2 heater
		Diagnosis delay time	-
		Diagnosis condition	-
	HO2S2 HTR (B1)	Signal (terminal)	Voltage signal transmitted from heated oxy- gen sensor 2 heater to ECM
P0038	()	Threshold	An excessively high voltage signal is sent to ECM through the heated oxygen sensor 2 heater
		Diagnosis delay time	-
		Diagnosis condition	-
	H02S2 HTR (B2)	Signal (terminal)	Voltage signal transmitted from heated oxy- gen sensor 2 heater to ECM
P0057	(HO2S heater control circuit low bank 2 sensor 2)	Threshold	An excessively low voltage signal is sent to ECM through the heated oxygen sensor 2 heater
		Diagnosis delay time	-
		Diagnosis condition	-
P0058	H02S2 HTR (B2)	Signal (terminal)	Voltage signal transmitted from heated oxy- gen sensor 2 heater to ECM
	(HO2S heater control circuit high bank 2 sensor 2)	Threshold	An excessively high voltage signal is sent to ECM through the heated oxygen sensor 2 heater
		Diagnosis delay time	-

POSSIBLE CAUSE

P0037

- Harness or connectors (The heated oxygen sensor 2 heater circuit is open or shorted.)
- Heated oxygen sensor 2 heater

P0038

- Harness or connectors (The heated oxygen sensor 2 heater circuit is shorted.)
- Heated oxygen sensor 2 heater

P0057

- Harness or connectors (The heated oxygen sensor 2 heater circuit is open or shorted.)
- Heated oxygen sensor 2 heater

P0058

- Harness or connectors (The heated oxygen sensor 2 heater circuit is shorted.)
- Heated oxygen sensor 2 heater

FAIL-SAFE Not applicable

P0037, P0038, P0057, P0058 HO2S2 HEATER

			0038, F	20057	, P005	8 HO2S2	2 HEATER	
< DTC/CIRCU							[VQ35DE]	
		PROCED	URE					Δ
1.PRECOND	ITIONING							A
ing the next te	st.			-		ted, always	perform the following before conduct-	EC
 Turn ignition switch OFF and wait at least 10 seconds. Turn ignition switch ON. 								
		OFF and wa	ait at leas	t 10 sec	conds.			
TESTING CO	-	following w	wa a a du w	a aanfi		bottom	Items is between 40 E V and 46 V at	С
idle.	ming the	ionowing p	rocedur	e, com	inn tha	. Dattery vo	Itage is between 10.5 V and 16 V at	
								D
-	O TO 2.							
2.PERFORM	DTC CON	IFIRMATIO	N PROC	EDURE				_
	ne and war	m it up to th	ne norma	l operat	ing tem	perature.		
	on switch (on switch (DFF and wa	it at leas	t 10 sec	conds.			
		OFF and wa	ait at leas	t 10 sec	onds.			F
			e speed l	betweer	n 3,500 a	and 4,000 rp	om for at least 1 minute under no load.	
 Let engine Check 1st 	e idle for 1 trip DTC.	minute.						G
<u>Is 1st tip DTC</u>	•							0
		<u>-C-211, "Dia</u>						
		Ifunction sy				eter to <u>GI-41</u>	, "Intermittent Incident".	H
				onon				
Diagnosis I	TUCEUUI	C					INFOID:000000011939750	
1.снеск но	02S2 POW	ER SUPPL	Y					
		xygen sens	or 2 (HO	2S2) ha	rness c	onnector.		I
U U	on switch (992 harn	000 000	nector a	and ground.		0
J. Check the	, voltage bi			633 6011		ina grouna.		
		+						K
DTC		HO2S2			Vo	oltage		
	Bank	Connector	Terminal	_				L
P0037, P0038	1	F62	1	Ground	Batter	y voltage		
P0057, P0058	2	F56	1	Ground	Datter	yvollage		
Is the inspection		ormal?						M
	O TO 3. O TO 2.							
2.снеск но				יס עום				Ν
					NCOI1			
	on switch (ct IPDM E/	Элг. R harness d	connecto	r.				0
					onnecto	r and IPDM	E/R harness connector.	0
				1				
DTC	D. I	HO2S2	. . .			M E/R	Continuity	Ρ
D0037 D0030	Bank 1	Connector F62		nai Co	onnector	Terminal 52		
P0037, P0038 P0057, P0058	2	F62	1		F50	52	Existed	

Is the inspection result normal?

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

F56

NO >> Repair or replace error-detected parts.

P0057, P0058

P0037, P0038, P0057, P0058 HO2S2 HEATER

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

$\overline{\mathbf{3}}$. 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	F62	2	F13	7	Existed
P0057, P0058	2	F56	2	115	47	LAISteu

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-212, "Component Inspection".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace malfunctioning heated oxygen sensor 2. Refer to <u>EM-32</u>, "Removal and Installation (bank 2)", <u>EM-34</u>, "Removal and Installation (bank 1)".

Component Inspection

INFOID:0000000011939751

1.CHECK HEATED OXYGEN SENSOR 2 HEATER

1. Turn ignition switch OFF.

2. Disconnect heated oxygen sensor 2 harness connector.

3. Check resistance between HO2S2 terminals as per the following.

+	-	
Heated oxy	gen sensor 2	Resistance
Terr	minal	
1	2	3.0 Ω [at 25°C (77°F)]
	1	
3	2	
	4	$\Omega \propto$
	1	(Continuity should not exist)
4	2	1
	3	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace malfunctioning heated oxygen sensor 2. Refer to <u>EM-36</u>, "<u>Removal and Installation</u> (bank 2)", <u>EM-37</u>, "<u>Removal and Installation (bank 1)</u>".

< DTC/CIRCUIT DIAGNOSIS >

P0075, P0081 IVT CONTROL SOLENOID VALVE

DTC Description

INFOID:0000000011939752

[VQ35DE]

DTC DETECTION LOGIC

- ECM detects an abnormal voltage in the intake valve timing control solenoid valve control circuit.
- ECM detects an abnormal voltage in the intake valve timing intermediate lock control solenoid valve control circuit.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
		Diagnosis condition	Start engine and let it idle	
P0075	INT/V TIM V/CIR-B1 (Intake valve control solenoid circuit bank 1)	Signal (terminal)	 Voltage signal transmitted from intake valve timing control solenoid valve to ECM Voltage signal transmitted from intake valve timing intermediate lock control sole- noid valve to ECM 	
		Threshold	 ECM detects an abnormal voltage in the i take valve timing control solenoid valve control circuit. ECM detects an abnormal voltage in the i take valve timing intermediate lock control solenoid valve control circuit. 	
		Diagnosis delay time	_	
		Diagnosis condition	Start engine and let it idle	
P0081	INT/V TIM V/CIR-B1 (Intake valve control solenoid circuit bank 2)	Signal (terminal)	 Voltage signal transmitted from intake valve timing control solenoid valve to ECM Voltage signal transmitted from intake valve timing intermediate lock control sole- noid valve to ECM 	
		Threshold	 ECM detects an abnormal voltage in the intake valve timing control solenoid valve control circuit. ECM detects an abnormal voltage in the intake valve timing intermediate lock control solenoid valve control circuit. 	
		Diagnosis delay time	_	

POSSIBLE CAUSE

P0075 · Harness or connectors Μ Intake valve timing control solenoid valve circuit is open or shorted. - Intake valve timing intermediate lock control solenoid valve circuit is open or shorted. Intake valve timing control solenoid valve Ν · Intake valve timing intermediate lock control solenoid valve P0081 Harness or connectors Ο - Intake valve timing control solenoid valve circuit is open or shorted. - Intake valve timing intermediate lock control solenoid valve circuit is open or shorted. Intake valve timing control solenoid valve Ρ Intake valve timing intermediate lock control solenoid valve

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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< DTC/CIRCUIT DIAGNOSIS >

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-214, "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:0000000011939753

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		+			Voltage	
	IVT co	ontrol solenoio	d valve	-		
	Bank	Connector	Terminal			
P0075	1	F67	1	Ground	Battery voltage	
P0081	2	F66	1	Giouna	Dattery Voltage	

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 IVT CONTROL SOLENOID VALVE POWER SUPPLY CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect IPDM E/R harness connector.
- Check the continuity between IVT control solenoid valve harness connector and IPDM E/R harness connector.

DTC	IVT co	ontrol solenoio	d valve	IPDM E/R		Continuity
	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0075	1	F67	1	F50	59	Existed
P0081	2	F66	1	1 50	59	Existed

4. Also check harness for short to ground.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

$\mathbf{3}.$ CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check the continuity between intake valve timing control solenoid valve harness connector and ECM harness connector.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

	IVT control solenoid valve				ECM		-
DTC	Bank	Connecto	Termina	I Connect	or Terminal	Continuity	
P0075	1	F67	2		117		_
P0081	2	F66	2	— F14	119	Existed	
. Also	check harn	ess for sho	rt to groun	d and shor	t to power.		
		ult normal?	-		·		
-	>> GO TO						
	•	•	•		nort to power	in harness or c	connectors.
.CHEC	K IVT CON	ITROL SOL	ENOID V	ALVE			
heck the	e IVT contr	ol solenoid	valve. Ref	er to <u>EC-2</u> 1	16, "Compone	ent Inspection (IVT Control Solenoid Valve)".
		ult normal?					
	>> GO TO		الممامهمام	volvo Dof	orto ENA EE "		
	•					Exploded View	—
						ALVE POWER	SUPPLY
	onnect IVT ignition sw		e lock con	trol solenoi	d valve harne	ess connector.	
			IVT intern	nediate loc	k control sole	noid valve harr	ness connector and ground.
	·	, ,					5
		+				_	
DTC	IVT interm	IVT intermediate lock control sole-		_	Voltage		
DIC		noid valve			voltage		
	Bank	Connector	Terminal				
P0075	1	F76	1	Ground	Battery voltage	9	
P0081	2	F77	1				
		ult normal?					
	>> GO TO >> GO TO						
-							SUPPLY CIRCUIT
				UNTRUL		ALVE POWER	
	ignition sw	itch OFF. M E/R harn	ess conne	ctor			
					lock control s	olenoid valve l	narness connector and IPDM
E/R ł	narness cor	nnector.					
						I	_
570	IVT intermediate lock control solenoid valve		d IF	DM E/R			
DTC	Bank	Connecto	Termina	I Connecto	or Terminal	Continuity	
P0075	1	F76	1				-
P0075	2	F70	1	F50	59	Existed	
			•	4			-
		ess for sho ult normal?	rt to groun	u.			
			diagnosis	for nower	supply circuit		
		or replace e			Suppry Circuit		
-	•	•		•		ALVE GROUNI	O CIRCUIT
	ignition sw						
		l harness c	onnector.				
				ermediate	lock control s	solenoid valve	harness connector and ECM

Check the continuity between IVT intermediate lock control solenoid valve harness connector and ECM harness connector.

< DTC/CIRCUIT DIAGNOSIS >

DTC	IVT interme	diate lock con valve	trol solenoid	ECM		Continuity	
	Bank	Connector	Terminal	Connector	Terminal		
P0075	1	F76	2	F14	118	Existed	
P0081	2	F77	2	1 14	120	LAIsted	

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

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace error-detected parts.

 $8. {\sf CHECK IVT INTERMEDIATE LOCK CONTROL SOLENOID VALVE}$

Check the IVT intermediate lock control solenoid valve. Refer to <u>EC-217</u>, "Component Inspection (IVT Intermediate Lock Control Solenoid Valve)".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace IVT intermediate lock control solenoid valve. Refer to EM-55, "Exploded View".

Component Inspection (IVT Control Solenoid Valve)

INFOID:000000011939754

1. CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE-I

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

	timing control id valve	Conditio	Resistance	
+	-			
Terr	ninal			
1	2			7.0 – 7.8 Ω
1		Temperature	20°C (68°F)	8
2	Ground			(Continuity should not exist)

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace intake valve timing control solenoid valve. Refer to EM-55, "Exploded View".

- 2. CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE-II
- 1. Remove intake valve timing control solenoid valve. Refer to EM-55, "Exploded View"
- Provide 12 V DC between intake valve timing control solenoid valve terminals 1 and 2, and then interrupt it. Make sure that the plunger moves as shown in the figure.
 CAUTION:
 Do not early 12 V DC continuously for 5 cocondo or more.

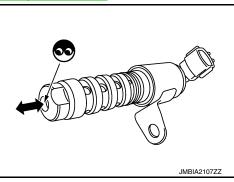
Do not apply 12 V DC continuously for 5 seconds or more. Doing so may result in damage to the coil in intake valve timing control solenoid valve. NOTE:

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace intake valve timing control solenoid valve. Refer to EM-55, "Exploded View".



P0075, P0081 IVT CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

Component Inspection (IVT Intermediate Lock Control Solenoid Valve)

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 follows.

diate lock co	timing interme- ontrol solenoid alve	Condition		Resistance	
+	-				
Terr	minal				
1	2			7.0 – 7.8 Ω	
1		Temperature	20°C (68°F)	8	
2	Ground			(Continuity should not exist)	

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace intake valve timing intermediate lock control solenoid valve. Refer to <u>EM-55</u>, "<u>Exploded</u> ⁽<u>View</u>".

2.CHECK INTAKE VALVE TIMING INTERMEDIATE LOCK CONTROL SOLENOID VALVE-II

- 1. Remove intake valve timing intermediate lock control solenoid valve. Refer to EM-55. "Exploded View"
- Provide 12 V DC between intake valve timing intermediate lock control solenoid valve terminals 1 and 2, and then interrupt it. Make sure that the plunger moves as shown in the figure.
 CAUTION:
 Do not apply 12 V DC continuously for 5 seconds or more.
 Doing so may result in damage to the coil in 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 intake valve timing intermediate lock control solenoid valve. Refer to <u>EM-55</u>, "<u>Exploded</u> <u>View</u>".

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[VQ35DE]

INFOID:000000011939755

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P0078, P0084 EVT CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

P0078, P0084 EVT CONTROL SOLENOID VALVE

DTC Description

INFOID:000000011939756

[VQ35DE]

DTC DETECTION LOGIC

An improper voltage is sent to the ECM through exhaust valve timing control solenoid valve.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
		Diagnosis condition	Start engine and let it idle	
	EX V/T ACT/CIRC-B1	Signal (terminal)	Voltage signal transmitted from exhaust valve timing control solenoid valve to ECM	
P0078	[Exhaust valve timing control solenoid valve (bank 1) circuit]	Threshold	An improper voltage is sent to the ECM through exhaust valve timing control solenoid valve	
		Diagnosis delay time	—	
		Diagnosis condition	Start engine and let it idle	
	EX V/T ACT/CIRC-B2	Signal (terminal)	Voltage signal transmitted from exhaust valve timing control solenoid valve to ECM	
P0084	[Exhaust valve timing control solenoid valve (bank 2) circuit]	Threshold	An improper voltage is sent to the ECM through exhaust valve timing control solenoid valve	
		Diagnosis delay time	-	

POSSIBLE CAUSE

P0078

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

P0084

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

FAIL-SAFE Not applicable

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-219, "Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-41, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

P0078, P0084 EVT CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

Diagnosis Procedure

INFOID:0000000011939757

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.

	(0		<u> </u>	С	
		+						
DTC	Exhaust valve	e timing control	solenoid valve	 Voltage 				
	Bank	Connector	Terminal				D	
P0078	1	F78	1	Ground	Battery volt-			
P0084	2	F79	1	Orbund	age		E	
Is the inspec	ction result n	ormal?						
	GO TO 2.						_	
	GO TO 4.						F	
			DID VALVE (DUTPUT SIC	SNAL CIRCU	JIT FOR OPEN AND SHORT		
	nition switch		. 1				G	
		rness conneo		timina con	rol solenoid	valve harness connector and E	-CM	
	connector.			, uning com				
							Н	
		+			_			
DTC	Exhaust valve	e timing control	solenoid valve	ECM		Continuity	1	
	Bank	Connector	Terminal	Connector	Terminal			
P0078	1	F78	2	F14	58	Existed		
P0084	2	F79	2	1 14	60	LAISted	J	
4. Also che	eck harness	for short to g	round and s	hort to powe	er.			
Is the inspec	ction result n	ormal?					К	
-	GO TO 3.						ľ	
^	• •	-	•	•		ess or connectors.		
3. CHECK	EXHAUST V	ALVE TIMIN	G CONTRO	L SOLENOI	D VALVE		L	
Check exha	ust valve tim	ing control se	olenoid valve	e.Refer to E	C-220, "Con	nponent Inspection".		
	<u>ction result n</u>							
	INSPECTIO						M	
	Replace ma View".	Ifunctioning	exhaust valv	e timing co	ntrol solenoi	d valve. Refer to <u>EM-55, "Explo</u>	<u>ided</u>	
4		ALVE TIMIN	G CONTRO	L SOLENOI	D VALVE PC	WER SUPPLY CIRCUIT - 2	Ν	
1. Turn igr	nition switch	OFF.						
2. Disconr	nect IPDM E/	R harness co					0	
			PDM E/R ha	irness conn	ector and ex	chaust valve timing control sole	noid ^O	
vaive ha	valve harness connector.							

		+		_		
DTC	IPDN	/I E/R	Exhaust valve soleno	Continuity		
	Connector	Terminal	Connector	Terminal		
P0075	F50	59	F78	1	Existed	
P0081	1.50	39	F79	1	Existed	

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P0078, P0084 EVT CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

4. 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.

Component Inspection

INFOID:0000000011939758

[VQ35DE]

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.

	timing control id valve	Condition		Resistance
+	-			
Terminal				
2	1			7.0 – 7.8 Ω
1	0 1	Temperature	20°C (68°F)	8 :: :
2	Ground			(Continuity should not exist)

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace malfunctioning exhaust valve timing control solenoid valve. Refer to <u>EM-55</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-55, "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-55</u>, "<u>Exploded</u> <u>View</u>".

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< DTC/CIRCUIT DIAGNOSIS >

P0101 MAF SENSOR

DTC Description

[VQ35DE]

INFOID:000000011939759

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DTC DETECTION LOGIC

1. A high voltage from the sensor is sent to ECM under light load driving condition.

2. A low voltage from the sensor is sent to ECM under heavy load driving condition.

DTC	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition			
			Diagnosis condition	-		
		1	Signal (terminal)	Voltage signal transmitted from MAF sensor to ECM		
		I	Threshold	A high voltage from the sensor is sent to ECM under light load driving condition		
P0101	MAF SEN/CIRCUIT-B1 (Mass or volume air flow "A" circuit		Diagnosis delay time	—		
FUIUI	range/performance)		Diagnosis condition	-		
			Signal (terminal)	Voltage signal transmitted from MAF sensor to ECM		
		2	Threshold	A low voltage from the sensor is sent to ECM under heavy load driving condition		
			Diagnosis delay time	—		

POSSIBLE CAUSE

- · Harness and connectors (The sensor circuit is open or shorted.)
- Intake air leaks
- MAF sensor
- EVAP control system pressure sensor
- Intake air temperature sensor

FAIL-SAFE

	Engine operating condition in fail-safe mode	k
Fail safe mode	Vehicle behavior	N
Mass air flow sensor circuit	Engine speed will not rise more than 2,400 rpm due to the fuel cut.	
		 L

1.CHECK DTC PRIORITY

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

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to EC-107, "DTC Index".
- 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 warm it up to normal operating temperature.

2. Drive the vehicle for at least 5 seconds under the following conditions: CAUTION:

Always drive vehicle at safe speed.

Selector lever	Suitable position
Vehicle speed	40 km/h (25 MPH) or more

NOTE:

- · The gear must be fixed while driving the vehicle.
- Keep the accelerator pedal as steady as possible during cruising.
- 3. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to EC-222, "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:000000011939760

1.CHECK DTC PRIORITY

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

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to <u>EC-107, "DTC Index"</u>.

NO >> GO TO 2.

2. CHECK INTAKE SYSTEM

Check the following for connection.

Air duct

Vacuum hoses

• Intake air passage between air duct and intake manifold

Is the inspection result normal?

YES >> GO TO 3.

NO >> Reconnect the parts.

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

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

	+			
MAF	sensor	_	Voltage	
Connector	Terminal			
F31	1	Ground	Approx. 5 V	

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4.CHECK MASS AIR FLOW (MAF) SENSOR POWER SUPPLY 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	E	Continuity	
Connector	Terminal	Connector	Terminal	Continuity
F31	1	F13	28	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

oneok inc		ess connector. etween MAF se	ensor harness	s connector a	nd ECM harness connector.
MAF se	ensor	EC	CM	Continuity	-
Connector	Terminal	Connector	Terminal	Continuity	_
F31	2	F13	40	Existed	_
Also check the inspectic		short to groun	id and short to	o power.	
	D TO 6.	<u>na:</u>			
			-	nort to power	in harness or connectors.
CHECK MA	F SENSOR	INPUT SIGNA	L CIRCUIT		
Check the	continuity be	etween MAF se	ensor harness	s connector a	nd ECM harness connector.
MAF se	ensor	EC	<u>M</u>		_
Connector	Terminal	Connector	Terminal	Continuity	
F31	3	F13	38	Existed	-
Also check	harness for	short to groun	d and short to	o power.	-
	on result norn	-		•	
	D TO 7.				
					la bana an an anna ataus
			-	nort to power	in harness or connectors.
CHECK INT	AKE AIR TE	MPERATURE	SENSOR		
CHECK INT	AKE AIR TE	MPERATURE	SENSOR		
CHECK INT	AKE AIR TE	MPERATURE	SENSOR		
CHECK INT neck intake a the inspectic 'ES >> GO	AKE AIR TE ir temperatur on result norm O TO 8.	MPERATURE	SENSOR er to <u>EC-223,</u>	"Component	Inspection".
CHECK INT neck intake a the inspectio (ES >> GO IO >> Re	AKE AIR TE ir temperatur on result norm O TO 8. eplace MAF s	MPERATURE re sensor. Refe nal?	SENSOR er to <u>EC-223,</u> take air tempe	"Component	Inspection".
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CHECK INT neck intake a the inspectio (ES >> GC (O >> Re CHECK EVAP c the inspectio (ES >> GC (O >> Re CHECK MAF neck MAF se the inspectio	AKE AIR TE ir temperatur on result norm O TO 8. eplace MAF s AP CONTRO ontrol system on result norm O TO 9. eplace EVAP F SENSOR nsor. Refer t on result norm	MPERATURE re sensor. Refe anal? sensor (with inf DL SYSTEM Pl n pressure ser nal? control systen o <u>EC-223, "Co</u> nal?	SENSOR er to <u>EC-223,</u> take air tempe RESSURE SI nsor. Refer to	"Component erature senso ENSOR EC-365, "Co nsor.	Inspection". or).
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CHECK INT neck intake a the inspectio (ES >> GO NO >> Re CHECK EVAP c the inspectio (ES >> GO NO >> Re CHECK MA neck MAF se the inspectio (ES >> IN: NO >> Re Omponent CHECK MA	AKE AIR TE ir temperatur on result norm O TO 8. Place MAF s AP CONTRO ontrol system on result norm O TO 9. Place EVAP F SENSOR nsor. Refer to n result norm SPECTION F Place MAF s Inspectio	MPERATURE re sensor. Refe nal? sensor (with inf DL SYSTEM Pl n pressure ser nal? control system o <u>EC-223, "Co</u> nal? END sensor. Refer to	SENSOR er to EC-223, take air tempe RESSURE SI nsor. Refer to n pressure se <u>omponent Insp</u> o <u>EM-26, "Re</u>	"Component erature senso ENSOR EC-365, "Co nsor.	Inspection". or). mponent Inspection". stallation".
CHECK INT neck intake a the inspectio (ES >> GO (NO >> Re CHECK EVAP c the inspectio (ES >> GO (NO >> Re CHECK MA neck MAF se the inspectio (ES >> IN NO >> Re omponent CHECK MA	AKE AIR TE ir temperatur on result norm O TO 8. Place MAF s AP CONTRO ontrol system on result norm O TO 9. Place EVAP F SENSOR nsor. Refer to n result norm SPECTION F Place MAF s Inspectio	MPERATURE re sensor. Refe nal? sensor (with inf DL SYSTEM Pl n pressure sen nal? control system o <u>EC-223, "Co</u> nal? END sensor. Refer to n W (MAF) SEN	SENSOR er to EC-223, take air tempe RESSURE SI nsor. Refer to n pressure se <u>omponent Insp</u> o <u>EM-26, "Re</u>	"Component erature senso ENSOR EC-365, "Co nsor.	Inspection". or). mponent Inspection". stallation".

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

< DTC/CIRCUIT DIAGNOSIS >

Monitor item	Condition	Indication
	Ignition switch ON (Engine stopped.)	Approx. 3,720 Hz
MASS AIR FLOW SENSOR (Hz)	Idle (Engine is warmed-up to normal operating temperature.)	3,900 – 4,500 Hz
	Idle to about 4,000 rpm	3,900 – 4,500 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	
Connector	Terr	ninal			
F13			Ignition switch ON (Engine stopped.)	Approx. 3,720 Hz	
	38	40	Idle (Engine is warmed-up to normal operating temperature.)3,900 - 4,500 Hz		
			Idle to about 4,000 rpm	3,900 – 4,500 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.

3. CHECK MAF SENSOR-II

(D) 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
	Ignition switch ON (Engine stopped.)	Approx. 3,720 Hz
MASS AIR FLOW SENSOR (Hz)	Idle (Engine is warmed-up to normal operating temperature.)	3,900 – 4,500 Hz
	Idle to about 4,000 rpm	3,900 – 4,500 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.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

	ECM			
Connector	+	-	Condition	Frequency
	Term	nai		A
			Ignition switch ON (Engine stopped.)	Approx. 3,720 Hz
F13	38	40	Idle (Engine is warmed-up to normal operating temperature.)	3,900 – 4,500 Hz
			Idle to about 4,000 rpm	3,900 – 4,500 to Approx. 8,000 Hz*
YES >> I NO >> (CHECK M With CON Turn igni Disconne Start eng Connect	tion switch OF ect MAF senso jine and warm CONSULT an	END III F. or harness of it up to nor d select "D.	connector and reconnect it again. mal operating temperature. ATA MONITOR" mode. 0R (Hz)" and check the indication.	
Moni	itor item		Condition	Indication
		-	itch ON (Engine stopped.)	Approx. 3,720 Hz
MASS AIR FLOW SENSOR (Hz) Idle (Engine) Idle (Engin	e is warmed-up to normal operating temperature.)	3,900 – 4,500 Hz
	Idle to abo			
	r linear frequency		ut 4,000 rpm nse to engine being increased to about 4,000 rpm	3,900 – 4,500 to Approx. 8,000 Hz
*: Check fo Without Co I. Turn igni 2. Disconne 3. Start eng	ONSULT tion switch OF ect MAF senso ine and warm ine frequency b	F. or harness of it up to nor		
*: Check fo Without Co I. Turn igni 2. Disconne 3. Start eng	ONSULT tion switch OF ect MAF senso jine and warm ie frequency b ECM	F. or harness of it up to nor	nse to engine being increased to about 4,000 rpm connector and reconnect it again. mal operating temperature. M harness connector terminals under the	e following conditions.
*: Check fo Without Co I. Turn igni 2. Disconne 3. Start eng	ONSULT tion switch OF ect MAF sense ine and warm ine frequency b ECM +	rise in respon F. or harness of it up to nor etween EC	nse to engine being increased to about 4,000 rpm connector and reconnect it again. mal operating temperature.	
*: Check for Without CO . Turn igni 2. Disconne 3. Start eng 4. Check th	ONSULT tion switch OF ect MAF senso jine and warm ie frequency b ECM	rise in respon F. or harness of it up to nor etween EC	nse to engine being increased to about 4,000 rpm connector and reconnect it again. mal operating temperature. M harness connector terminals under the Condition	e following conditions. Frequency
*: Check for Without CO . Turn igni 2. Disconne 3. Start eng 4. Check th	ONSULT tion switch OF ect MAF sense ine and warm ine frequency b ECM +	rise in respon F. or harness of it up to nor etween EC	nse to engine being increased to about 4,000 rpm connector and reconnect it again. mal operating temperature. M harness connector terminals under the Condition Ignition switch ON (Engine stopped.) Idle (Engine is warmed-up to normal operating	e following conditions.
*: Check for Without CO Turn igni Disconne Start eng Check th	ONSULT tion switch OF ect MAF senso jine and warm ie frequency b ECM + Term	rise in respon F. or harness of it up to nor etween EC	nse to engine being increased to about 4,000 rpm connector and reconnect it again. mal operating temperature. M harness connector terminals under the Condition	e following conditions. Frequency Approx. 3,720 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 EM-26, "Removal and Installation".

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DTC Description

[VQ35DE]

INFOID:000000011939762

DTC DETECTION LOGIC

- · An excessively low voltage from the sensor is sent to ECM.
- An excessively high voltage from the sensor is sent to ECM.

DTC	CONSULT screen terms (Trouble diagnosis content)	DT	C detection condition
		Diagnosis condition	Start engine and let it idle
50400	MAF SEN/CIRCUIT-B1	Signal (terminal)	Voltage signal transmitted from mass air flow sensor to ECM
P0102		Threshold	An excessively low voltage from the sensor is sent to ECM
		Diagnosis delay time	—
		Diagnosis condition	 Ignition switch ON Start engine and let it idle
P0103	MAF SEN/CIRCUIT-B1 (Mass or volume air flow "A" circuit high input)	Signal (terminal)	Voltage signal transmitted from mass air flow sensor to ECM
		Threshold	An excessively high voltage from the sensor is sent to ECM
		Diagnosis delay time	-

POSSIBLE CAUSE

P0102

- · Harness or connectors (The sensor circuit is open or shorted.)
- Intake air leakage
- Mass air flow sensor

P0103

- Harness or connectors (The sensor circuit is open or shorted.)
- Mass air flow sensor

FAIL-SAFE

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

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0102 or P0103 is displayed with another DTC P0643, first perform the trouble diagnosis for DTC P0643.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to <u>EC-424, "DTC Description"</u>.

NO >> GO TO 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.

Which DTC is detected?

P0102 >> GO TO 3.

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EC-226

P0102, P0103 MAF SENSOR	
< DTC/CIRCUIT DIAGNOSIS > [VQ35DE]	
P0103 >> GO TO 4.	
3. PERFORM DTC CONFIRMATION PROCEDURE FOR DTC P0102	А
 Start engine and wait at least 5 seconds. Check DTC. 	EC
Is DTC detected?	EC
YES >> Proceed to <u>EC-227, "Diagnosis Procedure"</u> . NO >> INSPECTION END	С
4.PERFORM DTC CONFIRMATION PROCEDURE FOR DTC P0103-I	0
 Turn ignition switch ON and wait at least 5 seconds. Check DTC. 	D
Is DTC detected?	
YES >> Proceed to <u>EC-227, "Diagnosis Procedure"</u> . NO >> GO TO 5.	Ε
5.PERFORM DTC CONFIRMATION PROCEDURE FOR DTC P0103-II	
1. Start engine and wait at least 5 seconds.	F
2. Check DTC.	
<u>Is DTC detected?</u> YES >> Proceed to <u>EC-227, "Diagnosis Procedure"</u> . NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-41, "Intermittent Incident"</u> . NO-2 >> Confirmation after repair: INSPECTION END	G
Diagnosis Procedure	Н
1.CHECK DTC PRIORITY	
If DTC P0102 or P0103 is displayed with another DTC P0643, first perform the trouble diagnosis for DTC P0643.	
Is applicable DTC detected?	
 YES >> Perform diagnosis of applicable. Refer to <u>EC-424, "DTC Description"</u>. NO >> GO TO 2. 	J
2.INSPECTION START	
Confirm the detected DTC.	K
Which DTC is detected?	
P0102 >> GO TO 3. P0103 >> GO TO 4.	L
3. CHECK INTAKE SYSTEM	
Check the following for connection.	M
Air duct	
Vacuum hoses Inteles air passage between air duet te inteles menifeld	NI
 Intake air passage between air duct to intake manifold <u>Is the inspection result normal?</u> 	Ν
YES >> GO TO 4.	
NO >> Reconnect the parts.	0
4.CHECK MAF SENSOR POWER SUPPLY	
1. Disconnect mass air flow (MAF) sensor harness connector.	Р
 Turn ignition switch ON. Check the voltage between MAF sensor harness connector and ground. 	

< DTC/CIRCUIT DIAGNOSIS >

	+			
MAF	sensor	_	Voltage	
Connector Terminal				
F31	1	Ground	Approx. 5 V	

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 5.

5.CHECK MASS AIR FLOW (MAF) SENSOR POWER SUPPLY 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	E	СМ	Continuity
Connector	Terminal	Connector	Terminal	Continuity
F31	1	F13	28	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

6.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	E	CM	Continuity
	Connector	Terminal	Connector	Terminal	Continuity
_	F31	2	F13	40	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 MAF SENSOR INPUT SIGNAL CIRCUIT

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

-	MAF	sensor	E	CM	Continuity
	Connector	Terminal	Connector	Terminal	Continuity
-	F31	3	F13	38	Existed

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.

 ${f 8}$.CHECK MASS AIR FLOW SENSOR

Check mass air flow sensor. Refer to EC-229. "Component Inspection".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace mass air flow sensor. Refer to <u>EM-26</u>, "Removal and Installation".

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

Terminal

Is the inspection result normal?

< DTC/CIRCUIT DIAGNOSIS > **Component Inspection**

Turn ignition switch OFF.

Monitor item

MASS AIR FLOW SENSOR (Hz)

Turn ignition switch OFF.

ECM

+

38

Without CONSULT

Connector

F13

(P)With CONSULT

1. 2.

3.

4. 5.

1.

2.

3.

4

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

Reconnect all harness connectors disconnected.

Reconnect all harness connectors disconnected.

Start engine and warm it up to normal operating temperature.

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Start engine and warm it up to normal operating temperature. Connect CONSULT and select "DATA MONITOR" mode.

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

Idle to about 4,000 rpm

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

Ignition switch ON (Engine stopped.)

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.

temperature.)

Idle to about 4,000 rpm

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

Is the inspection result normal?

YFS >> GO TO 4. NO >> GO TO 3.

3.CHECK MAF SENSOR-II

(P)With CONSULT

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

Condition

Idle (Engine is warmed-up to normal operating temperature.)

Check the frequency between ECM harness connector terminals under the following conditions.

Condition

Idle (Engine is warmed-up to normal operating

Ignition switch ON (Engine stopped.)

Revision: October 2015

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INFOID:000000011939764

Indication

Approx. 3,720 Hz

3,900 - 4,500 Hz

3,900 - 4,500 to Approx. 8,000 Hz*

Frequency

Approx. 3,720 Hz

3,900 - 4,500 Hz

3,900 - 4,500 to Approx. 8,000 Hz*

< DTC/CIRCUIT DIAGNOSIS >

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.)	3,900 – 4,500 Hz
	Idle to about 4,000 rpm	3,900 – 4,500 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	+ – Terminal		Condition	Frequency (Hz)	
Connector					
	38 40		Ignition switch ON (Engine stopped.)	Approx. 3,720 Hz	
F13		40	Idle (Engine is warmed-up to normal operating temperature.)	3,900 – 4,500 Hz	
			Idle to about 4,000 rpm	3,900 – 4,500 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.

4.CHECK MAF SENSOR-III

(I) 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.)	3,900 – 4,500 Hz
	Idle to about 4,000 rpm	3,900 – 4,500 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.

ECM					
Connector	+	_	Condition	Frequency (Hz)	
Connector	Terminal				
	38	38 40	Ignition switch ON (Engine stopped.)	Approx. 3,720 Hz	
F13			Idle (Engine is warmed-up to normal operating temperature.)	3,900 – 4,500 Hz	
			Idle to about 4,000 rpm	3,900 – 4,500 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?



< DTC/	CIRCUIT DIAGNOSIS >	[VQ35DE]
YES	>> INSPECTION END	
NO	>> Clean or replace MAF sensor. Refer to EM-26, "Removal and Installation".	

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P0111 IAT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P0111 IAT SENSOR

DTC Description

INFOID:000000011939765

[VQ35DE]

DTC DETECTION LOGIC

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.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
		Diagnosis condition	—
		Signal (terminal)	Voltage signal transmitted from IAT sensor to ECM
P0111	IAT SENSOR 1 B1 (Intake air temperature sensor 1 circuit range/performance bank 1)	Threshold	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
		Diagnosis delay time	—

POSSIBLE CAUSE

• Harness and connectors (High or low resistance in the IAT sensor circuit)

IAT sensor

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.INSPECTION START

Is it necessary to erase permanent DTC?

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

 $2. {\sf CHECK} \text{ intake air temperature (iat) sensor}$

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)	
2 and 4	Temperature [°C (°F)]	25 (77)	1,800 – 2,200

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to EC-233, "Diagnosis Procedure".

3. 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.

EC-232

P0111 IAT SENSOR

< DTC/CIRCUIT DIAGNOSIS >	[VQ35DE]	
Before performing the following procedure, confirm that battery voltage is 11 V or mor	e at idle.	
		А
>> GO TO 4.	_	
4.PERFORM DTC CONFIRMATION PROCEDURE		EC
1. Move the vehicle to a cool place. NOTE:		
 Cool the vehicle in an environment of ambient air temperature between -10°C (14°F) and Turn ignition switch OFF and leave the vehicle for 12 hours. CAUTION: 	35°C (95°F).	С
Never turn ignition switch ON during this procedure.		
NOTE: The vehicle must be cooled with the hood open.		D
3. Start engine and let it idle for 5 minutes or more.		
CAUTION:		Е
Never turn ignition switch OFF during idling.4. Check 1st trip DTC.		
Is 1st trip DTC detected?		_
YES >> Proceed to EC-233, "Diagnosis Procedure".		F
 NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-41, "Intermittent Incident</u> NO-2 >> Confirmation after repair: INSPECTION END 		G
Diagnosis Procedure	INFOID:000000011939766	G
1. CHECK INTAKE AIR TEMPERATURE (IAT) SENSOR		Н
Check intake air temperature sensor. Refer to EC-233, "Component Inspection".		
Is the inspection result normal?		
YES >> INSPECTION END NO >> Replace mass air flow sensor. Refer to <u>EM-26, "Removal and Installation"</u> .		
•		
Component Inspection	INFOID:000000011939767	J
1. CHECK INTAKE AIR TEMPERATURE SENSOR		
1. Turn ignition switch OFF.		Κ
 Disconnect mass air flow sensor harness connector and reconnect it again. Turn ignition switch ON. 		
4. Select "DATA MONITOR" mode with CONSULT.		
5. Check that the indicated value of "INT/A TEMP SEN" is almost the same as intake air tem	perature.	L
Is the inspection result normal?		
YES >> INSPECTION END NO >> Replace mass air flow sensor (with intake air temperature sensor). Refer to <u>EM-26</u> <u>Installation</u> "	, "Removal and	M
		NI
		Ν
		0

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P0112, P0113 IAT SENSOR

DTC Description

[VQ35DE]

INFOID:000000011939768

DTC DETECTION LOGIC

- · An excessively low voltage from the sensor is sent to ECM.
- · An excessively high voltage from the sensor is sent to ECM.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
		Diagnosis condition	Ignition switch ON	
D0112	IAT SEN/CIRCUIT-B1	Signal (terminal)	Voltage signal transmitted from intake air temperature sensor to ECM	
P0112	(Intake air temperature sensor 1 circuit low bank 1)	Threshold	An excessively low voltage from the sensor is sent to ECM	
		Diagnosis delay time	—	
		Diagnosis condition	Ignition switch ON	
D0112	IAT SEN/CIRCUIT-B1	Signal (terminal)	Voltage signal transmitted from intake air temperature sensor to ECM	
P0113	(Intake air temperature sensor 1 circuit high bank 1)	Threshold	An excessively high voltage from the sensor is sent to ECM	
		Diagnosis delay time	—	

POSSIBLE CAUSE

P0112

- Harness and connectors (The sensor circuit is open or shorted.)
- Intake air temperature sensor

P0113

- · Harness and connectors (The sensor circuit is open or shorted.)
- Intake air temperature sensor

FAIL-SAFE

Not applicable

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 5 seconds.
- 2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to EC-234, "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

1. CHECK INTAKE AIR TEMPERATURE SENSOR POWER SUPPLY

INFOID:0000000011939769

P0112, P0113 IAT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

- 1. Disconnect mass air flow sensor (with intake air temperature sensor) harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between mass air flow sensor harness connector and ground.

+ MAF sensor			– Voltage		
Connector	Terminal				
F31	4	Ground	Approx	Approx. 5 V	
YES >> GO NO >> Re CHECK INT Turn ignitic Disconnec	AKE AIR TEMP on switch OFF. t ECM harness	it, short to grou PERATURE SE connector.	NSOR GROUI	ower in harness or conn ND CIRCUIT FOR OPEN ess connector and ECM	AND SHORT
MAF	sensor	E	СМ		
Connector	Terminal	Connector	Terminal	Continuity	
F31	2	F13	40	Existed	
	D TO 3. Epair open circu	it. short to arou	nd or short to r	ower in harness or conn	ectors.
NO >> Re CHECK INT heck intake a the inspection YES >> IN	pair open circu AKE AIR TEMF ir temperature s on result normal SPECTION EN	PERATURE SE sensor. Refer to ? D	NSOR 9 <u>EC-235, "Cor</u>	ower in harness or conn ponent Inspection". Removal and Installation	
NO >> Re CHECK INT heck intake a the inspection YES >> IN NO >> Re	pair open circu AKE AIR TEMF ir temperature s on result normal SPECTION EN	PERATURE SE sensor. Refer to ? D	NSOR 9 <u>EC-235, "Cor</u>	nponent Inspection".	
NO >> Re CHECK INT heck intake a the inspection YES >> IN NO >> Re Component	pair open circu AKE AIR TEMF ir temperature son result normal SPECTION EN splace mass air	PERATURE SE sensor. Refer to ? D flow sensor. Re	NSOR <u>EC-235, "Cor</u> efer to <u>EM-26,</u>	nponent Inspection".	<u></u> .

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[VQ35DE]

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P0116 ECT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P0116 ECT SENSOR

DTC Description

INFOID:0000000011939771

[VQ35DE]

DTC DETECTION LOGIC

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.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
		Diagnosis condition	-
		Signal (terminal)	Voltage signal transmitted from ECT sensor to ECM
P0116	ECT SEN/CIRC (Engine coolant temperature sensor 1 circuit range/performance)	Threshold	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
		Diagnosis delay time	—

POSSIBLE CAUSE

- Harness and connectors (High or low resistance in the ECT sensor circuit)
- ECT sensor

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.INSPECTION START

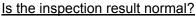
Is it necessary to erase permanent DTC?

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

 $2. {\sf CHECK} \ {\sf ENGINE} \ {\sf COOLANT} \ {\sf TEMPERATURE} \ ({\sf ECT}) \ {\sf SENSOR}$

- 1. Turn ignition switch OFF.
- 2. Disconnect ECT sensor harness connector.
- 3. Remove ECT sensor. Refer to CO-25, "Removal and Installation".
- 4. Check resistance between ECT sensor terminals by heating with hot water as shown in the figure.

Terminals	Condition		Resistance (k Ω)
		20 (68)	2.37 – 2.63
1 and 2	Temperature [°C (°F)]	50 (122)	0.68 – 1.00
		90 (194)	0.236 – 0.260



YES >> INSPECTION END

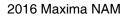
NO >> Proceed to <u>EC-237, "Diagnosis Procedure"</u>.

3. 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.

EC-236



P0116 ECT SENSOR

< DTC/CIRCUIT DI	AGNOSIS >			[VQ35DE]	
	itch OFF and wait	at least 10 se	conds.		
TESTING CONDITIBefore performing		rocedure. do	not add fuel.		А
Before performin	g the following p	rocedure, ch	eck that fuel lev	el is between 1/4 and 4/4.	
Before performin	ig the following p	rocedure, co	nfirm that batter	ry voltage is 11 V or more at idle.	EC
>> GO TO	4.				
4.PERFORM DTC		PROCEDURE	Ξ		С
	e to a cool place.				
NOTE:	in an environmen	t of ambient a	ir temperature be	etween –10°C (14°F) and 35°C (95°F).	D
2. Turn ignition sw	itch OFF and leav				
CAUTION: Never turn ign	ition switch ON d	uring this pro	ocedure		
NOTE:					E
	st be cooled with t d let it idle for 20 m				
CAUTION:					F
4. Check 1st trip E	ition switch OFF	during idling.			
Is 1st trip DTC deter					G
YES >> Proceed	d to <u>EC-237, "Diag</u>	nosis Procedu	<u>ure"</u> .		
NO-1 >> To chec NO-2 >> Confirm				I-41, "Intermittent Incident".	
	·				Н
Diagnosis Proce	euure			INFOID:000000011939772	
1.CHECK ENGINE	COOLANT TEMP	PERATURE (E	CT) SENSOR		
Check ECT sensor.	Refer to EC-237.	Component Ir	nspection".		
Is the inspection res					J
	CTION END e ECT sensor. Ref	er to CO-25. "	Exploded View".		
Component Ins				INFOID:000000011939773	K
				INFOLD.000000011939773	
1.CHECK ENGINE	COOLANT TEMP	PERATURE SI	ENSOR		
 Turn ignition sw Disconnect eng 		ratura concor l	harnaaa aannaat	or.	L
	ine coolant temper coolant temperati			emoval and Installation".	
4. Check resistant terminals as per	ce between engin	e coolant tem	perature sensor	0	\mathbb{N}
terminais as per	r the following.				
ECT sensor					N
+ –	Condition	on	Resistance (kΩ)		
Terminal			()		~
		20 (68)	2.37 - 2.63		С
1 2	Temperature [°C (°F)]	50 (122)	0.68 - 1.00		
		90 (194)	0.236 - 0.260	JMBIA0080ZZ	Ρ

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace engine coolant temperature sensor. Refer to <u>CO-25, "Removal and Installation"</u>.

< DTC/CIRCUIT DIAGNOSIS >

P0117, P0118 ECT SENSOR

DTC Description

[VQ35DE]

INFOID:000000011939774

DTC DETECTION LOGIC

- An excessively low voltage from the sensor is sent to ECM.
- An excessively high voltage from the sensor is sent to ECM.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
		Diagnosis condition	Ignition switch ON	
P0117	ECT SEN/CIRC	Signal (terminal)	Voltage signal transmitted from engine cool- ant temperature sensor to ECM	
P0117	(Engine coolant temperature sensor 1 circuit low)	Threshold	An excessively low voltage from the sensor is sent to ECM	
		Diagnosis delay time	—	
		Diagnosis condition	Ignition switch ON	
D0110	ECT SEN/CIRC	Signal (terminal)	Voltage signal transmitted from engine cool- ant temperature sensor to ECM	
P0118	(Engine coolant temperature sensor 1 circuit high)	Threshold	An excessively high voltage from the sensor is sent to ECM	
		Diagnosis delay time	-	

POSSIBLE CAUSE

P0117

- Harness or connectors (The sensor circuit is open or shorted.)
- · Engine coolant temperature sensor

P0118

- · Harness or connectors (The sensor circuit is open or shorted.)
- · Engine coolant temperature sensor

FAIL-SAFE

Engine ope	rating condition in fail-safe mode			
Fail safe mode	Vehicle be	ehavior		
	Engine coolant temperature will be determined by ECM based on the following condition. CONSULT displays the engine coolant temperature decided by ECM.			
	Condition	Engine coolant temperature decided (CONSULT display)		
Engine coolant temperature	Just as ignition switch is turned ON or START	40°C (104°F)		
sensor circuit	Approx 4 minutes or more after engine starting	80°C (176°F)		
	Except as shown above	40 - 80°C (104 - 176°F) (Depends on the time)		
	When the fail-safe system for engine coolant temperates while engine is running.	prature sensor is activated, the cooling fan op		

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.

P0117, P0118 ECT SENSOR

< DTC/CIRCU					
	IT DIAGNO	SIS >			[VQ35DE]
>> G(D TO 2.				
2.PERFORM	DTC CONF	IRMATION P	ROCEDUF	٩E	
1. Turn ignitic	on switch ON	and wait at	least 5 sec	conds.	
2. Check DT(С.				
Is DTC detecte					
		-239, "Diagn			GI-41, "Intermittent Incident".
NO-2 >> Co					ST 41, Internition incluent.
Diagnosis P	rocedure				INFCID:000000011939775
4					
1. CHECK EC	T SENSOR	POWER SU	PPLY		
			ture (ECT)	sensor harness	connector.
	on switch ON voltage betv		nsor harne	ess connector and	around.
	0				5
	+				
EC.	T sensor		_	Voltage	
Connector	Termir	-			
F11	1		Ground	Approx. 5 V	
Is the inspectio		<u>nal?</u>			
	D TO 2.				
^				short to power in	harness or connectors.
2. CHECK EC ⁻	T SENSOR	GROUND C	RCUIT		
	on switch OF				
		ess connecto		noon connoctor c	and COM horness connector
3. Check the	continuity be	etween ECT	sensor nar	ness connector a	and ECM harness connector.
ECT se	nsor		ECM		
Connector	Terminal	Connector			-
				Continuity	-
F11	2		Termina	al	-
F11 4 Also check	2 charness for	F13	Termina 35	al Existed	-
4. Also check	harness for	F13 r short to grou	Termina 35	al	-
4. Also check Is the inspectio	harness for	F13 r short to grou	Termina 35	al Existed	- - -
4. Also check Is the inspectio YES >> GC	harness for <u>on result norr</u> O TO 3.	F13 r short to grou mal?	Termina 35 und and sh	al Existed	- - - harness or connectors.
4. Also check <u>Is the inspectio</u> YES >> GC NO >> Re	harness for <u>on result norr</u> O TO 3. epair open ci	F13 r short to grou mal? rcuit, short to	Termina 35 und and sh	Existed Fort to power.	- - harness or connectors.
4. Also check <u>Is the inspectio</u> YES >> GC NO >> Re 3. CHECK ENG	t harness for o <u>n result norr</u> O TO 3. pair open ci GINE COOL	F13 r short to grou mal? rcuit, short to ANT TEMPE	Termina 35 und and sh o ground or ERATURE S	el Existed Nort to power. Short to power in SENSOR	harness or connectors.
4. Also check <u>Is the inspectio</u> YES >> GC NO >> Re 3. CHECK ENG	c harness for o <u>n result norr</u> O TO 3. epair open ci GINE COOL coolant temp	F13 short to grou mal? rcuit, short to ANT TEMPE	Termina 35 und and sh o ground or ERATURE S	el Existed Nort to power. Short to power in SENSOR	
4. Also check <u>Is the inspectio</u> YES >> GC NO >> Re 3. CHECK ENG Check engine of Is the inspectio	c harness for o <u>n result norr</u> O TO 3. epair open ci GINE COOL coolant temp	F13 r short to grou mal? rcuit, short to ANT TEMPE perature sens mal?	Termina 35 und and sh o ground or ERATURE S	el Existed Nort to power. Short to power in SENSOR	
4. Also check Is the inspectio YES >> GC NO >> Re 3. CHECK ENC Check engine of Is the inspection YES >> INS	c harness for on result norr O TO 3. epair open ci GINE COOL coolant temp on result norr SPECTION	F13 r short to grou mal? rcuit, short to ANT TEMPE perature sens mal? END	Termina 35 und and sh o ground or ERATURE S	al Existed Nort to power. Short to power in SENSOR o <u>EC-239, "Comp</u>	
4. Also check Is the inspectio YES >> GC NO >> Re 3. CHECK ENC Check engine of Is the inspectio YES >> INS	c harness for on result norr O TO 3. epair open ci GINE COOL coolant temp on result norr SPECTION eplace engin	F13 r short to grou mal? rcuit, short to ANT TEMPE perature sens mal? END e coolant ten	Termina 35 und and sh o ground or ERATURE S	al Existed Nort to power. Short to power in SENSOR o <u>EC-239, "Comp</u>	ponent Inspection".
4. Also check Is the inspectio YES >> GC NO >> Re 3. CHECK ENG Check engine of Is the inspectio YES >> INS NO >> Re Component	c harness for on result norr O TO 3. epair open ci GINE COOL coolant temp on result norr SPECTION eplace engine Inspectio	F13 r short to grou mal? rcuit, short to ANT TEMPE perature sens mal? END e coolant ten	Termina 35 und and sh o ground or ERATURE S sor. Refer to nperature s	al Existed Fort to power. Short to power in SENSOR O EC-239, "Comp sensor. Refer to <u>C</u>	oonent Inspection". CO-25, "Exploded View".
4. Also check Is the inspectio YES >> GC NO >> Re 3. CHECK ENC Check engine of Is the inspectio YES >> INS NO >> Re Component 1. CHECK ENC	c harness for on result norr O TO 3. epair open ci GINE COOL coolant temp on result norr SPECTION eplace engin Inspectio GINE COOL	F13 r short to grou mal? rcuit, short to ANT TEMPE perature sens mal? END e coolant ten D ANT TEMPE	Termina 35 und and sh o ground or ERATURE S sor. Refer to nperature s	al Existed Fort to power. Short to power in SENSOR O EC-239, "Comp sensor. Refer to <u>C</u>	oonent Inspection". CO-25, "Exploded View".
4. Also check Is the inspectio YES >> GC NO >> Re 3. CHECK ENC Check engine co Is the inspectio YES >> INS NO >> Re Component 1. CHECK ENC 1. Turn ignitic	c harness for on result norr O TO 3. epair open ci GINE COOL coolant temp on result norr SPECTION eplace engin Inspectic GINE COOL on switch OF	F13 r short to grou mal? rcuit, short to ANT TEMPE perature sens mal? END e coolant ten DN ANT TEMPE	Termina 35 und and sh o ground or ERATURE S FRATURE S	al Existed Fort to power. Short to power in SENSOR O EC-239, "Comp sensor. Refer to <u>C</u>	oonent Inspection". CO-25, "Exploded View".

3. Remove engine coolant temperature sensor. Refer to CO-25, "Removal and Installation".

P0117, P0118 ECT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

Check resistance between engine coolant temperature sensor 4. terminals as per the following.

ECT s	sensor				
+	_	Conditior	Condition		
Tern	ninal	_		(kΩ)	
			20 (68)	2.37 - 2.63	
1	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-25, "Removal and Installation". < DTC/CIRCUIT DIAGNOSIS >

P0122, P0123 TP SENSOR

DTC Description

DTC DETECTION LOGIC

• An excessively low voltage from the TP sensor 2 is sent to ECM.

· An excessively high voltage from the TP sensor 2 is sent to ECM.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
		Diagnosis condition	Start engine and let it idle	
P0122	TP SEN 2/CIRC-B1	Signal (terminal)	Voltage signal transmitted from TP sensor 2 to ECM	
FUIZZ	(Throttle/Pedal position sensor/switch "A" circuit low)	Threshold	An excessively low voltage from the TP sen- sor 2 is sent to ECM	
		Diagnosis delay time	—	
		Diagnosis condition	Start engine and let it idle	
P0123	TP SEN 2/CIRC-B1	Signal (terminal)	Voltage signal transmitted from TP sensor 2 to ECM	
FU123	(Throttle/Pedal position sensor/switch "A" circuit high)	Threshold	An excessively high voltage from the TP sen- sor 2 is sent to ECM	
		Diagnosis delay time	_	

POSSIBLE CAUSE

P0122

- Harness or connectors (TP sensor 2 circuit is open or shorted.)
- Electric throttle control actuator (TP sensor 2)

P0123

- · Harness or connectors (TP sensor 2 circuit is open or shorted.)
- Electric throttle control actuator (TP sensor 2)

FAIL-SAFE

Engine operating condition in fail-safe mode				
Fail safe mode Vehicle behavior				
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.	M		

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0122 or P0123 is displayed with another DTC P0643, first perform the trouble diagnosis for DTC P0643.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to EC-424, "DTC Description".

NO >> GO TO 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:

EC-241

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P0122, P0123 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

Before performing the following procedure, confirm that battery voltage is more than 8 V at idle.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and let it idle for 1 second.

2. Check DTC.

Is DTC detected?

- YES >> Proceed to EC-242, "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:0000000011939778

1.CHECK DTC PRIORITY

If DTC P0122 or P0123 is displayed with another DTC P0643, first perform the trouble diagnosis for DTC P0643.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to EC-424, "DTC Description".

NO >> GO TO 2.

2.CHECK THROTTLE POSITION SENSOR 2 POWER SUPPLY

- 1. Disconnect electric throttle control actuator harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between electric throttle control actuator harness connector and ground.

	+		
Electric throttle	control actuator	_	Voltage
Connector	Terminal		
F57	5	Ground	Approx. 5 V
In the state of the second sections		•	

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

$\mathbf{3}$.check throttle position sensor 2 power supply circuit

- 1. Turn ignition switch OFF.
- 2. Disconnect ECM harness connector.
- Check the continuity between electric throttle control actuator harness connector and ECM harness connector.

Electric throttle	Electric throttle control actuator		ECM		
Connector	Terminal	Connector Terminal		Continuity	
F57	5	F14	98	Existed	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

4.CHECK THROTTLE POSITION SENSOR 2 GROUND CIRCUIT

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.

P0122, P0123 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

Electric thro	tle control act	tuator	ECM		Continuit	h.		
Connector	Termi	nal	Connector	Terminal	Continuit	•y		
F57	4		F14	75	Existed			
. Also che	eck harness	s for sh	nort to ground and	short to pov	wer.	—		
s the inspec		<u>norma</u>	<u> ?</u>					
	GO TO 5.		1					
			iit, short to ground				inectors.	
.CHECK	IHROTTLE	POSI	TION SENSOR 2	INPUT SIG	NAL CIRC			
	he continui	ty betv	veen electric throt	tle control ad	ctuator ha	arness connec	tor and ECM	harness con-
nector.								
Electric thro	tle control act	uator	ECM					
Connector	Termi		_	Terminal	Continuit	iy.		
F57	3	nui	F14	72	Existed			
-	-	o for ch						
			nort to ground and	Short to pov	wel.			
s the inspec		поппа	<u>1 (</u>					
	GO TO 6. Renair one	n circu	lit short to around	or short to r	nower in l	harness or cor	nectore	
NO >>	Repair ope		iit, short to ground	or short to p	power in I	harness or cor	inectors.	
NO >>	Repair ope [HROTTLE	POSI	TION SENSOR				inectors.	
NO >> CHECK	Repair ope	E POSI sensor	TION SENSOR				inectors.	
NO >>	Repair ope	E POSI sensor	TION SENSOR				inectors.	
NO >> CHECK T Check thrott the inspec YES >>	Repair ope THROTTLE le position stion result INSPECTIO	E POSI sensor norma ON EN	TION SENSOR : Refer to <u>EC-243</u> ! <u>?</u> ID	. "Componer	nt Inspect	<u>tion"</u> .		
NO >> CHECK T Check thrott the inspec YES >>	Repair ope THROTTLE le position stion result INSPECTIO	E POSI sensor norma ON EN	TION SENSOR . Refer to <u>EC-243</u> ! <u>?</u>	. "Componer	nt Inspect	<u>tion"</u> .		
NO >> CHECK T Check thrott the inspec YES >>	Repair ope THROTTLE le position <u>stion result</u> INSPECTIO Replace elo	E POSI sensor norma ON EN ectric t	TION SENSOR : Refer to <u>EC-243</u> ! <u>?</u> ID	. "Componer	nt Inspect	<u>tion"</u> .		- INFOID:000000011939779
NO >> CHECK T Check thrott Sthe inspective YES >> NO >> Compone	Repair ope THROTTLE le position <u>ction result</u> INSPECTIO Replace ele nt Inspec	E POSI sensor norma ON EN ectric t ction	TION SENSOR TRefer to <u>EC-243</u> 12 10 hrottle control actu	. "Componer	nt Inspect	<u>tion"</u> .		
NO >> CHECK T Check thrott Sthe inspective YES >> NO >> Compone	Repair ope THROTTLE le position <u>ction result</u> INSPECTIO Replace ele nt Inspec	E POSI sensor norma ON EN ectric t ction	TION SENSOR : Refer to <u>EC-243</u> ! <u>?</u> ID	. "Componer	nt Inspect	<u>tion"</u> .		
NO >> CHECK T Check thrott S the inspect YES >> NO >> Compone .CHECK T	Repair ope THROTTLE le position <u>ction result</u> INSPECTIO Replace elo nt Inspec THROTTLE	E POSI sensor norma ON EN ectric t ction E POSI 1 OFF.	TION SENSOR Refer to <u>EC-243</u> P D hrottle control actu TION SENSOR	, "Componer uator. Refer	nt Inspect	<u>tion"</u> .		
NO >> CHECK T Check thrott S the inspect YES >> NO >> COMPONE . CHECK T . Turn igr . Reconn	Repair ope THROTTLE le position <u>stion result</u> INSPECTIO Replace elo nt Inspeo THROTTLE ition switch ect all harn	POSI sensor norma ON EN ectric t ction POSI OFF. ess co	TION SENSOR TRefer to <u>EC-243</u> P D hrottle control actu TION SENSOR nnectors disconne	, "Componer uator. Refer t	nt Inspect	<u>tion"</u> . , "Removal an	d Installation	
NO >> CHECK T Check thrott the inspect YES >> NO >> Compone .CHECK T . Turn igr . Reconn . Perform	Repair ope THROTTLE le position ction result INSPECTIC Replace ele nt Inspec THROTTLE ition switch ect all harn Throttle Va	POSI sensor norma ON EN ectric t ction POSI OFF. ess co alve Cl	TION SENSOR Refer to <u>EC-243</u> P D hrottle control actu TION SENSOR	, "Componer uator. Refer t	nt Inspect	<u>tion"</u> . , "Removal an	d Installation	
NO >> CHECK T Check thrott the inspect YES >> NO >> Compone .CHECK T . Turn igr . Reconn . Perform . Turn igr	Repair ope THROTTLE le position <u>ction result</u> INSPECTIC Replace ele nt Inspec THROTTLE ition switch ect all harn Throttle Va ition switch	E POSI sensor norma ON EN ectric t ction E POSI D OFF. ess co alve Cl D ON.	TION SENSOR Refer to <u>EC-243</u> <u>12</u> D hrottle control actu TION SENSOR nnectors disconne osed Position Lea	, "Componer uator. Refer t	nt Inspect	<u>tion"</u> . , "Removal an	d Installation	
NO >> CHECK Check thrott the inspect YES >> NO >> Compone .CHECK C	Repair ope THROTTLE le position ction result INSPECTIC Replace ele nt Inspec THROTTLE ition switch ect all harn Throttle Va ition switch ctor lever t	POSI sensor norma ON EN ectric t ction POSI OFF. ess co alve Cl ON. o D po	TION SENSOR Refer to <u>EC-243</u> <u>12</u> D hrottle control actu TION SENSOR nnectors disconne osed Position Lea	. "Componer uator. Refer t ected. rning. Refer	nt Inspect to <u>EM-27</u>	tion". , "Removal an	<u>d Installation</u>	INFOID:0000000011939779
NO >> CHECK Check thrott the inspect YES >> NO >> Compone .CHECK C	Repair ope THROTTLE le position ction result INSPECTIC Replace ele nt Inspec THROTTLE ition switch ect all harn Throttle Va ition switch ctor lever t	POSI sensor norma ON EN ectric t ction POSI OFF. ess co alve Cl ON. o D po	TION SENSOR TION SENSOR TION SENSOR nnectors disconne osed Position Lea sition.	. "Componer uator. Refer t ected. rning. Refer	nt Inspect to <u>EM-27</u>	tion". , "Removal an	<u>d Installation</u>	INFOID:0000000011939779
NO >> CHECK Check thrott the inspect YES >> NO >> Compone .CHECK C	Repair ope THROTTLE le position ction result INSPECTIC Replace ele nt Inspec THROTTLE ition switch ect all harn Throttle Va ition switch ctor lever t	POSI sensor norma ON EN ectric t ction POSI OFF. ess co alve Cl ON. o D po	TION SENSOR TION SENSOR TION SENSOR nnectors disconne osed Position Lea sition.	. "Componer uator. Refer t ected. rning. Refer	nt Inspect to <u>EM-27</u>	tion". , "Removal an	<u>d Installation</u>	INFOID:0000000011939779
NO >> .CHECK Check thrott the inspec YES >> NO >> COMPONE .CHECK . Turn igr . Reconn . Perform . Turn igr . Set sele . Check t	Repair ope THROTTLE le position <u>ction result</u> INSPECTIO Replace elo nt Inspeo THROTTLE ition switch ect all harn Throttle Va ition switch ctor lever t he voltage	POSI sensor norma ON EN ectric t ction POSI OFF. ess co alve Cl ON. o D po	TION SENSOR Refer to <u>EC-243</u> <u>12</u> ID hrottle control actu TION SENSOR nnectors disconne osed Position Lea sition. en ECM harness c	. "Componer uator. Refer t ected. rning. Refer	nt Inspect to <u>EM-27</u>	tion". , "Removal an	<u>d Installation</u>	INFOID:0000000011939779
NO >> CHECK Check thrott the inspect YES >> NO >> Compone .CHECK C	Repair ope THROTTLE le position <u>ction result</u> INSPECTIO Replace ele nt Inspec THROTTLE ition switch ect all harn Throttle Va ition switch ctor lever t he voltage	POSI sensor norma ON EN ectric t ction DOFF. ess co alve Cl DOFF. o D po betwee	TION SENSOR Refer to <u>EC-243</u> <u>12</u> ID hrottle control actu TION SENSOR nnectors disconne osed Position Lea sition. en ECM harness c	<u>, "Componer</u> uator. Refer ected. rning. Refer	nt Inspect to <u>EM-27</u>	tion". , "Removal an 59, "Description nder the follow	<u>d Installation</u>	INFOID:0000000011939779
NO >> .CHECK Check thrott the inspec YES >> NO >> COMPONE .CHECK . Turn igr . Reconn . Perform . Turn igr . Set sele . Check t	Repair ope THROTTLE le position ction result INSPECTIC Replace ele INSPECTIC Replace ele INSPECTIC IN	POSI sensor norma ON EN ectric t ction DOFF. ess co alve Cl DOFF. o D po betwee	TION SENSOR Refer to <u>EC-243</u> <u>12</u> ID hrottle control actu TION SENSOR nnectors disconne osed Position Lea sition. en ECM harness c	<u>, "Componer</u> uator. Refer ected. rning. Refer connector ter	nt Inspect to EM-27	tion". , "Removal an 59, "Description nder the follow	<u>d Installation</u>	INFOID:0000000011939779
NO >> .CHECK Check thrott the inspec YES >> NO >> COMPONE .CHECK . Turn igr . Reconn . Perform . Turn igr . Set sele . Check t	Repair ope THROTTLE le position ction result INSPECTIO Replace elo nt Inspec THROTTLE ition switch ect all harn Throttle Va ition switch ctor lever t he voltage	POSI sensor norma ON EN ectric t ction DOFF. ess co alve Cl DOFF. o D po betwee	TION SENSOR Refer to <u>EC-243</u> <u>12</u> ID hrottle control actu TION SENSOR nnectors disconne osed Position Lea sition. en ECM harness c	. "Componer uator. Refer t ected. rning. Refer connector ter ndition	nt Inspect to <u>EM-27</u> to <u>EC-15</u> rminals un	tion". . "Removal an 	d Installation	INFOID:0000000011939779
NO >> .CHECK Check thrott the inspect YES >> NO >> COMPONE .CHECK . Turn igr . Reconn . Perform . Turn igr . Set sele . Check t	Repair ope THROTTLE le position ction result INSPECTIC Replace ele INSPECTIC Replace ele INSPECTIC IN	POSI sensor norma ON EN ectric t ction DOFF. ess co alve Cl DOFF. o D po betwee	TION SENSOR Refer to <u>EC-243</u> <u>12</u> ID hrottle control actu TION SENSOR nnectors disconne osed Position Lea sition. en ECM harness c	. "Componer Jator. Refer ected. rning. Refer connector ter ndition Fully relea Fully depre	nt Inspect to EM-27 to EC-15 rminals un	tion". 59, "Description of the follow Voltage More than 0.36 Less than 4.75	<u>d Installation</u>	INFOID:0000000011939779
NO >> CHECK T Check thrott the inspec YES >> NO >> Compone .CHECK T . Turn igr . CHECK T . Turn igr . CHECK T . Turn igr . Set sele . Check t	Repair ope THROTTLE le position ction result INSPECTIC Replace ele INSPECTIC Replace ele INSPECTIC IN	POSI sensor norma ON EN ectric t ction POSI n OFF. ess co alve CI n ON. o D po betwee	TION SENSOR Refer to EC-243 P D hrottle control actu TION SENSOR nnectors disconne osed Position Lea sition. en ECM harness c Co	. "Componer uator. Refer t ected. rning. Refer connector ter ndition	nt Inspect to EM-27 to EC-15 rminals un ased ased ased	tion". . "Removal an 	d Installation	INFOID:0000000011939779

NO >> Replace electric throttle control actuator. Refer to EM-27, "Removal and Installation".

P0125 ECT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P0125 ECT SENSOR

DTC Description

INFOID:000000011939780

[VQ35DE]

DTC DETECTION LOGIC

- 1. Voltage sent to ECM from the sensor is not practical, even when some time has passed after starting the engine.
- 2. Engine coolant temperature is insufficient for closed loop fuel control.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
			Diagnosis condition	—
			Signal (terminal)	Voltage signal transmitted from engine cool- ant temperature sensor to ECM
	ECT SENSOR	1	Threshold	Voltage sent to ECM from the sensor is not practical, even when some time has passed after starting the engine
P0125	(Insufficient coolant temperature for		Diagnosis delay time	—
	closed loop fuel control)		Diagnosis condition	—
		2	Signal (terminal)	Voltage signal transmitted from engine cool- ant temperature sensor to ECM
		2	Threshold	Engine coolant temperature is insufficient for closed loop fuel control
			Diagnosis delay time	—

POSSIBLE CAUSE

- Harness and connectors (High resistance in the circuit)
- Engine coolant temperature sensor
- Thermostat

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P00125 is displayed with DTC P0116, P0117 or P0118, first perform the trouble diagnosis for DTC P0116, P0117 or P0118.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable.
 - DTC P0116: Refer to <u>EC-236</u>, "<u>DTC Description</u>".
 DTC P0117: Refer to <u>EC-238</u>, "<u>DTC Description</u>".

 - DTC P0118: Refer to <u>EC-238, "DTC Description"</u>.

NO >> GO TO 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.

>> GO TO 3.

 ${\it 3.}$ CHECK ENGINE COOLANT TEMPERATURE SENSOR FUNCTION

With CONSULT

- 1. Turn ignition switch ON.
- Select "DATA MONITOR" mode with CONSULT. 2.

Revision: October 2015

EC-244

FUIZS ECT SENSOR	
< DTC/CIRCUIT DIAGNOSIS >	[VQ35DE]
 Check that "COOLANT TEMP/S" is above –7°C (19.4°F). With GST Follow the procedure "With CONSULT" above. 	
Is the temperature above 10°C (50°F)?	
YES >> INSPECTION END NO >> GO TO 4.	
4. PERFORM DTC CONFIRMATION PROCEDURE	
With CONSULT	
 Start engine and run it for 65 minutes at idle speed. If "COOLANT TEMP/S" increases to more than -7°C (19.4°F) within 65 minu because the test result will be OK. CAUTION: 	ites, stop engine
Never overheat engine.	
2. Check 1st trip DTC.	
With GST Follow the procedure "With CONSULT" above.	
Is 1st trip DTC detected?	
YES >> EC-245, "Diagnosis Procedure"	
NO-1 >> To check malfunction symptom before repair: Refer to GI-41, "Intermittent Incid	lent".
NO-2 >> Confirmation after repair: INSPECTION END	
Diagnosis Procedure	INFOID:000000011939781
1.CHECK DTC PRIORITY	
f DTC P00125 is displayed with DTC P0116, P0117 or P0118, first perform the trouble	diagnosis for DTC
P0116, P0117 or P0118.	
Is applicable DTC detected? YES >> Perform diagnosis of applicable.	
 YES >> Perform diagnosis of applicable. DTC P0116: Refer to <u>EC-236</u>, "DTC Description". DTC P0117: Refer to <u>EC-238</u>, "DTC Description". DTC P0118: Refer to <u>EC-238</u>, "DTC Description". NO >> GO TO 2. 	
2. CHECK ENGINE COOLANT TEMPERATURE SENSOR	
Check engine coolant temperature sensor. Refer to <u>EC-245, "Component Inspection"</u> .	
Is the inspection result normal?	
YES >> GO TO 3.	
NO >> Replace engine coolant temperature sensor.	
3.CHECK THERMOSTAT OPERATION	
When the engine is cold [lower than 70°C (158°F)] condition, grasp lower radiator hose a engine coolant does not flow.	nd confirm that the
chyline coolant does not now.	
Is the inspection result normal?	
Is the inspection result normal? YES >> INSPECTION END	
Is the inspection result normal?	
Is the inspection result normal? YES >> INSPECTION END	INFOID:000000011939782
Is the inspection result normal? YES >> INSPECTION END NO >> Repair or replace thermostat. Refer to <u>CO-23, "Removal and Installation"</u> .	INFOID:0000000011939782

P0125 ECT SENSOR

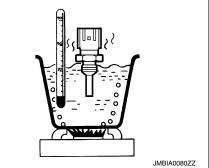
3. Remove engine coolant temperature sensor. Refer to <u>CO-25, "Exploded View"</u>.

P0125 ECT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

4. Check resistance between engine coolant temperature sensor terminals as per the following.

_	ECT :	sensor			Resistance	, , , , , , , , , , , , , , , , , , ,
	+	_	Conditio	Condition		
	Terr	ninal				
				20 (68)	2.37 - 2.63	
	1	2	Temperature [°C (°F)]	50 (122)	0.68 - 1.00	
				90 (194)	0.236 - 0.260	



[VQ35DE]

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace engine coolant temperature sensor. Refer to <u>CO-25, "Exploded View"</u>.

P0127 IAT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P0127 IAT SENSOR

DTC Description

DTC DETECTION LOGIC

Rationally incorrect voltage from the sensor is sent to ECM, compared with the voltage signal from engine coolant temperature sensor.

DTC	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition
		Diagnosis condition	_
	IAT SENSOR-B1	Signal (terminal)	Voltage signal transmitted from intake air temperature sensor to ECM
P0127	(Intake air temperature too high)	Threshold	Rationally incorrect voltage from the sensor is sent to ECM, compared with the voltage sig- nal from engine coolant temperature sensor
		Diagnosis delay time	_
 Intake air FAIL-SAFE Not applica DTC CONI 1.PRECOI 	^{ble} FIRMATION PROCEDURE NDITIONING		vays perform the following before conduct-
2. Turn ig 3. Turn ig TESTING C This test m test is expe	ected to be easier, it is unneces	st 10 seconds. e wheels lifted in the	shop or by driving the vehicle. If a road e.
~	GO TO 2.		
Z .PERFOR	RM DTC CONFIRMATION PROC		
(P)With CO		EDURE	
 Wait ur Turn ig 		less than 96°C (205°F))
 Wait ur Turn ig Select ' Check If the e engine. 	NSULT ntil engine coolant temperature is nition switch ON. "DATA MONITOR" mode with CC the engine coolant temperature. ngine coolant temperature is not	less than 96°C (205°F) NSULT.) F), turn ignition switch OFF and cool dowr
 Wait ur Turn ig Select Check If the e engine. NOTE: Perform tl Turn ig 	NSULT ntil engine coolant temperature is nition switch ON. "DATA MONITOR" mode with CC the engine coolant temperature. ngine coolant temperature is not he following steps before engine nition switch ON.	less than 96°C (205°F) NSULT. less than 96°C (205°F coolant temperature is	F), turn ignition switch OFF and cool dowr
 Wait ur Turn ig Select ' Check ' If the e engine. NOTE: Perform tl Turn ig Select ' Start er 	NSULT ntil engine coolant temperature is nition switch ON. "DATA MONITOR" mode with CC the engine coolant temperature. ngine coolant temperature is not he following steps before engine nition switch ON. "DATA MONITOR" mode with CC ngine. chicle speed at more than 70 km/	less than 96°C (205°F) NSULT. less than 96°C (205°F coolant temperature is NSULT.	[;]), turn ignition switch OFF and cool dowr above 96°C (205°F).
 Wait ur Turn ig Select Check If the e engine. NOTE: Perform ti Turn ig Select Start er Hold ve CAUTI Always 	NSULT ntil engine coolant temperature is nition switch ON. "DATA MONITOR" mode with CC the engine coolant temperature. ngine coolant temperature is not he following steps before engine nition switch ON. "DATA MONITOR" mode with CC ngine. whicle speed at more than 70 km/ ON: s drive vehicle at a safe speed. 1st trip DTC.	less than 96°C (205°F) NSULT. less than 96°C (205°F coolant temperature is NSULT.	[;]), turn ignition switch OFF and cool down above 96°C (205°F).

Is 1st trip DTC detected?

EC

INFOID:0000000011939783

P0127 IAT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

INFOID:000000011939784

- YES >> Proceed to EC-248, "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

1. CHECK INTAKE AIR TEMPERATURE SENSOR

Check intake air temperature sensor. Refer to EC-248, "Component Inspection".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace mass air flow sensor (with intake air temperature sensor).

Component Inspection

INFOID:0000000011939785

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.

Mass air f	low sensor			
+	-	Condition	Resistance (k Ω)	
Tern	ninals			
4	2	Temperature [°C (°F)]	25 (77)	1.800 - 2.200

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace mass air flow sensor. Refer to <u>EM-26, "Removal and Installation"</u>.

P0128 THERMOSTAT FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

P0128 THERMOSTAT FUNCTION

DTC Description

DTC DETECTION 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.

The engine coolant temperature does not reach to specified temperature even though the engine has run long enough.

DTC	DTC CONSULT screen terms (Trouble diagnosis content) DTC detection condition		
		Diagnosis condition	—
	THERMSTAT FNCTN	Signal (terminal)	—
P0128	[Coolant thermostat (coolant tempera- ture below thermostat regulating tem- perature)]	Threshold	The engine coolant temperature does not reach to specified temperature even though the engine has run long enough
		Diagnosis delay time	—
FAIL-SAFE Not applicat			
DTC CONF	FIRMATION PROCEDURE		
	I before and during the following p	procedure.	
1.CHECK	DTC PRIORITY		
trouble diag	28 is displayed with DTC P0300, nosis for DTC P0300, P0301, P03 <u>e DTC detected?</u>		P0304, P0305 or P0306, first perform the 305 and P0306.
	 Perform diagnosis of applicable DTC P0300: Refer to <u>EC-315</u>, " DTC P0301: Refer to <u>EC-315</u>, " DTC P0302: Refer to <u>EC-315</u>, " 	DTC Description". DTC Description". DTC Description".	
	 DTC P0303: Refer to <u>EC-315</u>, " DTC P0304: Refer to <u>EC-315</u>, " DTC P0305: Refer to <u>EC-315</u>, " DTC P0306: Refer to <u>EC-315</u>, " 	DTC Description".	
	GO TO 2.		
	NDITIONING-I		
before cond 1. Turn igr	nfirmation Procedure has been p ucting the next test. hition switch OFF and wait at least hition switch ON.		always perform the following procedure
	nition switch OFF and wait at least	t 10 seconds.	
•	GO TO 3. NDITIONING-II		
J.PRECUI			

- Turn ignition switch ON.
- 2. Check the following conditions:

INFOID:000000011939786

EC

С

P0128 THERMOSTAT FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

Ambient temperature	–10°C (14°F) or more
A/C switch	OFF
Blower fan switch	OFF

3. Select "DATA MONITOR" mode of "ENGINE" using CONSULT.

4. Check the following conditions:

COOLANT TEMP/S -10°C - 46°C (14 - 114°F)

Is the condition satisfied?

- YES >> GO TO 4.
- NO >> 1. Satisfy the condition.
 - 2. GO TO 4.

4.PERFORM DTC CONFIRMATION PROCEDURE-I

With CONSULT

1. Start engine.

2. Drive the vehicle until the following condition is satisfied. CAUTION:

Always drive vehicle at safe speed. STEP 1

Drive the vehicle under the conditions instructed below until the difference between "COOLANT TEMP/S" and "FUEL T/TMP SE" becomes at least 24°C (75°F).

COOLANT TEMP/S	65°C (149°F) or less
FUEL T/TMP SE	Less than the value calculated by sub- tracting 25°C (45°F) from "COOLANT TEMP/S".*

*:	Example	e

COOLANT 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

STEP 2

Drive the vehicle at 50 km/h (32 MPH) or more with the difference between "COOLANT TEMP/S" and "FUEL T/TMP SE" maintained at 24°C (75°F) or more.

NOTE:

Keep the accelerator pedal as steady as possible during cruising.

STEP 3

Drive the vehicle at 50 km/h (32 MPH) or more until "COOLANT TEMP/S" increases by 6°C (43°F). **NOTE:**

Keep the accelerator pedal as steady as possible during cruising.

Is the condition satisfied?

YES >> GO TO 5. NO >> GO TO 1.

5. PERFORM DTC CONFIRMATION PROCEDURE-II

(B) With CONSULT

1. Drive the vehicle until the following condition is satisfied.

COOLANT TEMP/S

65°C (149°F) or more

CAUTION:

Always drive vehicle at safe speed.

2. Check 1st trip DTC.

Is 1st trip DTC detected?

P0128 THERMOSTAT FUNCTION

	P012	8 THERM	OSTAT FUN	STION		
< DTC/CIRCUIT	DIAGNOSIS >				[VQ35DE]	
NO-1 >> To ch	eed to <u>EC-251, "Diagr</u> eck malfunction symp rmation after repair: I	otom before re	epair: Refer to Gl	-41, "Intermittent Incident".		А
Diagnosis Pro	cedure			IN	FOID:0000000011939787	
1. CHECK DTC F	PRIORITY					EC
	displayed with DTC F for DTC P0300, P030			P0304, P0305 or P0306, first 305 and P0306.	perform the	С
Is applicable DTC						
• DT(form diagnosis of app C P0300: Refer to <u>EC</u> C P0301: Refer to <u>EC</u>	<u>-315, "DTC E</u>				D
• DT(C P0302: Refer to \underline{EC} C P0302: Refer to \underline{EC} C P0303: Refer to \underline{EC}	<u>-315, "DTC E</u>	escription".			E
	C P0304: Refer to <u>EC</u> C P0305: Refer to <u>EC</u>					
	C P0306: Refer to EC					F
	NE COOLANT TEMP	FRATURE SI	-NSOR			
	plant temperature sen			nent Inspection"		G
Is the inspection r				<u>none mopocitori</u> .		0
YES >> GO T						
· ·	ace engine coolant te	mperature se	nsor.			Н
3.CHECK THER						
Check thermostat	. Refer to <u>CO-23, "Re</u> result normal?	emoval and In	<u>istallation"</u> .			
	ECTION END					
	ace thermostat. Refer	to <u>CO-23, "R</u>	emoval and Insta	<u>allation"</u> .		J
Component Ir	spection			INi	FOID:0000000011939788	
1.CHECK ENGI	NE COOLANT TEMP	ERATURE SI	ENSOR			Κ
1. Turn ignition						
	ngine coolant temper ne coolant temperatu					L
4. Check resista	ance between engine]	
terminals as p	per the following.					р. /
ECT sensor						Μ
+ _	 Conditio	n	Resistance			
Terminal	-		(kΩ)			Ν
		20 (68)	2.37 - 2.63			
1 2	Temperature [°C (°F)]	50 (122)	0.68 - 1.00			0
		90 (194)	0.236 - 0.260		JMBIA0080ZZ	
Is the inspection r						Р
YES >> INSP	ECTION END					

NO >> Replace engine coolant temperature sensor. Refer to <u>CO-25, "Exploded View"</u>.

< DTC/CIRCUIT DIAGNOSIS >

P0130, P0150 A/F SENSOR 1

DTC Description

INFOID:0000000011939789

[VQ35DE]

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.

- 1. 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.
- 2. The A/F signal computed by ECM from the A/F sensor 1 signal is constantly approx. 2.2 V.

DTC	CONSULT screen terms (Trouble diagnosis content)		DTC	C detection condition
			Diagnosis condition	-
			Signal (terminal)	The A/F signal computed by ECM
		1	Threshold	The A/F signal computed by ECM from the A/ F sensor 1 signal is constantly in a range oth- er than approx. 2.2 V
P0130	A/F SENSOR1 (B1) (O2 sensor circuit bank 1 sensor 1)		Diagnosis delay time	_
			Diagnosis condition	_
			Signal (terminal)	The A/F signal computed by ECM
		2	Threshold	The A/F signal computed by ECM from the A/ F sensor 1 signal is constantly approx. 2.2 V
			Diagnosis delay time	_
	A/F SENSOR1 (B2) (O2 sensor circuit bank 2 sensor 1)	1	Diagnosis condition	_
			Signal (terminal)	The A/F signal computed by ECM
			Threshold	The A/F signal computed by ECM from the A/ F sensor 1 signal is constantly in a range oth- er than approx. 2.2 V
P0150			Diagnosis delay time	_
			Diagnosis condition	_
			Signal (terminal)	The A/F signal computed by ECM
			Threshold	The A/F signal computed by ECM from the A/ F sensor 1 signal is constantly approx. 2.2 V
			Diagnosis delay time	—

POSSIBLE CAUSE

P0130 - 1

- Harness or connectors (The A/F sensor 1 circuit is open or shorted.)
- A/F sensor 1

P0130 - 2

- · Harness or connectors (The A/F sensor 1 circuit is open or shorted.)
- A/F sensor 1

P0150 - 1

- Harness or connectors (The A/F sensor 1 circuit is open or shorted.)
- A/F sensor 1

P0150 - 2

• Harness or connectors (The A/F sensor 1 circuit is open or shorted.)

A/F sensor 1

FAIL-SAFE Not applicable

DTC CONFIRMATION PROCEDURE

P0130, P0150 A/F SENSOR 1

< DTC/CIRCUIT DIAGNOSIS >

1.PRECONDITIONING		А
	lure has been previously conducted, always perform the following before conduct-	~
	F and wait at least 10 seconds.	EC
 Turn ignition switch ON Turn ignition switch OF 	F and wait at least 10 seconds.	LC
TESTING CONDITION:		
Before performing the follo	owing procedure, confirm that battery voltage is more than 11 V at idle.	С
>> GO TO 2.		
2.PERFORM DTC CONFI	RMATION PROCEDURE FOR MALFUNCTION 1	D
 Start engine and warm Let engine idle for 2 min Check 1st trip DTC. 	it up to normal operating temperature. nutes.	E
Is 1st trip DTC detected?		
	254, "Diagnosis Procedure".	F
NO-1 >> With CONSULT NO-2 >> With GST: GO		
3.CHECK AIR FUEL RATI	O (A/F) SENSOR 1 FUNCTION	G
	it up to normal operating temperature.	0
	or "A/F SEN1 (B2)" in "DATA MONITOR" mode with CONSULT.	Н
Does the indication fluctuate		11
YES >> GO TO 4. NO >> Proceed to EC-	254, "Diagnosis Procedure".	
	RMATION PROCEDURE FOR MALFUNCTION 2-I	I
) P1276" (for DTC P0130) or "A/F SEN1 (B2) P1286" (for DTC P0150) of "A/F	
SEN1" in "DTC WORK 2. Touch "START".	SUPPORT" mode with CONSULT.	J
	ditions are met, "TESTING" will be displayed on the CONSULT screen.	1.4
ENG SPEED	1,000 - 3,200 rpm	Κ
VHCL SPEED SE	More than 64 km/h (40 mph)	
B/FUEL SCHDL	1.0 - 10.0 msec	L
Selector lever	D position	
If "TESTING" is not di CAUTION:	splayed after 20 seconds, retry from step 2.	M
Always drive vehicle a	at a safe speed.	
Is "TESTING" displayed on	CONSULT screen?	Ν
YES >> GO TO 5. NO >> Check A/F sens	sor 1 function again. GO TO 3.	
_	RMATION PROCEDURE FOR MALFUNCTION 2-II	0
Release accelerator pedal f		0
NOTE:		
Which does "TESTING" cha	easing the accelerator pedal.	Ρ
COMPLETED>>GO TO 6.		
•	etry DTC CONFIRMATION PROCEDURE. GO TO 4.	
	RMATION PROCEDURE FOR MALFUNCTION 2-III	
Touch "SELF-DIAG RESUL	Τ".	

P0130, P0150 A/F SENSOR 1

< DTC/CIRCUIT DIAGNOSIS >

Which is displayed on CONSULT screen?

- OK-1 >> To check malfunction symptom before repair: Refer to GI-41, "Intermittent Incident".
- OK-2 >> Confirmation after repair: INSPECTION END
- NG >> Proceed to EC-254, "Diagnosis Procedure".

7.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.
- 8. Stop the vehicle.
- 9. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to EC-254, "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

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		-	Voltage
	Bank	Connector	Terminal		
P0130	1	F12	1	Ground	Battery voltage
P0150	2	F61	1	Ground	Dattery 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			IPD	/I E/R	Continuity
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0130	1	F12	1	F50	52	Existed
P0150	2	F61	1	F30	53	Existed

Is the inspection result normal?

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

NO >> Repair or replace error-detected parts.

INFOID:000000011939790

P0130, P0150 A/F SENSOR 1

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

3. CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT

- 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	
P0130	1	F12	3		66		
F 0130	I	1 12	4	F 44	67	Existed	
P0150	2	F61	3	F 14	76	Existed	
F0150	Z	FOI	4		77		

4. Check the continuity between A/F sensor 1 harness connector and ground, or ECM harness connector Е and ground.

DTC		A/F sensor 1		Ground	Continuity
DIC	Bank	Connector	Terminal	Giouna	Continuity
P0130	1	F12	3		
P0130	I	F12	4	Ground	Not evicted
D0150	2	F64	3	Ground	Not existed
P0150	2	F61	4		

DTC	E	CM	Ground	Continuity
ыс	Connector	Terminal	Ground	Continuity
P0130		66		
F0130	F14	67	Ground	Not existed
P0150	F 14	76	Giounu	Giouria Not existed
F 0 130		77	1	
5. Also ch	neck harnes	s for short to	power	

5. Also check harness for short to power.

Is the inspection result normal?

YES >> INSPECTION END

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

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< DTC/CIRCUIT DIAGNOSIS >

P0131, P0151 A/F SENSOR 1

DTC Description

INFOID:000000011939791

[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 low.

The A/F signal computed by ECM from the A/F sensor 1 signal is constantly approx. 0 V.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC	C detection condition
		Diagnosis condition	—
	A/F SENSOR1 (B1)	Signal (terminal)	The A/F signal computed by ECM
P0131	(O2 sensor circuit low voltage bank 1 sensor 1)	Threshold	The A/F signal computed by ECM from the A/ F sensor 1 signal is constantly approx. 0 V
		Diagnosis delay time	—
		Diagnosis condition	—
	A/F SENSOR1 (B2)	Signal (terminal)	The A/F signal computed by ECM
P0151	(O2 sensor circuit high voltage bank 2 sensor 1)	Threshold	The A/F signal computed by ECM from the A/ F sensor 1 signal is constantly approx. 0 V
		Diagnosis delay time	—

POSSIBLE CAUSE

P0131

- Harness or connectors (The A/F sensor 1 circuit is open or shorted.)
- A/F sensor 1

P0151

- Harness or connectors (The A/F sensor 1 circuit is open or shorted.)
- A/F sensor 1

FAIL-SAFE Not applicable

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.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. 0 V?

YES >> Proceed to <u>EC-257, "Diagnosis Procedure"</u>.

NO >> GO TO 3.

P0131, P0151 A/F SENSOR 1

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

3.PERFORM	1 DTC	CONFIRM	ATION	PROCEDI	JRE				
With CONS 1. Turn ignit 2. Turn ignit	ion swi		vait at le	east 10 sec	conds.				A
 Turn ignit Drive and CAUTION 	ion swi I accele N:	tch OFF, w erate vehic	le to mo	ore than 40	conds and th) km/h (25 N	ien restart e 1PH) within	engine. 20 seconds a	after restarting engine	EC
		ehicle at a owing cond			mately 20 cc	onsecutive	seconds.		С
ENG SPEED		1,0	00 - 3,20)0 rpm					D
VHCL SPEED S	SE	Mo	ore than 4	10 km/h (25 n	nph)				
B/FUEL SCHDI	_	1.5	5 - 9.0 ms	ec					F
Selector lever		Su	itable pos	sition					E
	roced	ure is not			s possible c n 1 minute :			at step 1, return to s	F tep
With GST Follow the pro	ocedure C detec	e "With CO ted?							G
NO-1 >> To	o checł	c malfuncti	on sym	nosis Proc ptom befor INSPECTI	re repair: Re	fer to <u>GI-4´</u>	1, "Intermitten	t Incident".	
Diagnosis I	Proce	dure						INFOID:000000011	939792
				NSOR 1 F		PPLY			J
2. Turn ignit	ion swi	tch ON.			rness conne	ctor and gro	ound.		K
		+							
DTC		A/F sensor 1		-	Volta	ige			L
	Bank	Connector	Termin	al					
P0131	1	F12	1	Groun	d Battery	voltage			Μ
P0151	2	F61	1						1
	iO TO (iO TO (iO TO (3.	<u>'</u>						Ν
2.CHECK AI			4/F) SE	NSOR 1 F		PPLY CIRC	UIT		
 Turn ignit Disconne 	ion swi ct IPDN	tch OFF. /I E/R harr	iess cor	nnector.				rness connector.	0
			ensor 1		יחסו	M E/R			Р
DTC	Ва		inector	Terminal	Connector	Terminal	Continuity		
P0131	1		-12	1	F50	52	Existed		
P0151	2	2	-61	1	1.00	53			
Is the inspecti	on resi	ult normal?							

P0131, P0151 A/F SENSOR 1

< DTC/CIRCUIT DIAGNOSIS >

- 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

- 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			
P0131	1	F12	3		66				
FUIJI	4	FIZ -	F12	F 1Z	1 12	1 112	F14	67	Existed
P0151	2	F61	3	F14	76	EXISIEU			
PUIDI	Z	FOI	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	Ground	Continuity
P0131	1	F12	3		
P0131	I	F IZ	4	Ground	Not existed
P0151	151 2 F61	E61	3	Ground	NUL EXISTED
FUISI	2	FUT	4		

DTC	EC	ECM		Continuity
DIC	Connector	Terminal	Ground	Continuity
P0131	D0121	66		Not existed
FUIJI	F14	67	- Ground	
P0151	Г 14	76		
PUIDI		77		

5. Also check harness for short to power.

Is the inspection result normal?

YES >> INSPECTION END

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

P0132, P0152 A/F SENSOR 1

< DTC/CIRCUIT DIAGNOSIS >

P0132, P0152 A/F SENSOR 1

DTC Description

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.

The A/F signal computed by ECM from the A/F sensor 1 signal is constantly approx. 5 V.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
		Diagnosis condition	-	
	A/F SENSOR1 (B1)	Signal (terminal)	The A/F signal computed by ECM	
P0132	(O2 sensor circuit high voltage bank 1 sensor 1)	Threshold	The A/F signal computed by ECM from the A/ F sensor 1 signal is constantly approx. 5 V	
		Diagnosis delay time	-	
		Diagnosis condition	-	
	A/F SENSOR1 (B2)	Signal (terminal)	The A/F signal computed by ECM	
P0152	(O2 sensor circuit high voltage bank 2 sensor 1)	Threshold	The A/F signal computed by ECM from the A/ F sensor 1 signal is constantly approx. 5 V	
		Diagnosis delay time	-	
OSSIBL	ECAUSE			
0132 Harness	or connectors (The A/F sensor 1 ci	rcuit is open or shorted	d.)	

A/F sensor 1

P0152

- Harness or connectors (The A/F sensor 1 circuit is open or shorted.)
- A/F sensor 1

FAIL-SAFE Not applicable

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.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 <u>EC-260. "Diagnosis Procedure"</u>.

NO >> GO TO 3.

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< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

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.
- 4. 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

- 1.
- 6. Check 1st trip DTC.

With GST

Follow the procedure "With CONSULT" above.

Is 1st trip DTC detected?

YES >> Proceed to EC-260, "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:000000011939794

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	—	Voltage	
	Bank	Connector	Terminal		
P0132	1	F12	1	Ground	Battery voltage
P0152	2	F61	1	Ground	Dattery 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
P0132	1	F12	1	F50	52	Existed
P0152	2	F61	1	1.50	53	LAISIEU

Is the inspection result normal?

P0132, P0152 A/F SENSOR 1

< DTC/CIRCUIT DIAGNOSIS >

- 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.

Check the continuity between A/F sensor 1 harness connector and ECM harness connector. 3.

DTC		A/F sensor 1		E	Continuity		
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity	
P0132	1	F12	3		66		
F0132	I	F 12	4	F14	67	Existed	
P0152	2	F61	3	1 14	76	LAISIEU	
P0152	Z F01		4		77	1	

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	Cround	Continuity
P0132	1	F12	3		
F 0152	I	1 12	4	Ground	Not existed
P0152	P0152 2	F61	3		
F 0152	2	101	4		

DTC	E	СМ	Ground	Continuity
DIC	Connector	Terminal	Giouna	Continuity
P0132		66		
F0132	F14	67	Ground	Not existed
P0152	1 14	76	Gibuliu	NUL EXISIEU
F0152		77		

5. Also check harness for short to power.

Is the inspection result normal?

YES >> INSPECTION END

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

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[VQ35DE]

< DTC/CIRCUIT DIAGNOSIS >

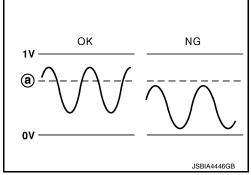
P0137, P0157 HO2S2

DTC Description

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



The maximum voltage from the sensor does not reach the specified voltage.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition			
		Diagnosis condition			
P0137	HO2S2 (B1) (O2 sensor circuit low voltage bank 1	Signal (terminal)	Voltage signal transmitted from heated oxy- gen sensor 2 to ECM		
sensor 2)		Threshold	The maximum voltage from the sensor does not reach the specified voltage		
		Diagnosis delay time	—		
		Diagnosis condition	—		
P0157	HO2S2 (B2)	Signal (terminal)	Voltage signal transmitted from heated oxy- gen sensor 2 to ECM		
F 0137	(O2 sensor circuit low voltage bank 2 sensor 2)	Threshold	The maximum voltage from the sensor does not reach the specified voltage		
		Diagnosis delay time	—		

POSSIBLE CAUSE

P0137

- Harness or connectors (The sensor circuit is open or shorted)
- Heated oxygen sensor 2
- Fuel pressure
- Fuel injector
- Intake air leakage

P0157

- Harness or connectors (The sensor circuit is open or shorted)
- Heated oxygen sensor 2
- Fuel pressure
- Fuel injector
- Intake air leakage

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.INSPECTION START

Will CONSULT be used?

Will CONSULT be used?

YES >> GO TO 2.

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< DTC/CIRCUIT DIAGNOSIS > [VC	235DE]
NO >> GO TO 5.	
2.PRECONDITIONING	A
If DTC confirmation Procedure has been previously conducted, always perform the following before or ing the next test. 1. Turn ignition switch OFF and wait at least 10 seconds.	conduct- EC
2. Turn ignition switch ON.	
3. Turn ignition switch OFF and wait at least 10 seconds.	0
TESTING CONDITION: For better results, perform "DTC WORK SUPPORT" at a temperature of 0 to 30°C (32 to 86°F).	С
>> GO TO 3.	D
3.PERFORM DTC CONFIRMATION PROCEDURE	
With CONSULT	E
 Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT. Start engine and warm it up to the normal operating temperature. 	
3. Turn ignition switch OFF and wait at least 10 seconds.	F
 Turn ignition switch ON. Turn ignition switch OFF and wait at least 10 seconds. 	I
6. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under	no load.
 Let engine idle for 1 minute. Check that "COOLANT TEMP/S" indicates more than 70°C (158°F). 	G
If not, warm up engine and go to next step when "COOLANT TEMP/S" indication reaches 70°C (1	58°F).
 Open engine hood. Select "HO2S2 (B1) P1147" (for DTC P0137) or "HO2S2 (B2) P1167" (for DTC P0157) of "HC)2S2" in H
"DTC WORK SUPPORT" mode with CONSULT.	
 Follow the instruction of CONSULT display. NOTE: 	1
It will take at most 10 minutes until "COMPLETED" is displayed. 12. Touch "SELF-DIAG RESULTS".	
Which is displayed on CONSULT screen?	J
OK-1 >> To check malfunction symptom before repair: Refer to <u>GI-41, "Intermittent Incident"</u> .	J
OK-2 >> Confirmation after repair: INSPECTION END NG >> Proceed to <u>EC-264, "Diagnosis Procedure"</u> .	
CAN NOT BE DIAGNOSED>>GO TO 4.	K
4.PERFORM DTC CONFIRMATION PROCEDURE AGAIN	
1. Turn ignition switch OFF and leave the vehicle in a cool place (soak the vehicle).	L
2. Perform DTC confirmation procedure again.	
>> GO TO 3.	M
5. PERFORM COMPONENT FUNCTION CHECK-I	
®Without CONSULT	
 Start engine and warm it up to the normal operating temperature. 	Ν
 Turn ignition switch OFF and wait at least 10 seconds. Turn ignition switch ON. 	
4. Turn ignition switch OFF and wait at least 10 seconds.	0
 Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under Let engine idle for 1 minute. 	no load.
 Check the voltage between ECM harness connector terminals under the following conditions. 	Р

< DTC/CIRCUIT DIAGNOSIS >

	ECM					
DTC +		-	Condition	Voltage		
	Connector		minal			
P0137	F13	41	35	Revving up to 4,000 rpm under no load	The voltage should be above 0.72 V at least once during this procedure.	
P0157	115	32	- 55	at least 10 times		

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 6.

6.PERFORM COMPONENT FUNCTION CHECK-II

Check the voltage between ECM harness connector terminals under the following conditions.

	DTC ECM Connector + -					
DTC			-	Condition	Voltage	
	Connector	Terminal				
P0137	F13	41	35	Keeping engine at idle for 10 minutes	The voltage should be above 0.72 V at	
P0157			- 55	Reeping engine at lue for To minutes	least once during this procedure.	

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 7.

7.PERFORM COMPONENT FUNCTION CHECK-III

Check the voltage between ECM harness connector terminals under the following conditions.

		ECM				
DTC	Connector	+	-	Condition	Voltage	
	Terminal		minal			
P0137	F13	41	35	Coasting from 80 km/h (50 MPH) with se-	The voltage should be above 0.72 V at least once during this procedure.	
P0157	115	32		lector lever in the D position		

Is the inspection result normal?

YES-1 >> To check malfunction symptom before repair: Refer to GI-41, "Intermittent Incident".

- YES-2 >> Confirmation after repair: INSPECTION END
- NO >> Proceed to <u>EC-264</u>, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000011939796

1.CLEAR MIXTURE RATIO SELF-LEARNING VALUE

- 1. Clear the mixture ratio self-learning value. Refer to EC-162, "Description".
- 2. Run engine for at least 10 minutes at idle speed.

Is the 1st trip DTC P0171 or P0174 detected? Is it difficult to start engine?

YES >> Perform trouble diagnosis for DTC P0171 or P0174. Refer to <u>EC-289, "DTC Description"</u>. NO >> GO TO 2.

2. CHECK HO2S2 GROUND CIRCUIT

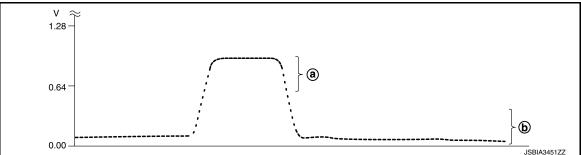
- 1. Turn ignition switch OFF.
- 2. Disconnect heated oxygen sensor 2 harness connector.
- 3. Disconnect ECM harness connector.
- 4. Check the continuity between heated oxygen sensor 2 (HO2S2) harness connector and ECM harness connector.

< DTC/CIRCUIT DIAGNOSIS >

		HO2S2		F	СМ			
DTC	Bank	Connector	Terminal	Connector	Terminal	Continuity		
P0137	1	F62	4					
P0157	2	F56	4	F13	35	Existed		
5. Also c	heck harne	ess for shor	t to around	d and short	to power.			
	ection resu		5		•			
	> GO TO 3							
			-		•		or connectors.	
5. CHECK	HO2S2 IN	NPUT SIGN	IAL CIRCU	JIT FOR O	PEN AND S	HORT		
. Check	the contin	uity betwee	en HO2S2	harness co	nnector and	d ECM harne	ess connector.	
		HO2S2		E	СМ			
DTC	Bank	Connector	Terminal	Connector	Terminal	Continuity		
P0137	1	F62	3		41			
P0157	2	F56	3	F13	32	Existed		
. Check	the contir	nuity betwe	en HO2S2	2 harness	connector a	nd ground,	or ECM harness connector and	
ground	d.							
		HO2S2				_		
DTC	Bank	Connector	Terminal	Ground	Continuity			
P0137	1	F62	3			_		
P0157	2	F56	3	Ground	Not existed			
						-		
DTO	E	ECM Continuity						
DTC	Connector	Terminal	- Ground	Continu	цу			
P0137	F13	41	Ground	Not exis	ted			
P0157	115	32	Cround	NOT CAIS	leu			
Also c	heck harne	ess for shor	t to power.					
•	ection resu							
	> GO TO 4 > Renair o		short to ar	ound or sh	ort to nower	in harness	or connectors.	
		OXYGEN S	-			in name 55		
					monontin	enection"		
	ection resu			<u>200, C(</u>	omponent In			
	> INSPEC							
-	> Replace	malfunctio					1-36. "Removal and Installation	
			Removal a	nd Installat	ion (bank 1)	<u>"</u> .		
ompon	ent Insp	ection					INFOID:000000011939797	
.INSPEC	CTION STA	ART						
/ill CONS	ULT be us	ed?						
	UITheus	ed?						
<u>Vill CONS</u> YES >:	> GO TO 2							
Vill CONS YES >: NO >:	> GO TO 2 > GO TO 3			_				

< DTC/CIRCUIT DIAGNOSIS >

- 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.
- 7. Check "HO2S2 (B1)/(B2)" at idle speed when adjusting "FUEL INJECTION" to \pm 25%.



- (a) : The voltage should be above 0.72 V at least on time.
- (b) : The voltage should be below 0.27 V at least on time.

"HO2S2 (B1)/(B2)" should be above 0.72 V at least once when the "FUEL INJECTION" is + 25%. "HO2S2 (B1)/(B2)" should be below 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-36</u>, "<u>Removal and Installation</u> (bank 2)", <u>EM-37</u>, "<u>Removal and Installation (bank 1)</u>".

3.CHECK HEATED OXYGEN SENSOR 2-I

Without CONSULT

- 1. Start engine and warm it up to the normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- 4. Let engine idle for 1 minute.
- 5. Check the voltage between ECM harness connector terminals under the following conditions.

ECM + -				Voltage	
		-	Condition		
Connector	onnector Terminal		-		
	32		D	The voltage should be above 0.72 V at least once dur	
F13	41	35	Revving up to 4,000 rpm under no load at least 10 times	ing this procedure. The voltage should be below 0.27 V at least once dur- ing 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.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

ECM Connector ECM Condition Voltage 1 32 25 Coasting from 80 km/h (50 MPH) The voltage should be above 0.72 V at least once during th procedure.		ECM				
TerminalTerminalTerminalThe roltage should be above 0.72 V at least once durin this procedure. The voltage should be below 0.27 V at least once durin this procedure. The voltage should be below 0.27 V at least once durin this procedure. The voltage should be below 0.27 V at least once durin this procedure.The voltage should be below 0.27 V at least once durin this procedure.The voltage should be below 0.27 V at least once durin this procedure.Colspan="2">The voltage should be below 0.27 V at least once durin this procedure.The voltage below 0.27 V at least once durin this procedure.ConditionVoltageTerminalTerminalThe voltage should be above 0.72 V at least once during th procedure.The voltage should be above 0.72 V at least once during th procedure.The voltage should be above 0.72 V at least once during th procedure.The voltage should be above 0.72 V at least once during th procedure.The voltage should be above 0.72 V at least once during th procedure.The voltage should be above 0.72 V at least once during th procedure.The voltage should be below 0.27 V at least once during th procedure.The voltage should be below 0.27 V at least once during th procedure.The voltage should be below 0.27 V at least once during th procedure.The voltage should be below 0.27 V at least once during th pr	Connector	+		-	Condition	Voltage
F134135Keeping engine at idle for 10 minutesthis procedure. The voltage should be below 0.27 V at least once durin this procedure.the inspection result normal? YES>> INSPECTION END NO>> GO TO 5CHECK HEATED OXYGEN SENSOR 2-III heck the voltage between ECM harness connector terminals under the following conditions.ECM connectorConditionVoltageVoltageF1332 41Coasting from 80 km/h (50 MPH) with selector lever in the D positionThe voltage should be above 0.72 V at least once during th procedure. The voltage should be below 0.27 V at least once during th procedure. The voltage should be below 0.27 V at least once during th procedure. The voltage should be below 0.27 V at least once during th procedure. The voltage should be below 0.27 V at least once during th procedure. The voltage should be below 0.27 V at least once during th procedure. The voltage should be below 0.27 V at least once during th procedure. The voltage should be below 0.27 V at least once during th procedure. The voltage should be below 0.27 V at least once during th procedure.F1335Coasting from 80 km/h (50 MPH) with selector lever in the D positionWD>> INSPECTION END NONO>> Replace malfunctioning heated oxygen sensor 2. Refer to EM-36, "Removal and Installat		Terminal				
the inspection result normal? (ES >> INSPECTION END IO >> GO TO 5. CHECK HEATED OXYGEN SENSOR 2-III heck the voltage between ECM harness connector terminals under the following conditions. Image: terminal strength in the process of the selector lever in the D position Voltage Image: terminal selector lever in the D position The voltage should be above 0.72 V at least once during the procedure. Image: terminal selector lever in the D position The voltage should be below 0.27 V at least once during the procedure. Image: terminal selector lever in the D position The voltage should be below 0.27 V at least once during the procedure. Image: terminal selector lever in the D position The voltage should be below 0.27 V at least once during the procedure. Image: terminal selector lever in the D position The voltage should be below 0.27 V at least once during the procedure. Image: terminal selector lever in the D position The voltage should be below 0.27 V at least once during the procedure. Image: terminal selector lever in the D position The voltage should be below 0.27 V at least once during the procedure. Image: terminal selector lever in the D position The voltage should be below 0.27 V at least once during the procedure. Image: terminal selector lever in the D position The voltage should be below 0.27 V at least once	F13					this procedure. The voltage should be below 0.27 V at least once during
+ - Condition Voltage Terminal - Condition Voltage F13 32 - - The voltage should be above 0.72 V at least once during the procedure. F13 35 Coasting from 80 km/h (50 MPH) with selector lever in the D position The voltage should be below 0.27 V at least once during the procedure. the inspection result normal? - - - YES >> INSPECTION END - - IO >> Replace malfunctioning heated oxygen sensor 2. Refer to EM-36, "Removal and Installat	ES >> IO >> .CHECK	INSPE GO TO HEATEI	CTION E 5. D OXYG	END EN SEN		
+ - Condition Voltage Terminal - Condition Voltage F13 32 - - The voltage should be above 0.72 V at least once during the procedure. F13 41 35 Coasting from 80 km/h (50 MPH) with selector lever in the D position The voltage should be below 0.27 V at least once during the procedure. the inspection result normal? - - - - ES >> INSPECTION END - - - O >> Replace malfunctioning heated oxygen sensor 2. Refer to EM-36, "Removal and Installat		5014				
32 The voltage should be above 0.72 V at least once during the procedure. 41 35 Coasting from 80 km/h (50 MPH) with selector lever in the D position The voltage should be below 0.27 V at least once during the procedure. the inspection result normal? YES >> INSPECTION END Poster of the procedure of the procedure. IO >> Replace malfunctioning heated oxygen sensor 2. Refer to EM-36, "Removal and Installated the procedure.		+			Condition	Voltage
 INSPECTION END >> Replace malfunctioning heated oxygen sensor 2. Refer to <u>EM-36, "Removal and Installat</u> 	F13	32				The voltage should be below 0.27 V at least once during this
	ES >> 10 >>	INSPE Replace	CTION E e malfu	END nctioning		sor 2. Refer to <u>EM-36, "Removal and Installatio</u>
	ES >> 0 >>	INSPE Replace	CTION E e malfu	END nctioning		sor 2. Refer to <u>EM-36, "Removal and Installatio</u>
	/ES >> NO >>	INSPE Replace	CTION E e malfu	END nctioning		sor 2. Refer to <u>EM-36, "Removal and Installatio</u>
	ES >> O >>	INSPE Replace	CTION E e malfu	END nctioning		sor 2. Refer to <u>EM-36, "Removal and Installatio</u>
	′ES >> 10 >>	INSPE Replace	CTION E e malfu	END nctioning		sor 2. Refer to <u>EM-36, "Removal and Installation</u>

< DTC/CIRCUIT DIAGNOSIS >

P0138, P0158 HO2S2

DTC Description

INFOID:000000011939798

[VQ35DE]

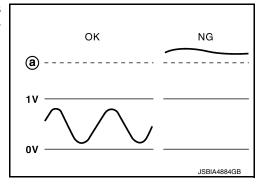
DTC DETECTION LOGIC

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 1

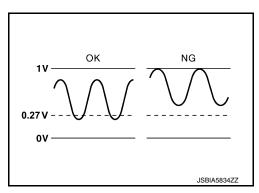
To judge the malfunctions of heated oxygen sensor 2, ECM monitors whether the voltage is unusually high during various driving conditions such as fuel cut.

(a) : 1.3 V



MALFUNCTION 2

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.



- 1. An excessively high voltage from the sensor is sent to ECM.
- 2. The minimum voltage from the sensor is not reached to the specified voltage.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
			Diagnosis condition	-
			Signal (terminal)	Voltage signal transmitted from heated oxy- gen sensor 2 to ECM
		1	Threshold	An excessively high voltage from the sensor is sent to ECM
P0138	HO2S2 (B1) (O2 sensor circuit high voltage bank 1 sensor 2)		Diagnosis delay time	-
F 0 130		2	Diagnosis condition	-
			Signal (terminal)	Voltage signal transmitted from heated oxy- gen sensor 2 to ECM
			Threshold	The minimum voltage from the sensor is not reached to the specified voltage
			Diagnosis delay time	—

< DTC/CIRCUIT DIAGNOSIS >

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			Diagnosis condition	—	
		1	Signal (terminal)	Voltage signal transmitted from heated oxy- gen sensor 2 to ECM	A
			Threshold	An excessively high voltage from the sensor is sent to ECM	EC
P0158	HO2S2 (B2) (O2 sensor circuit high voltage bank		Diagnosis delay time	-	
F0130	2 sensor2)		Diagnosis condition	—	C
			Signal (terminal)	Voltage signal transmitted from heated oxy- gen sensor 2 to ECM	0
		2	Threshold	The minimum voltage from the sensor is not reached to the specified voltage	D
			Diagnosis delay time	_	
POSSIBLE	CAUSE				Е
P0138 - 1					

 Harness or connectors (The sensor circuit is open or shorted) Heated oxygen sensor 2 	
 P0138 - 2 Harness or connectors (The sensor circuit is open or shorted) Heated oxygen sensor 2 Fuel pressure Fuel injector 	
 P0158 - 1 Harness or connectors (The sensor circuit is open or shorted) Heated oxygen sensor 2 	
P0158 - 2	

- Harness or connectors (The sensor circuit is open or shorted)
- Heated oxygen sensor 2
- Fuel pressure
- Fuel injector

FAIL-SAFE

Not applicable

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 1

- 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-271, "Diagnosis Procedure".
- NO-1 >> With CONSULT: GO TO 3.

< DTC/CIRCUIT DIAGNOSIS >

NO-2 >> Without CONSULT: GO TO 5.

3. PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION 2

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.
- 8. Check that "COOLANT TEMP/S" indicates more than 70°C (158°F).
- If not, warm up engine and go to next step when "COOLANT 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-1 >> To check malfunction symptom before repair: Refer to <u>GI-41, "Intermittent Incident"</u>.
- OK-2 >> Confirmation after repair: INSPECTION END
- NG >> Proceed to <u>EC-271, "Diagnosis Procedure"</u>.

CON NOT BE DIAGNOSED>>GO TO 4.

4.PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION 2 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-1

Without CONSULT

- 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 the voltage between ECM harness connector terminals under the following conditions.

	ECM					
DTC	DTC Connector		-	Condition	Voltage	
	Connector	Terminal		-		
P0138	F13	41	35	Revving up to 4,000 rpm under no load	The voltage should be below 0.27 V at	
P0158				at least 10 times	least once during this procedure.	

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 6.

6.PERFORM COMPONENT FUNCTION CHECK-2

Check the voltage between ECM harness connector terminals under the following conditions.

< DTC/CIRCUIT DIAGNOSIS >

А ECM DTC + Condition Voltage _ Connector Terminal EC P0138 41 Keeping engine speed at idle for 10 The voltage should be below 0.27 V F13 35 minutes at least once during this procedure. P0158 32 С

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 7.

7.PERFORM COMPONENT FUNCTION CHECK-3

Check the voltage between ECM harness connector terminals under the following conditions.

		ECM				
DTC	Connector	+	-	Condition	Voltage	
	Connector	Term	inal			F
P0138	F13	41	35	Coasting from 80 km/h (50 MPH) with se-	The voltage should be below 0.27 V at	
P0158	115	32		lector lever in the D position	least once during this procedure.	G

Is the inspection result normal?

YES-1 >> To check malfunction symptom before repair: Refer to GI-41, "Intermittent Incident".

- YES-2 >> Confirmation after repair: INSPECTION END
- >> Proceed to EC-271, "Diagnosis Procedure". NO

Diagnosis Procedure	INFOID:0000000011939799	
1.INSPECTION START		I
Confirm the detected malfunction (A or B). Refer to <u>EC-268, "DTC Description"</u> . <u>Which malfunction is detected?</u> A >> GO TO 2.		J
B >> GO TO 6. 2.CHECK HO2S2 CONNECTOR FOR WATER		Κ
 Disconnect heated oxygen sensor 2 harness connector. Check that water is not inside connectors. Is the inspection result normal? 		L
YES >> GO TO 3. NO >> Repair or replace harness or connectors. 3. CHECK HO2S2 GROUND CIRCUIT		M
 Disconnect heated oxygen sensor 2 harness connector. Disconnect ECM harness connector. Check the continuity between heated oxygen sensor 2 (HO2S2) harness connector and connector. 		Ν

DTC		HO2S2		E	Continuity	
ыс	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0138	1	F62	4	F13	35	Existed
P0158	2	F56	4	115	55	LAISIEU

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

Is the inspection result normal?

YES >> GO TO 4.

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

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< DTC/CIRCUIT DIAGNOSIS >

4.CHECK HO2S2 INPUT SIGNAL CIRCUIT

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

DTC		HO2S2		E	Continuity	
ыс	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0138	1	F62	3	F13	41	Existed
P0158	2	F56	3	113	32	LAISIEU

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	F62	3	Ground	Not existed
P0158	2	F56	3	Ground	

DTC	E	CM	Ground	Continuity	
DIC	Connector	Terminal	Ground		
P0138	F13	41	Ground	Not existed	
P0158	1 15	32	Ground	NUL EXISTED	

3. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 5.

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

5.CHECK HEATED OXYGEN SENSOR 2

Check heated oxygen sensor 2. Refer to EC-273, "Component Inspection".

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Replace malfunctioning heated oxygen sensor 2. Refer to <u>EM-36</u>, "<u>Removal and Installation</u> (bank 2)", <u>EM-37</u>, "<u>Removal and Installation (bank 1)</u>".

6.CLEAR MIXTURE RATIO SELF-LEARNING VALUE

- 1. Clear the mixture ratio self-learning value. Refer to EC-162, "Description".
- 2. Run engine for at least 10 minutes at idle speed.

Is the 1st trip DTC P0172 or P0175 detected? Is it difficult to start engine?

YES >> Perform trouble diagnosis for DTC P0172, P0175. Refer to <u>EC-294, "DTC Description"</u>. NO >> GO TO 7.

NO >> GO TO 7. 7

7.CHECK HO2S2 GROUND CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect heated oxygen sensor 2 harness connector.
- 3. Disconnect ECM harness connector.
- 4. Check the continuity between HO2S2 harness connector and ECM harness connector.

DTC		HO2S2		ECM		Continuity
ыс	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0138	1	F62	4	F13	35	Existed
P0158	2	F56	4	113	55	LAISLEU

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

Is the inspection result normal?

YES >> GO TO 8.

Revision: October 2015



< DTC/CIRCUIT DIAGNOSIS >

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

8.CHECK HO2S2 INPUT SIGNAL CIRCUIT

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

DTC	HO2S2			E	Continuity	
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0138	1	F62	3	F13	41	Existed
P0158	2	F56	3	113	32	LAISIEU

 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	F62	3	Ground	Not existed
P0158	2	F56	3	Ground	NUL EXISTEN

DTC	E	СМ	Ground	Continuity	
DIC	Connector	Terminal	Cround	Continuity	
P0138	F13	41	Ground	Not existed	
P0158			Ground	NUL EXISTED	

3. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 9.

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

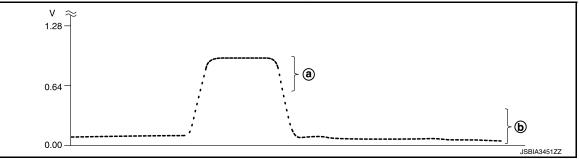
9.CHECK HEATED OXYGEN SENSOR 2

	J
Check heated oxygen sensor 2. Refer to EC-273, "Component Inspection"	
Is the inspection result normal?	
YES >> INSPECTION END	Κ
NO >> Replace malfunctioning heated oxygen sensor 2. Refer to <u>EM-36. "Removal and Installation</u> (bank 2)", <u>EM-37. "Removal and Installation (bank 1)"</u> .	
Component Inspection	L
1.INSPECTION START	B. 6
Will CONSULT be used?	IVI
Will CONSULT be used?	
YES >> GO TO 2.	NI
NO >> GO TO 3.	IN
2.CHECK HEATED OXYGEN SENSOR 2	
With CONSULT Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT. Start engine and warm it up to the normal operating temperature.	0

- 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.

< DTC/CIRCUIT DIAGNOSIS >

7. Check "HO2S2 (B1)/(B2)" at idle speed when adjusting "FUEL INJECTION" to \pm 25%.



- (a) : The voltage should be above 0.72 V at least on time.
- (b) : The voltage should be below 0.27 V at least on time.

"HO2S2 (B1)/(B2)" should be above 0.72 V at least once when the "FUEL INJECTION" is + 25%. "HO2S2 (B1)/(B2)" should be below 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-36, "Removal and Installation (bank 2)", EM-37, "Removal and Installation (bank 1)".

3.CHECK HEATED OXYGEN SENSOR 2-1

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 + – Terminal					
		_	Condition	Voltage	
		ninal			
	32			The voltage should be above 0.72 V at least once during this	
F13	41	35	Revving up to 4,000 rpm under no load at least 10 times	procedure. 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				
	32			The voltage should be above 0.72 V at least once during this	
F13	41	35	Keeping engine at idle for 10 minutes	procedure. The voltage should be below 0.27 V at least once during this procedure.	

YES >> INSPECTION END

NO >> GO TO 5.

5.CHECK HEATED OXYGEN SENSOR 2-III

< DTC/CIRCUIT DIAGNOSIS >

Check the voltage between ECM harness connector terminals under the following conditions.

	ECM				
Connector	+	-	Condition	Voltage	EC
Connector	Terminal		*		
	32			The voltage should be above 0.72 V at least once dur-	
F13	41	35	Coasting from 80 km/h (50 MPH) with selector lever in the D position	ing this procedure. The voltage should be below 0.27 V at least once dur- ing this procedure.	С

Is the inspection result normal?

YES >> INSPECTION END

NO	>> Replace malfunctioning heated oxygen sensor 2. Refer to EM-36, "Removal and Installation
	(bank 2)", EM-37, "Removal and Installation (bank 1)".

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< DTC/CIRCUIT DIAGNOSIS >

P0139, P0159 HO2S2

DTC Description

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.

The switching time between rich and lean of a heated oxygen sensor 2 signal delays more than the specified time computed by ECM.

DTC	CONSULT screen terms (Trouble diagnosis content)	D	TC detection condition
		Diagnosis condition	_
		Signal (terminal)	Heated oxygen sensor 2 signal
P0139	HO2S2 (B1) (O2 sensor circuit slow response bank 1 sensor 2)	Threshold	The switching time between rich and lean of a heated oxygen sensor 2 signal delays more than the specified time computed by ECM
		Diagnosis delay time	-
		Diagnosis condition	-
		Signal (terminal)	Heated oxygen sensor 2 signal
P0159	HO2S2 (B2) (O2 sensor circuit slow response bank 2 sensor2)	Threshold	The switching time between rich and lean of a heated oxygen sensor 2 signal delays more than the specified time computed by ECM
		Diagnosis delay time	—

POSSIBLE CAUSE

P0139

- · Harness or connectors (The sensor circuit is open or shorted)
- Heated oxygen sensor 2
- Fuel pressure
- EVAP system
- Intake air system

P0159

- Harness or connectors (The sensor circuit is open or shorted)
- Heated oxygen sensor 2
- Fuel pressure
- EVAP system
- Intake air system

FAIL-SAFE Not applicable

DTC CONFIRMATION PROCEDURE

1.INSPECTION START

Do you have CONSULT? Do you have CONSULT?

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INFOID:0000000011939801

	IT DIAGNOSIS >	[VQ35DE
YES >> GO) TO 2.	-
	D TO 7.	
.PRECONDI	TIONING	
efore conduct	ing the next test.	previously conducted, always perform the following procedure
	on switch OFF and wait at lea on switch ON.	ist 10 seconds.
•	on switch OFF and wait at lea	ist 10 seconds.
ESTING CON	IDITION:	
or better res	ults, perform "DTC WORK S	SUPPORT" at a temperature of 0 to 30°C (32 to 86°F).
) TO 3.	
PERFORM	DTC CONFIRMATION PROC	JEDURE
With CONS		
	e and warm it up to the norm	A MONITOR" mode with CONSULT.
Turn ignitio	on switch OFF and wait at lea	
	on switch ON. on switch OFF and wait at lea	est 10 seconds
		l between 3,500 and 4,000 rpm for at least 1 minute under no load
Let engine	idle for 1 minute.	·
		dicates more than 70°C (158°F). km/h (38MPH) and maintain the speed.
		Khim (John Tr) and maintain the speed.
	ive vehicle at a safe speed.	
	e accelerator pedal fully at le	east 5 seconds.
CAUTION		ast 5 seconds.
• Enable t • Always	he engine brake. drive carefully.	
CAUTION Enable t Always Never approximately 	: he engine brake. drive carefully. oply brake when releasing t	
 CAUTION Enable t Always Never application Repeat stepents 	he engine brake. drive carefully.	the accelerator pedal.
CAUTION • Enable t • Always • Never ap . Repeat ste 2. Check the	he engine brake. drive carefully. oply brake when releasing t p 9 and 10 at least 8 times. following item of "DATA MON	t he accelerator pedal. NITOR".
 CAUTION Enable t Always Never approximation Repeat steepends 	he engine brake. drive carefully. oply brake when releasing t op 9 and 10 at least 8 times. following item of "DATA MON Data monitor item	the accelerator pedal.
CAUTION • Enable t • Always • Never ap Repeat ste 2. Check the	he engine brake. drive carefully. oply brake when releasing t p 9 and 10 at least 8 times. following item of "DATA MON Data monitor item HO2 S2 DIAG1 (B1)	t he accelerator pedal. NITOR".
CAUTION • Enable t • Always o • Never ap . Repeat ster . Check the DTC	he engine brake. drive carefully. oply brake when releasing t op 9 and 10 at least 8 times. following item of "DATA MON Data monitor item HO2 S2 DIAG1 (B1) HO2 S2 DIAG2 (B1)	t he accelerator pedal. NITOR".
CAUTION • Enable t • Always of • Never ap . Repeat ster . Check the DTC	he engine brake. drive carefully. oply brake when releasing t p 9 and 10 at least 8 times. following item of "DATA MON Data monitor item HO2 S2 DIAG1 (B1) HO2 S2 DIAG2 (B1) HO2 S2 DIAG1 (B2)	the accelerator pedal. NITOR".
CAUTION • Enable t • Always o • Never ap • Repeat ste 2. Check the DTC P0139 P0159	he engine brake. drive carefully. oply brake when releasing t p 9 and 10 at least 8 times. following item of "DATA MON Data monitor item HO2 S2 DIAG1 (B1) HO2 S2 DIAG2 (B1) HO2 S2 DIAG2 (B2)	the accelerator pedal. NITOR".
CAUTION • Enable t • Always o • Never ap . Repeat ster 2. Check the DTC P0139 P0159 <u>"CMPLT" dis</u>	he engine brake. drive carefully. oply brake when releasing t p 9 and 10 at least 8 times. following item of "DATA MON Data monitor item HO2 S2 DIAG1 (B1) HO2 S2 DIAG2 (B1) HO2 S2 DIAG1 (B2) HO2 S2 DIAG2 (B2) played on CONSULT screen	the accelerator pedal. NITOR".
CAUTION • Enable t • Always o • Never ap . Repeat ste 2. Check the DTC P0139 P0159 <u>"CMPLT" dis</u> (ES >> GO	he engine brake. drive carefully. oply brake when releasing t p 9 and 10 at least 8 times. following item of "DATA MON Data monitor item HO2 S2 DIAG1 (B1) HO2 S2 DIAG2 (B1) HO2 S2 DIAG2 (B2) HO2 S2 DIAG2 (B2) played on CONSULT screen D TO 6.	the accelerator pedal. NITOR". Status CMPLT 2
CAUTION • Enable t • Always o • Never ap • Repeat ste 2. Check the DTC P0139 P0159 <u>"CMPLT" dis</u> (ES >> GC VO-1: "CMPL	he engine brake. drive carefully. oply brake when releasing t p 9 and 10 at least 8 times. following item of "DATA MON Data monitor item HO2 S2 DIAG1 (B1) HO2 S2 DIAG2 (B1) HO2 S2 DIAG2 (B2) HO2 S2 DIAG2 (B2) played on CONSULT screen D TO 6.	the accelerator pedal. NITOR". Status CMPLT ? 1>Perform DTC confirmation procedure again.
CAUTION • Enable t • Always o • Never ap • Repeat ste 2. Check the DTC P0139 P0159 <u>"CMPLT" dis</u> ZES >> GO NO-1: "CMPL NO-2: "CMPL	he engine brake. drive carefully. oply brake when releasing t p 9 and 10 at least 8 times. following item of "DATA MON Data monitor item HO2 S2 DIAG1 (B1) HO2 S2 DIAG2 (B1) HO2 S2 DIAG2 (B2) HO2 S2 DIAG2 (B2) played on CONSULT screen D TO 6. T" is not displayed on DIAG 1	the accelerator pedal. NITOR". Status CMPLT ? 1>Perform DTC confirmation procedure again.
CAUTION • Enable t • Always of • Never ap • Repeat ste 2. Check the DTC P0139 P0159 <u>"CMPLT" dis</u> <u>'ES</u> >> GO NO-1: "CMPL NO-2: "CMPL	he engine brake. drive carefully. oply brake when releasing t oply brake when releasing t Data monitor item HO2 S2 DIAG1 (B1) HO2 S2 DIAG2 (B1) HO2 S2 DIAG2 (B2) HO2 S2 DIAG2 (B2) played on CONSULT screen O TO 6. T" is not displayed on DIAG 1 T" is not displayed on DIAG 2 DTC WORK SUPPORT	the accelerator pedal. NITOR". Status CMPLT ? 1>Perform DTC confirmation procedure again.
CAUTION • Enable t • Always of • Never ap • Repeat ste • Check the DTC P0139 P0159 <u>"CMPLT" dis</u> (ES >> GC IO-1: "CMPL IO-2: "CMPL • PERFORM Open engi Select "HC	he engine brake. drive carefully. oply brake when releasing t op 9 and 10 at least 8 times. following item of "DATA MON Data monitor item HO2 S2 DIAG1 (B1) HO2 S2 DIAG2 (B1) HO2 S2 DIAG2 (B2) played on CONSULT screen D TO 6. T" is not displayed on DIAG 1 T" is not displayed on DIAG 2 DTC WORK SUPPORT ne hood. D2S2 (B1) P0139" or "HO2S2	the accelerator pedal. NITOR". Status CMPLT ? 1>Perform DTC confirmation procedure again.
CAUTION • Enable t • Always o • Never ap • Repeat ste • Check the DTC P0139 P0159 <u>*CMPLT" dis</u> (ES >> GC IO-1: "CMPL IO-2: "CMPL • PERFORM Open engi Select "HC CONSULT	he engine brake. drive carefully. oply brake when releasing t p 9 and 10 at least 8 times. following item of "DATA MON Data monitor item HO2 S2 DIAG1 (B1) HO2 S2 DIAG2 (B1) HO2 S2 DIAG2 (B2) HO2 S2 DIAG2 (B2) played on CONSULT screen D TO 6. T" is not displayed on DIAG 1 T" is not displayed on DIAG 2 DTC WORK SUPPORT ne hood. D2S2 (B1) P0139" or "HO2S2	Status Status CMPLT ? 1>>Perform DTC confirmation procedure again. 2>>GO TO 4.
CAUTION CAU	he engine brake. drive carefully. oply brake when releasing t op 9 and 10 at least 8 times. following item of "DATA MON Data monitor item HO2 S2 DIAG1 (B1) HO2 S2 DIAG2 (B1) HO2 S2 DIAG2 (B2) played on CONSULT screen D TO 6. T" is not displayed on DIAG 1 T" is not displayed on DIAG 2 DTC WORK SUPPORT ne hood. D2S2 (B1) P0139" or "HO2S2	Status Status CMPLT ? 1>>Perform DTC confirmation procedure again. 2>>GO TO 4.
CAUTION • Enable t • Always of • Never ap • Repeat step • Check the DTC P0139 P0159 *CMPLT" dis (ES >> GC VO-1: "CMPL VO-2: "CMPL VO-2: "CMPL VO-2: "CMPL VO-2: "CMPL VO-2: "CMPL VO-1: "CMPL VO-2: "CMPL VO-1: "CMPL VO-2: "CMPL VO-1: "CMPL VO-1: "CMPL VO-2: "CMPL VO-1:	he engine brake. drive carefully. oply brake when releasing t p 9 and 10 at least 8 times. following item of "DATA MON Data monitor item HO2 S2 DIAG1 (B1) HO2 S2 DIAG2 (B1) HO2 S2 DIAG2 (B2) HO2 S2 DIAG2 (B2) played on CONSULT screen D TO 6. T" is not displayed on DIAG 1 T" is not displayed on DIAG 2 DTC WORK SUPPORT ne hood. D2S2 (B1) P0139" or "HO2S2	the accelerator pedal. NITOR". Status CMPLT CMPLT 2 1>>Perform DTC confirmation procedure again. 2>>GO TO 4. 2 (B2) P0159" of "HO2S2" in "DTC WORK SUPPORT" mode wit f CONSULT display.
CAUTION • Enable t • Always of • Never ap • Never ap • Never ap • DTC P0139 P0159 <u>*CMPLT* dis</u> (ES >> GO NO-1: *CMPL • OPERFORM Open engin Select *HO CONSULT Start engin NOTE: It will take	he engine brake. drive carefully. oply brake when releasing t p 9 and 10 at least 8 times. following item of "DATA MON Data monitor item HO2 S2 DIAG1 (B1) HO2 S2 DIAG2 (B1) HO2 S2 DIAG2 (B2) played on CONSULT screen D TO 6. T" is not displayed on DIAG 1 T" is not displayed on DIAG 2 DTC WORK SUPPORT ne hood. D2S2 (B1) P0139" or "HO2S2 is and follow the instruction o	the accelerator pedal. NITOR". Status CMPLT CMPLT ? 1>>Perform DTC confirmation procedure again. 2>>GO TO 4. 2 (B2) P0159" of "HO2S2" in "DTC WORK SUPPORT" mode wit f CONSULT display. MPLETED" is displayed.
CAUTION	he engine brake. drive carefully. oply brake when releasing t p 9 and 10 at least 8 times. following item of "DATA MON Data monitor item HO2 S2 DIAG1 (B1) HO2 S2 DIAG2 (B1) HO2 S2 DIAG2 (B2) HO2 S2 DIAG2 (B2) played on CONSULT screen D TO 6. T" is not displayed on DIAG 1 T" is not displayed on DIAG 2 DTC WORK SUPPORT ne hood. D2S2 (B1) P0139" or "HO2S2 ie and follow the instruction o at most 10 minutes until "COI D" displayed on CONSULT screen D TO 6.	the accelerator pedal. NITOR". Status CMPLT CMPLT ? 1>>Perform DTC confirmation procedure again. 2>>GO TO 4. 2 (B2) P0159" of "HO2S2" in "DTC WORK SUPPORT" mode wit f CONSULT display. MPLETED" is displayed.
CAUTION • Enable t • Always of • Never ap 1. Repeat ste 2. Check the DTC P0139 P0159 <u>"CMPLT" dis</u> (ES >> GO NO-1: "CMPL • CMPL • CMPLT" dis (ES >> GO NO-2: "CMPL • CMPL • C	he engine brake. drive carefully. oply brake when releasing t p 9 and 10 at least 8 times. following item of "DATA MON Data monitor item HO2 S2 DIAG1 (B1) HO2 S2 DIAG2 (B1) HO2 S2 DIAG2 (B2) played on CONSULT screen D TO 6. T" is not displayed on DIAG 1 T" is not displayed on DIAG 2 DTC WORK SUPPORT ne hood. D2S2 (B1) P0139" or "HO2S2 ie and follow the instruction o at most 10 minutes until "COI ED" displayed on CONSULT screen	the accelerator pedal. NITOR". Status CMPLT CMPLT 2 1>>Perform DTC confirmation procedure again. 2>>GO TO 4. 2 2 (B2) P0159" of "HO2S2" in "DTC WORK SUPPORT" mode with f CONSULT display. MPLETED" is displayed. screen?

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< DTC/CIRCUIT DIAGNOSIS >

2. Perform DTC confirmation procedure again.

>> GO TO 3.

6.PERFORM SELF-DIAGNOSIS

With CONSULT

Perform ECM self-diagnosis.

Is DTC "P0139" or "P0159" detected?

- YES >> Proceed to EC-279, "Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-41, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

7.PERFORM COMPONENT FUNCTION CHECK-I

Without CONSULT

- 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 the voltage between ECM harness connector terminals under the following conditions.

		ECM				
DTC	DTC Connector	+	-	Condition	Voltage	
		Terminal				
P0139	F13	41	35	Revving up to 4,000 rpm under no	A change of voltage should be more than	
P0159				load at least 10 times	0.28 V for 1 second during this procedure.	

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 8.

8.PERFORM COMPONENT FUNCTION CHECK-II

Check the voltage between ECM harness connector terminals under the following conditions.

	ECM					
DTC	Connector	+	-	Condition	Voltage	
		Terr	ninal			
P0139	F13	41	35	Keeping engine at idle for 10 min-	A change of voltage should be more than	
P0159	115	32		utes	0.28 V for 1 second during this procedure.	

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 9.

9.PERFORM COMPONENT FUNCTION CHECK-III

Check the voltage between ECM harness connector terminals under the following conditions.

	ECM					
DTC	Connector	+	-	Condition	Voltage	
		Terminal				
P0139	F13 41		35	Coasting from 80 km/h (50 MPH) in	A change of voltage should be more than	
P0159	115	32		D position	0.28 V for 1 second during this procedure.	

Is the inspection result normal?

< DTC/CII	RCUIT DIA	GNOSIS	> .	•••••			[VQ35DE]	
YES-2 >	> Confirma	tion after r	epair: INSF	n before rep PECTION El is Procedure	ND	o <u>GI-41, "Interm</u> i	ttent Incident".	A
Diagnos	is Proce	dure					INFOID:000000011939802	EC
1.CLEAR		RATIO SE	ELF-LEARI	NING VALUI	E			EC
					o <u>EC-162, "</u>	Description".		С
	ngine for a			•	tected? Is i	t difficult to start	engine?	-
YES >	 Perform <u>Descripti</u> GO TO 2 	trouble dia <u>on"</u> or <u>EC-</u> ?.	agnosis foi 294, "DTC		71, P0174		75. Refer to <u>EC-289, "DTC</u>	D
2.CHECK	K HO2S2 G		IRCUIT					Е
 Discol Discol 	nnect ECM	ed oxygen harness c	onnector.	arness conn I oxygen sei		2S2) harness c	onnector and ECM harness	F
DTC		HO2S2		EC	M	Continuity		G
	Bank	Connector	Terminal	Connector	Terminal	Continuity		
P0139 P0159	1	F62 F56	4	F13	35	Existed		Н
YES > NO > 3. CHECH	K HO2S2 IN	8. pen circuit, NPUT SIGN	NAL CIRCU	JIT		in harness or co		J
								Κ
DTC		HO2S2		EC		Continuity		
P0139	Bank 1	Connector F62	Terminal 3	Connector	Terminal 41			L
P0159	2	F56	3	F13	32	Existed		
	the contir			2 harness c		nd ground, or E	CM harness connector and	M
DTC		HO2S2		Ground	Continuity	-		Ν
	Bank	Connector	Terminal			_		
P0139 P0159	1	F62 F56	3	Ground	Not existed			0
			~			-		
DTO	E	CM	0					Р
DTC	Connector	Terminal	- Ground	I Continuit	ty			
P0139 P0159	F13	41 32	- Ground	Not existe	ed			

3. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 4.

< DTC/CIRCUIT DIAGNOSIS >

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-280, "Component Inspection".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace malfunctioning heated oxygen sensor 2. Refer to <u>EM-36</u>, "<u>Removal and Installation</u> (bank 2)", <u>EM-37</u>, "<u>Removal and Installation (bank 1)</u>".

Component Inspection

1.INSPECTION START

Will CONSULT be used?

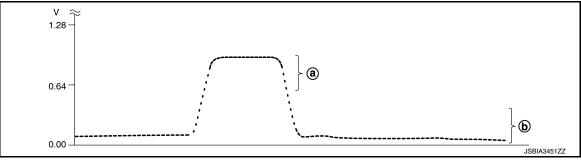
Will CONSULT be used?

YES >> GO TO 2.

NO >> GO TO 3.

2.CHECK HEATED OXYGEN SENSOR 2

- 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%.



(a) : The voltage should be above 0.72 V at least on time.

(b) : The voltage should be below 0.27 V at least on time.

"HO2S2 (B1)/(B2)" should be above 0.68 V at least once when the "FUEL INJECTION" is + 25%. "HO2S2 (B1)/(B2)" should be below 0.18 V at least once when the "FUEL INJECTION" is -25%.

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Replace malfunctioning heated oxygen sensor 2. Refer to <u>EM-36</u>, "<u>Removal and Installation</u> (bank 2)", <u>EM-37</u>, "<u>Removal and Installation</u> (bank 1)".

3.CHECK HEATED OXYGEN SENSOR 2-1

Without CONSULT

- 1. Start engine and warm it up to the normal operating temperature.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- 4. Let engine idle for 1 minute.
- 5. Check the voltage between ECM harness connector terminals under the following conditions.

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< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

YES >> INSPECTION END NO >> GO TO 4. •• CHECK HEATED OXYGEN SENSOR 2-II heck the voltage between ECM harness connector terminals under the following conditions. ECM Condition Voltage Connector $+$ $-$ Condition F13 32 Treminal 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. The voltage should be below 0.27 V at least once during this procedure. 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. • CHECK HEATED OXYGEN SENSOR 2-III heck the voltage between ECM harness connector terminals under the following conditions. • Connector $+$ $-$ • Condition Voltage • Connector $+$ $-$ • Condition Voltage • Condition Voltage • Terminal Condition Voltage • Target in the D position The voltage should be above 0.72 V at least once during this procedure. • F13 32 Coasting from 80 km/h (50 MPH) with selector lever in the D position The voltage should be below 0.27 V at least once during this procedure. • The inspect	Connector Terminal 32 32 F13 32 41 35 Revving up to 4,000 rpm under no load at least 10 times atte inspection result normal? YES >> INSPECTION END NO >> GO TO 4. •.CHECK HEATED OXYGEN SENSOR 2-II theck the voltage between ECM harness connector terminals ECM Connector + Terminal 2 32 F13 32 41 35 Keeping engine at idle for 10 min- T tts F13 35 Keeping engine at idle for 10 min- T tts At1 35 Keeping engine at idle for 10 min- T tts the inspection result normal? YES >> INSPECTION END NO >> GO TO 5.	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. Under the following conditions. Voltage 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				
F13 32 13 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. S the inspection result normal? YES >> INSPECTION END NO >> GO TO 4. The voltage should be below 0.27 V at least once during this procedure. YES >> INSPECTION END NO >> GO TO 4. CHECK HEATED OXYGEN SENSOR 2-II The voltage should be above 0.72 V at least once during this procedure. Connector + - Condition Voltage F13 32	32324135Revving up to 4,000 rpm under no load at least 10 timess the inspection result normal?YES >> INSPECTION END NO >> GO TO 4.A.CHECK HEATED OXYGEN SENSOR 2-IICheck the voltage between ECM harness connector terminalsECM Connector4-ConditionTerminal32F1332F1332Keeping engine at idle for 10 min- utesT ConditionConditionT ConditionT ConnectorF1332F1332Keeping engine at idle for 10 min- utesT ConditionT T T T T tSthe inspection result normal? YESYES >> INSPECTION END NONO >> GO TO 5.	this procedure. The voltage should be below 0.27 V at least once during this procedure. Under the following conditions. Voltage 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				
F134135Revving up to 4,000 rpm under no load at least 10 timesthis procedure. 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-IIConditionVoltageCheck the voltage between ECM harness connector terminals under the following conditions.ECM ConnectorConditionVoltageF1332 4135Keeping engine at idle for 10 min- utesThe 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. The voltage should be below 0.27 V at least once during this procedure. The voltage should be below 0.27 V at least once during this procedure.YES>> INSPECTION END NO>> GO TO 5.Society of the voltage should be below 0.27 V at least once during this procedure. The voltage should be below 0.27 V at least once during this procedure.VES>> INSPECTION END NO>> Go TO 5.ConditionVoltageConditionVoltageF1332 41ConditionVoltageF1332 	F134135Revving up to 4,000 rpm under no load at least 10 timesIs the inspection result normal? YES >> INSPECTION END NO >> GO TO 4.SENSOR 2-IICheck the voltage between ECM harness connector terminalsECM Connector-F1332 41ConditionSt the inspection result normal? TerminalTIs the inspection result normal? NO >> GO TO 4.TF1332 41SKeeping engine at idle for 10 min- utesTIs the inspection result normal? YES >> INSPECTION END NO >> GO TO 5.S	this procedure. The voltage should be below 0.27 V at least once during this procedure. Under the following conditions. Voltage 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				
Image: state inspection result normal? This procedure. 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 + - Connector F13 32 41 35 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 least once during this procedure. St 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. 5. Check the voltage between ECM harness connector terminals under the following conditions. 5. Connector + - Condition Voltage f13 31 60 TO 5. Coasting from 80 km/h (50 MPH) with selector lever in the D position F13 32 60 TO 5. Coasting fr	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 ECM Connector + - Connector + - Connector + - Connector + - Connector * + - Condition * 32 F13 35 Keeping engine at idle for 10 min- t tt * Is the inspection result normal? YES >> INSPECTION END NO >> GO TO 5.	this procedure. Under the following conditions. Voltage 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				
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NO >> Replace malfunctioning heated oxygen sensor 2. Refer to EM-36, "Removal and Installation	Is the inspection result normal?					

P014C, P014D, P014E, P014F, P015A, P015B, P015C, P015D A/F SENSOR 1 < DTC/CIRCUIT DIAGNOSIS > [VQ35DE]

P014C, P014D, P014E, P014F, P015A, P015B, P015C, P015D A/F SENSOR

DTC Description

INFOID:000000011939807

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.

The response time of a A/F sensor 1 signal delays more than the specified time computed by ECM.

DTC	CONSULT screen terms (Trouble diagnosis content)	E	DTC detection condition
		Diagnosis condition	—
		Signal (terminal)	A/F sensor 1 signal
P014C	A/F SENSOR1 (B1) (O2 sensor slow response - rich to lean bank 1 sensor 1)	Threshold	The response time of a A/F sensor 1 signal delays more than the specified time computed by ECM
		Diagnosis delay time	—
		Diagnosis condition	-
		Signal (terminal)	A/F sensor 1 signal
P014D	A/F SENSOR1 (B1) (O2 sensor slow response - lean to rich bank 1 sensor 1)	Threshold	The response time of a A/F sensor 1 signal delays more than the specified time computed by ECM
		Diagnosis delay time	—
		Diagnosis condition	-
	A/F SENSOR1 (B2)	Signal (terminal)	A/F sensor 1 signal
P014E	(O2 sensor slow response - rich to lean bank 2 sensor 1)	Threshold	The response time of a A/F sensor 1 signal delays more than the specified time computed by ECM
		Diagnosis delay time	—
		Diagnosis condition	-
P014F		Signal (terminal)	A/F sensor 1 signal
	A/F SENSOR1 (B2) (O2 sensor slow response - lean to rich bank 2 sensor 1)	Threshold	The response time of a A/F sensor 1 signal delays more than the specified time comput- ed by ECM
		Diagnosis delay time	
		Diagnosis condition	-
		Signal (terminal)	A/F sensor 1 signal
P015A	A/F SENSOR1 (B1) (O2 sensor delayed response - rich to lean bank 1 sensor 1)	Threshold	The response time of a A/F sensor 1 signal delays more than the specified time computed by ECM
		Diagnosis delay time	—
		Diagnosis condition	-
		Signal (terminal)	A/F sensor 1 signal
P015B	A/F SENSOR1 (B1) (O2 sensor delayed response - lean to rich bank 1 sensor 1)	Threshold	The response time of a A/F sensor 1 signal delays more than the specified time computed by ECM
		Diagnosis delay time	—

P014C, P014D, P014E, P014F, P015A, P015B, P015C, P015D A/F SENSOR 1 [VQ35DE] < DTC/CIRCUIT DIAGNOSIS >

		Diagnosis condition	l —	
	A/F SENSOR1 (B2)	Signal (terminal)	A/F sensor 1 signal	A
P015C	(O2 sensor delayed response - rich to lean bank 2 sensor 1)	Threshold	The response time of a A/F sensor 1 signal delays more than the specified time computed by ECM	EC
		Diagnosis delay time	-	
	A/F SENSOR1 (B2) (O2 sensor delayed response - lean to rich bank 2 sensor 1)	Diagnosis condition	—	C
		Signal (terminal)	A/F sensor 1 signal	0
P015D		Threshold	The response time of a A/F sensor 1 signal delays more than the specified time computed by ECM	D
		Diagnosis delay time	—	

POSSIBLE CAUSE

POSSIBLE CAUSE	Е
 P014C Harness or connectors (The A/F sensor 1 circuit is open or shorted.) A/F sensor 1 	F
 P014D Harness or connectors (The A/F sensor 1 circuit is open or shorted.) A/F sensor 1 	G
P014EHarness or connectors (The A/F sensor 1 circuit is open or shorted.)A/F sensor 1	Η
 P014F Harness or connectors (The A/F sensor 1 circuit is open or shorted.) A/F sensor 1 	
 P015A Harness or connectors (The A/F sensor 1 circuit is open or shorted.) A/F sensor 1 	J
 P015B Harness or connectors (The A/F sensor 1 circuit is open or shorted.) A/F sensor 1 	K
 P015C Harness or connectors (The A/F sensor 1 circuit is open or shorted.) A/F sensor 1 	L
 P015D Harness or connectors (The A/F sensor 1 circuit is open or shorted.) A/F sensor 1 	M
FAIL-SAFE Not applicable	Ν
DTC CONFIRMATION PROCEDURE	
1.PRECONDITIONING	0
If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test. Turn ignition switch OFF and wait at least 10 seconds. Turn ignition switch ON. Turn ignition switch OFF and wait at least 10 seconds. TESTING CONDITION:	Ρ
Before performing the following procedure, confirm that battery voltage is more than 11 V at idle.	
Do you have CONSULT?	

YES	>> GO TO 2.
NO	>> GO TO 6.

Revision: October 2015

P014C, P014D, P014E, P014F, P015A, P015B, P015C, P015D A/F SENSOR 1

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

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.
- 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. Increase the engine speed up to about 3,600 rpm and keep it for 10 seconds.
- 8. Fully release accelerator pedal and then let engine idle for about 1 minute.
- 9. Check the items status of "DATA MONITOR" as follows.
 - NOTE:

If "PRSNT" changed to "ABSNT", refer to EC-182, "Component Function Check".

DTC	Data monitor item	Status
 P014C P014D P015A P015B 	A/F SEN1 DIAG3 (B1)	PRSNT
 P014E P014F P015C P015D 	A/F SEN1 DIAG3 (B2)	
Is "PRSNT" displayed on	CONSULT scroon2	

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 <u>EC-182</u>, "Component Function Check".

4.PERFORM DTC CONFIRMATION PROCEDURE-2

(B) 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-182, "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)	GWPLI
 P014F P015C P015D 	A/F SEN1 DIAG2 (B2)	

Is "CMPLT" displayed on CONSULT screen?

- YES >> GO TO 5.
- NO >> Refer to EC-182, "Component Function Check".

5.PERFORM SELF-DIAGNOSIS

P014C, P014D, P014E, P014F, P015A, P015B, P015C, P015D A/F SENSOR 1

< DTC/CIRCUIT DIAGNOSIS >

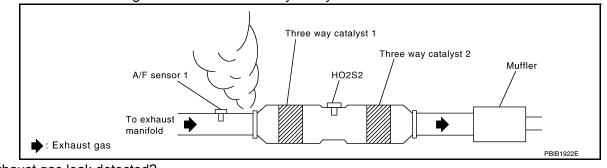
[VQ35DE]

< DTC/CIRCUIT DIAGNOSIS > [VQ35DE]	
Is any DTC detected?	
YES >> Proceed to <u>EC-285, "Diagnosis Procedure"</u> . NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-41, "Intermittent Incident"</u> .	A
NO-2 >> Confirmation after repair: INSPECTION END 6.CHECK AIR-FUEL RATIO SELF-LEARNING VALUE	EC
With GST	
 Start engine and warm it up to normal operating temperature. Select Service \$01 with GST. Calculate the total value of "Short term fuel trim" and "Long term fuel trim" indications. 	С
Is the total percentage within ±15%? YES >> GO TO 8. NO >> GO TO 7.	D
7. DETECT MALFUNCTIONING PART	F
Check the following. Intake air leaks Exhaust gas leaks Incorrect fuel pressure 	F
 Lack of fuel Fuel injector Incorrect PCV hose connection PCV valve Mass air flow sensor 	G
	Н
>> Repair or replace malfunctioning part.	
8.PERFORM DTC CONFIRMATION PROCEDURE	
 Turn ignition switch OFF and wait at least 10 seconds. Turn ignition switch ON. Turn ignition switch OFF and wait at least 10 seconds. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load. 	J
 Let engine idle for 1 minute. Increase the engine speed up to about 3,600 rpm and keep it for 10 seconds. Fully release accelerator pedal and then let engine idle for about 1 minute. Check 1st trip DTC. 	K
Is 1st trip DTC detected? YES >> Proceed to EC-285, "Diagnosis Procedure". NO-1 >> To check malfunction symptom before repair: Refer to GI-41, "Intermittent Incident". NO-2 >> Confirmation after repair: INSPECTION END	L
Diagnosis Procedure	M
1.RETIGHTEN A/F SENSOR 1	
Loosen and retighten the A/F sensor 1. Refer to EM-36, "Removal and Installation (bank 2)", EM-37, "Removal and Installation (bank 1)".	Ν
>> GO TO 2.	0
2.CHECK EXHAUST GAS LEAK	
1. Start engine and run it at idle.	Ρ

P014C, P014D, P014E, P014F, P015A, P015B, P015C, P015D A/F SENSOR 1 [VQ35DE]

< DTC/CIRCUIT DIAGNOSIS >

2. Listen for an exhaust gas leak before three way catalyst 1.



Is exhaust gas leak detected?

YES >> Repair or replace.

NO >> GO TO 3.

3. CHECK FOR INTAKE AIR LEAK

Listen for an intake air leak after the mass air flow sensor.

Is intake air leak detected?

YES >> Repair or replace.

NO >> GO TO 4.

 ${f 4}$. CLEAR THE MIXTURE RATIO SELF-LEARNING VALUE

- Clear the mixture ratio self-learning value. Refer to EC-162, "Description".
- Run engine for at least 10 minutes at idle speed. 2.

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 EC-289. "DTC Description" or EC-294, "DTC Description".

NO >> GO TO 5.

 ${f b}.$ CHECK AIR FUEL RATIO (A/F) SENSOR 1 POWER SUPPLY

1. Disconnect A/F sensor 1 harness connector.

- 2. Turn ignition switch ON.
- Check the voltage between A/F sensor 1 harness connector and ground. 3.

DTC		A/F sensor	1	Ground	Voltage
DIC	Bank	Connector	Terminal	Giouna	voltage
 P014C P014D P015A P015B 	1	F12	1	Ground	Battery voltage
 P014E P014F P015C P015D 	2	F61	1	Ground	Ballery vollage

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.

P014C, P014D, P014E, P014F, P015A, P015B, P015C, P015D A/F SENSOR 1 [VQ35DE]

< DTC/CIRCUIT DIAGNOSIS >

DTC		A/F sensor	1	IPDM E/R		Continuity
	Bank	Connector	Terminal	Connector	Terminal	Continuity
 P014C P014D P015A P015B 	1	F12	1	F50	52	- Existed
 P014E P014F P015C P015D 	2	F61	1	130	53	

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.

Check the continuity between A/F sensor 1 harness connector and ECM harness connector. 3.

DTC B	A/F sensor 1			ECM		Continuity
	Bank	Connector	Terminal	Connector	Terminal	Continuity
• P014C			3		66	
P014DP015AP015B	1	F12	4	F14	67	Existed
• P014E			3	F 14	76	Existed
P014FP015CP015D	2	F61	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	Ground	Continuity	
DIC	Bank Connector		Terminal		Cround
• P014C		F12	3	- Ground	Not existed
P014DP015AP015B	1		4		
• P014E		F61	3		
P014FP015CP015D	2		4		

DTC		ECM	Ground	Continuity	
DIC	Bank	Connector	Terminal	Ground	Continuity
• P014C		F14	66	Ground	Not existed
P014DP015AP015B	1		67		
P014EP014F	2		76		
P014PP015CP015D			77		

5. Also check harness for short to power. А

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P014C, P014D, P014E, P014F, P015A, P015B, P015C, P015D A/F SENSOR 1 [VQ35DE]

< DTC/CIRCUIT DIAGNOSIS >

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 AIR FUEL RATIO (A/F) SENSOR 1 HEATER

Check air fuel ratio (A/F) sensor 1 heater. Refer to EC-209, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace malfunctioning air fuel ratio (A/F) sensor 1. Refer to EM-36, "Removal and Installation (bank 2)", EM-37, "Removal and Installation (bank 1)".

9.CHECK MASS AIR FLOW SENSOR

Check both mass air flow sensor (bank 1 and bank 2). Refer to EC-223, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 10.

>> Replace malfunctioning mass air flow sensor. Refer to EM-26, "Removal and Installation". NO

10.CHECK PCV VALVE

Check PCV valve. Refer to EC-585, "Work Procedure".

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Repair or replace PCV valve. Refer to EC-15, "ENGINE CONTROL SYSTEM : Component Parts Location".

< DTC/CIRCUIT DIAGNOSIS >

P0171, P0174 FUEL INJECTION SYSTEM FUNCTION

DTC Description

INFOID:000000011939809

[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	

1. Fuel injection system does not operate properly.

2. The amount of mixture ratio compensation is too large. (The mixture ratio is too lean.)

DTC	CONSULT screen terms (Trouble diagnosis content)		D	TC detection condition
			Diagnosis condition	Start engine and let it idleStart engine and drive the vehicle
			Signal (terminal)	
		1	Threshold	Fuel injection system does not operate prop- erly.
P0171	FUEL SYS-LEAN-B1		Diagnosis delay time	_
(System too lean bank 1)	(System too lean bank 1)		Diagnosis condition	Start engine and let it idleStart engine and drive the vehicle
		2	Signal (terminal)	_
		2	Threshold	The amount of mixture ratio compensation is too large. (The mixture ratio is too lean.)
			Diagnosis delay time	
			Diagnosis condition	Start engine and let it idleStart engine and drive the vehicle
			Signal (terminal)	
			Threshold	Fuel injection system does not operate prop- erly.
P0174	FUEL SYS-LEAN-B2		Diagnosis delay time	-
(Systen	(System too lean bank 2)		Diagnosis condition	Start engine and let it idleStart engine and drive the vehicle
		0	Signal (terminal)	—
		2	Threshold	The amount of mixture ratio compensation is too large. (The mixture ratio is too lean.)
			Diagnosis delay time	

POSSIBLE CAUSE

P0171

- Intake air leakage
- A/F sensor 1
- Fuel injector
- Exhaust gas leakage
- Incorrect fuel pressure
- Lack of fuel
- Mass air flow sensor

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< DTC/CIRCUIT DIAGNOSIS >

Incorrect PCV hose connection

P0174

- Intake air leakage
- A/F sensor 1
- · Fuel injector
- Exhaust gas leakage
- Incorrect fuel pressure
- Lack of fuel
- · Mass air flow sensor
- Incorrect PCV hose connection

FAIL-SAFE

Not applicable

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 EC-162. "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-291, "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?

YES >> Proceed to EC-291, "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.

Check 1st trip DTC.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

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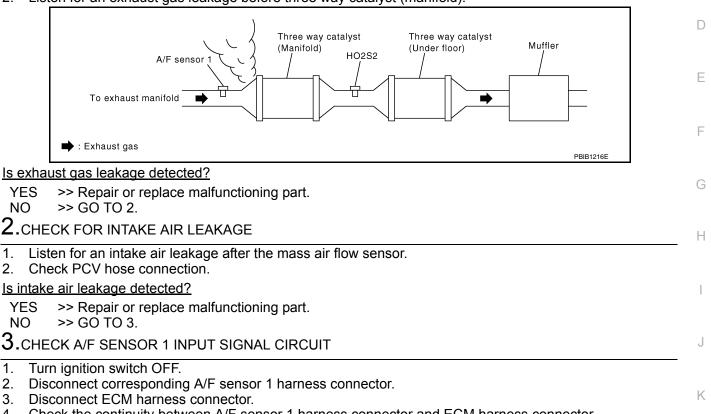
Is 1st trip DTC detected?

- YES >> Proceed to EC-291, "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

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).



4. Check the continuity between A/F sensor 1 harness connector and ECM harness connector.

DTC		A/F sensor 1		EC	Continuity							
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity						
P0171	1	F12	3		66							
FUITI	I	112	112	1 12	1 12	1 12	1 12	112	4	F14	67	Existed
P0174	2	F61	3		76	Existed						
F0174	2	FUI	4		77							

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					
DIC	Bank	Connector	Terminal	Ground	Continuity				
P0171	1	1 F12 -	3						
FUITI	I		1 12	F IZ	1 112	4	4	Ground	Not existed
P0174	2 F61		F61	3	Ground	NUL EXISTED			
F0174		2 F61 4		FOI	4				

< DTC/CIRCUIT DIAGNOSIS >

DTC	EC	CM	Ground	Continuity	
DIC	Connector	Terminal	Ground	Continuity	
P0171 P0174		66			
	F14	67	Ground	Not existed	
		76	Ground	NUL EXISTED	
		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 <u>EC-168, "Work Procedure"</u>.
- Install fuel pressure gauge kit [SST: (J-44321)] and check fuel pressure. Refer to <u>EC-168, "Work Proce-dure"</u>.

At idling: Approximately 350 kPa (3.5 bar, 3.57 kg/cm², 51 psi)

Is the inspection result normal?

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

5. DETECT MALFUNCTIONING PART

Check fuel hoses and fuel tubes for clogging.

Is the inspection result normal?

- YES >> Replace "fuel filter and fuel pump assembly". Refer to <u>FL-5. "Removal and Installation"</u>.
- NO >> Repair or replace malfunctioning part.

6.CHECK MASS AIR FLOW SENSOR

With CONSULT

- 1. Install all removed parts.
- Check "MASS AIR FLOW" in "DATA MONITOR" mode with CONSULT. For specification, refer to <u>EC-587, "Mass Air Flow Sensor"</u>.

With GST

- 1. Install all removed parts.
- Check mass air flow sensor signal in Service \$01 with GST. For specification, refer to <u>EC-587, "Mass Air Flow Sensor"</u>.

Is the measurement value within the specification?

- YES >> GO TO 7.
- NO >> Check connectors for rusted terminals or loose connections in the mass air flow sensor circuit or ground. Refer to <u>EC-227, "Diagnosis Procedure"</u>.

7.CHECK FUNCTION OF FUEL INJECTOR

With CONSULT

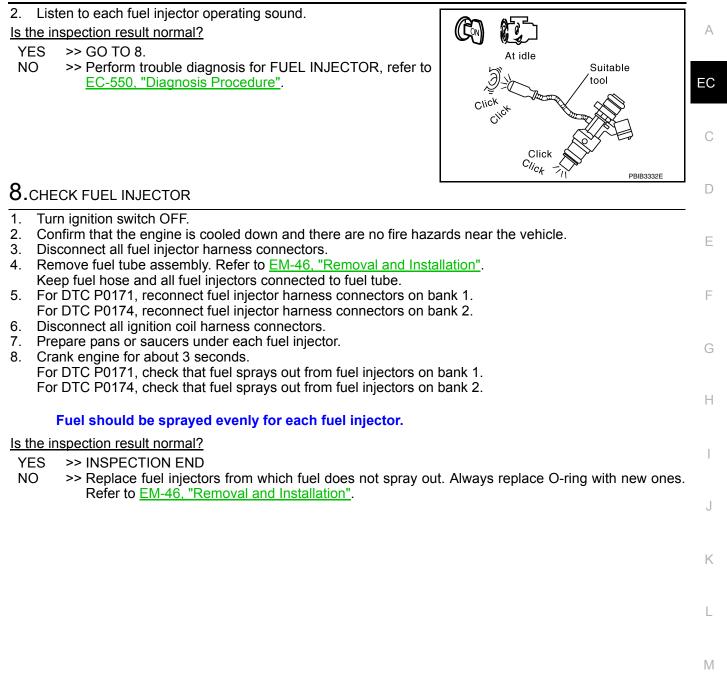
- 1. Start engine.
- 2. Perform "POWER BALANCE" in "ACTIVE TEST" mode with CONSULT.
- 3. Check that each circuit produces a momentary engine speed drop.

With GST

1. Let engine idle.

< DTC/CIRCUIT DIAGNOSIS >

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< DTC/CIRCUIT DIAGNOSIS >

P0172, P0175 FUEL INJECTION SYSTEM FUNCTION

DTC Description

INFOID:000000011939811

[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 rich), the ECM judges the condition as the fuel injection system malfunction and illuminates the MIL (2 trip detection logic).

Sensor	Input signal to ECM	ECM function	Actuator	
A/F sensor 1	Density of oxygen in exhaust gas (Mixture ratio feedback signal)	Fuel injection control	Fuel injector	

1. Fuel injection system does not operate properly.

2. The amount of mixture ratio compensation is too large. (The mixture ratio is too rich.)

DTC	CONSULT screen terms (Trouble diagnosis content)		D	TC detection condition
			Diagnosis condition	 Clear the mixture ratio self-learning value and start engine and let it idle Start engine and drive the vehicle
		1	Signal (terminal)	_
			Threshold	Fuel injection system does not operate properly.
D0172	FUEL SYS-RICH-B1		Diagnosis delay time	-
P0172 (Syster	(System too rich bank 1)		Diagnosis condition	 Clear the mixture ratio self-learning value and start engine and let it idle Start engine and drive the vehicle
		2	Signal (terminal)	—
			Threshold	The amount of mixture ratio compensation is too large. (The mixture ratio is too rich.)
			Diagnosis delay time	-
		1	Diagnosis condition	 Clear the mixture ratio self-learning value and start engine and let it idle Start engine and drive the vehicle
			Signal (terminal)	_
			Threshold	Fuel injection system does not operate properly.
P0175	FUEL SYS-RICH-B2		Diagnosis delay time	—
F0175	(System too rich bank 2)		Diagnosis condition	 Clear the mixture ratio self-learning value and start engine and let it idle Start engine and drive the vehicle
		2	Signal (terminal)	-
			Threshold	The amount of mixture ratio compensation is too large. (The mixture ratio is too rich.)
			Diagnosis delay time	-

POSSIBLE CAUSE

P0172

- · Intake air leakage
- A/F sensor 1
- · Fuel injector
- Exhaust gas leakage
- Incorrect fuel pressure

P0172, P0175 FUE < DTC/CIRCUIT DIAGNOSIS >	EL INJECTION SYSTEM FUNCTION	[VQ35DE]
Mass air flow sensor		[100000]
P0175		А
 Intake air leakage A/F sensor 1 Fuel injector Expansion loakage 		EC
Exhaust gas leakageIncorrect fuel pressureMass air flow sensor		С
FAIL-SAFE Not applicable		
DTC CONFIRMATION PROCEDURE		D
1.preconditioning		
If DTC Confirmation Procedure has been p ing the next test. 1. Turn ignition switch OFF and wait at le	previously conducted, always perform the following befonest 10 seconds.	re conduct- E
 Turn ignition switch ON. Turn ignition switch OFF and wait at le 	ast 10 seconds.	F
>> GO TO 2. 2.PERFORM DTC CONFIRMATION PRO)CEDURE-I	G
 Clear the mixture ratio self-learning va Start engine. 		Н
Is it difficult to start engine? YES >> GO TO 3. NO >> GO TO 4.		I
3. RESTART ENGINE		
If it is difficult to start engine, the fuel inject Crank engine while depressing accelerator NOTE:		J
	ree-fourths (3/4) or more, the control system does need at too much.	ot start the K
Does engine start?		
YES >> Proceed to <u>EC-296, "Diagnosis</u> NO >> Check exhaust and intake air I		L
4.PERFORM DTC CONFIRMATION PRO	OCEDURE-II	
1. Keep engine idle for at least 5 minutes).	M
2. Check 1st trip DTC. Is 1st trip DTC detected?		
YES >> Proceed to EC-296. "Diagnosis NO >> GO TO 5.	<u>s Procedure"</u> .	Ν
5.PERFORM DTC CONFIRMATION PRC	CEDURE-III	
 Turn ignition switch OFF and wait at le Start engine. 	ast 10 seconds.	0
 Maintain the following conditions for at Hold the accelerator pedal as steady a 		P
VHCL SPEED SE	50 - 120 km/h (31 - 75 mph)	
CAUTION: Always drive vehicle at a safe speed	J.	

Always drive vehicle at a safe speed.4. Check 1st trip DTC.

Is 1st trip DTC detected?

< DTC/CIRCUIT DIAGNOSIS >

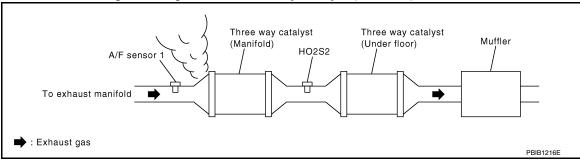
[VQ35DE]

- YES >> Proceed to EC-296, "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:000000011939812

- 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.

DTC		A/F sensor 1			ECM						
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity					
P0172	1	F12	3		66						
FUITZ	1 112	F IZ	1 12	1 12		1 12	4	4	F14	67	Existed
P0175	2	F61	3	F 14	76	Existed					
F 0173	2	FOI	гот	F01 -	F01 -	4		77	•		

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				
DIC	Bank	Connector	Terminal	Ground	Continuity			
P0172	1 F12	20172 1 E12	3					
F0172		FIZ	1 12	F IZ	112	4	4	Ground
P0175	2	F61	3	Ground	NUL EXISIEU			
F0175	2	FUT	4					

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

DTO	E	СМ	One of	Operation 11	
DTC -	Connector	Terminal	Ground	Continuity	_
P0172		66			
10172	F14	67	Ground	Not existed	
P0175		76			
		77			
		s for short to	power.		
	ction result	normal?			
-	GO TO 4. Repair ope	n circuit, sho	ort to around	d or short to	power in harness or connectors.
	FUEL PRES		sit to ground		
	-		Refer to FC	-168, "Work	Procedure"
					heck fuel pressure. Refer to <u>EC-168, "Work Proce-</u>
<u>dure"</u> .				·	
A 4 1-	lling: Appr	ovimately 2	50 kDo /2 5	bar 2 57 k	n/cm^2 E1 nsi)
			ou kra (3.5	o bai, 3.57 K	ŋ/cm², 51 psi)
	ction result GO TO 5.	normal?			
-		uel filter and	fuel pump a	assembly". R	efer to FL-5, "Removal and Installation".
	-	FLOW SEN		,	
With CO					
Install a	Il removed				
					with CONSULT.
With GS		eier to <u>EC-50</u>	<u>or, mass A</u>	ir Flow Sens	<u>or</u> .
Install a	Il removed				
				ice \$01" with <u>ir Flow Sens</u>	
•		lue within the			<u>01</u> .
	GO TO 6.		opponioau	<u>011.</u>	
	Check con				connections in the mass air flow sensor circuit or
_	-			sis Procedure	<u> </u>
CHECK	FUNCTION	OF FUEL II	NJECTOR		
With CO					
Start en		BALANCE" i	n "ACTIVE	TEST" mode	with CONSULT.
				itary engine	
With GS		-			
Let eng		injector oper	rating sound	4	
	ction result				
•	GO TO 7.				At idle
10 >>				L INJECTOF	R, refer to
	<u>ЕС-550, "</u> [Diagnosis Pro	<u>ocedure"</u> .		tool
					Click

7. CHECK FUEL INJECTOR

< DTC/CIRCUIT DIAGNOSIS >

- 1. Remove fuel injector assembly. Refer to <u>EM-46</u>, "<u>Removal and Installation</u>". Keep fuel hose and all fuel injectors connected to fuel tube.
- 2. Confirm that the engine is cooled down and there are no fire hazards near the vehicle.
- 3. 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 >> INSPECTION END
- NO >> Replace the fuel injectors from which fuel is dripping. Always replace O-ring with new one. Refer to EM-46, "Removal and Installation".

< DTC/CIRCUIT DIAGNOSIS >

P0181 FTT SENSOR

DTC Description

DTC DETECTION LOGIC

- Rationally incorrect voltage from the sensor is sent to ECM, compared with the voltage signals from ECT 1. sensor and intake air temperature sensor.
- The comparison result of signals transmitted to ECM from each temperature sensor (IAT sensor, ECT 2. sensor, EOT sensor, and FTT sensor) shows that the voltage signal of the FTT sensor is higher/lower than that of other temperature sensors when the engine is started with its cold state.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
			Diagnosis condition	_
			Signal (terminal)	Voltage signal transmitted from FTT sensor to ECM
	1	Threshold	Rationally incorrect voltage from the sensor is sent to ECM, compared with the voltage sig- nals from ECT sensor and intake air temper- ature sensor	
			Diagnosis delay time	-
P0181	FTT SENSOR		Diagnosis condition	—
PUIOI	(Fuel temperature sensor a circuit range/performance)		Signal (terminal)	Voltage signal transmitted from FTT sensor to ECM
		2	Threshold	The comparison result of signals transmitted 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 temperature sensors when the engine is started with its cold state
			Diagnosis delay time	—

POSSIBLE CAUSE

P0181 - 1 Harness or connectors (The FTT sensor circuit is open or shorted) FTT sensor L P0181 - 2 · Harness or connectors (The FTT sensor circuit is open or shorted) FTT sensor Μ FAIL-SAFE Not applicable Ν DTC CONFIRMATION PROCEDURE **1.INSPECTION START** Is it necessary to erase permanent DTC? YES >> GO TO 7. Ρ NO >> GO TO 2. 2.PRECONDITIONING

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

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

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< DTC/CIRCUIT DIAGNOSIS >

>> GO TO 3.

3. PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION 1-I

- 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-301. "Diagnosis Procedure".

NO >> GO TO 4.

4.CHECK ENGINE COOLANT TEMPERATURE

With CONSULT

- i. Select "COOLANT TEMP/S" in "DATA MONITOR" with CONSULT.
- 2. Check "COOLANT TEMP/S" value.

With GST

Follow the procedure "With CONSULT" above.

<u>"COOLANT TEMP/S" less than 60°C (140°F)?</u>

YES >> INSPECTION END

NO >> GO TO 5.

5. PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION 1-II

() With CONSULT

- 1. Cool engine down until "COOLANT TEMP/S" is less than 60°C (140°F).
- 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-301. "Diagnosis Procedure".
- NO >> GO TO 6.

6. CHECK FUEL TANK TEMPERATURE (FTT) SENSOR

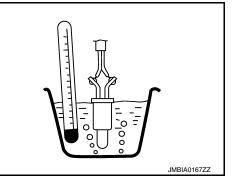
- 1. Turn ignition switch OFF.
- 2. Disconnect fuel level sensor unit and fuel pump harness connector.
- 3. Remove fuel level sensor unit. Refer to FL-5. "Removal and Installation".
- 4. Check resistance between fuel level sensor unit and fuel pump terminals by heating with hot water as shown in the figure.

Terminals	Condition		Resistance (k Ω)
1 and 3	Temperature [°C (°F)]	20 (68)	2.3 – 2.7
Tanu S		50 (122)	0.79 – 0.90

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to EC-301, "Diagnosis Procedure".



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.

	T DIAGNOS	SIS >			[VQ35DE]
>> GC) TO 8.				
B. PERFORM I	DTC CONFIF	RMATION PR	OCEDURE 2	2	
	ehicle to a co	ool place.			
NOTE:	hicle in an e	nvironment of	amhient air	temperature between –10°C	(14°E) and 35°C (95°E)
2. Turn ignitio	n switch OFF	and leave th			(14 T) and 55 C (95 T).
CAUTION:		itch ON duriı	a this proc	oduro	
NOTE:	-			euure.	
		bled with the h le for 5 minute			
CAUTION:					
Never turn Check 1st t		itch OFF dur	ing idling.		
s 1st trip DTC (•				
YES >> Pro	ceed to EC-	301, "Diagnos			
		nction sympton er repair: INS		air: Refer to <u>GI-41, "Intermitt</u>	ent Incident".
		еперан. шо			
iagnosis P	loceaure				INFOID:000000011939814
.INSPECTIO	N START				
onfirm the det	ected malfun	ction (A or B)	. Refer to EC	C-299, "DTC Description".	
Vhich malfunct	ion is detecte	ed?			
A >> GO) TO 2.				
D 00					
•) TO 5.				
CHECK FUE	TO 5. EL TANK TEN		SENSOR P	OWER SUPPLY	
2.CHECK FUE	TO 5. EL TANK TEN				
CHECK FUE . Turn ignitio . Disconnect . Turn ignitio) TO 5. EL TANK TEM n switch OFF tuel level se n switch ON.	- nsor unit and	fuel pump h	arness connector.	
CHECK FUE . Turn ignitio . Disconnect . Turn ignitio) TO 5. EL TANK TEM n switch OFF tuel level se n switch ON.	- nsor unit and	fuel pump h		ector and ground.
CHECK FUE . Turn ignitio . Disconnect . Turn ignitio) TO 5. EL TANK TEM n switch OFF tuel level se n switch ON.	- nsor unit and	fuel pump h	arness connector.	ector and ground.
CHECK FUE . Turn ignitio . Disconnect . Turn ignitio	TO 5. EL TANK TEM n switch OFF fuel level se n switch ON. voltage betwo	: nsor unit and een fuel level	fuel pump h	arness connector.	ector and ground.
CHECK FUE Turn ignitio Disconnect Turn ignitio Check the	TO 5. EL TANK TEM n switch OFF fuel level se n switch ON. voltage betwo	nsor unit and een fuel level	fuel pump h	arness connector. and fuel pump harness conne	ector and ground.
CHECK FUE Turn ignitio Disconnect Turn ignitio Check the Fuel level sensor) TO 5. EL TANK TEM n switch OFF fuel level se n switch ON. voltage betwo + r unit and fuel pr	nsor unit and een fuel level	fuel pump ha	arness connector. and fuel pump harness conne	ector and ground.
CHECK FUE Turn ignitio Disconnect Turn ignitio Check the Fuel level sensor Connector B42	TO 5. EL TANK TEM n switch OFF fuel level se n switch ON. voltage betwo + r unit and fuel pr Terminal 3	nsor unit and een fuel level ump - I Grou	fuel pump ha	arness connector. and fuel pump harness conne Voltage	ector and ground.
CHECK FUE Turn ignitio Disconnect Turn ignitio Check the Fuel level sensor Connector B42 the inspection YES >> GC	D TO 5. EL TANK TEM n switch OFF fuel level se n switch ON. voltage betwo + r unit and fuel pr Terminal 3 n result norm) TO 4.	nsor unit and een fuel level ump - I Grou	fuel pump ha	arness connector. and fuel pump harness conne Voltage	ector and ground.
CHECK FUE Turn ignitio Disconnect Turn ignitio Check the Fuel level sensor Connector B42 the inspection YES >> GC NO >> GC	TO 5. EL TANK TEM n switch OFF fuel level se n switch ON. voltage betwo + r unit and fuel pr Terminal 3 n result norm TO 4. TO 3.	nsor unit and een fuel level ump I Grou nal?	fuel pump ha	arness connector. and fuel pump harness conne Voltage pprox. 5 V	ector and ground.
CHECK FUE Turn ignitio Disconnect Turn ignitio Check the Fuel level sensor Connector B42 the inspection YES >> GC NO >> GC CHECK FUE	TO 5. EL TANK TEM n switch OFF fuel level se n switch ON. voltage betwo + r unit and fuel pr Terminal 3 n result norm TO 4. TO 3. EL TANK TEM	nsor unit and een fuel level ump Grou hal?	fuel pump ha	arness connector. and fuel pump harness conne Voltage	ector and ground.
CHECK FUE Turn ignitio Disconnect Turn ignitio Check the Fuel level sensor Connector B42 the inspection YES >> GC NO >> GC CHECK FUE Turn ignitio	TO 5. EL TANK TEM n switch OFF fuel level se n switch ON. voltage betwo + r unit and fuel pr Terminal 3 n result norm TO 4. TO 3. EL TANK TEM n switch OFF	nsor unit and een fuel level ump - Grou ual?	fuel pump ha	arness connector. and fuel pump harness conne Voltage pprox. 5 V	ector and ground.
CHECK FUE Turn ignitio Disconnect Turn ignitio Check the Fuel level sensor Connector B42 the inspection YES >> GC NO >> GC CHECK FUE Turn ignitio Disconnect	TO 5. EL TANK TEM n switch OFF fuel level se n switch ON. voltage betwo + r unit and fuel pu - r unit and fuel pu - Terminal 3 n result norm TO 4. TO 4. TO 3. EL TANK TEM n switch OFF ECM harnes	nsor unit and een fuel level ump - Grou all? MPERATURE	fuel pump has sensor unit a	arness connector. and fuel pump harness conne Voltage pprox. 5 V	
CHECK FUE Turn ignitio Disconnect Turn ignitio Check the Fuel level sensor Connector B42 the inspection YES >> GC NO >> GC CHECK FUE Turn ignitio Disconnect	TO 5. EL TANK TEM n switch OFF fuel level se n switch ON. voltage betwo + r unit and fuel pu - r unit and fuel pu - Terminal 3 n result norm TO 4. TO 4. TO 3. EL TANK TEM n switch OFF ECM harnes	nsor unit and een fuel level ump - Grou all? MPERATURE	fuel pump has sensor unit a	arness connector. and fuel pump harness conne Voltage pprox. 5 V	
CHECK FUE Turn ignitio Disconnect Turn ignitio Check the Fuel level sensor Connector B42 Sthe inspection YES >> GC NO >> GC CHECK FUE CHECK FUE Turn ignitio Disconnect Check the o tor.	TO 5. EL TANK TEM n switch OFF fuel level se n switch ON. voltage betwo + r unit and fuel pu Terminal 3 n result norm TO 4. TO 4. TO 3. EL TANK TEM n switch OFF ECM harnes continuity bet	nsor unit and een fuel level ump - Grou all? MPERATURE	fuel pump has sensor unit a	arness connector. and fuel pump harness conne Voltage pprox. 5 V	
CHECK FUE Turn ignitio Disconnect Turn ignitio Check the v Fuel level sensor Connector B42 Sthe inspection YES >> GC NO >> GC CHECK FUE CHECK FUE Check the v	TO 5. EL TANK TEM n switch OFF fuel level se n switch ON. voltage betwo + r unit and fuel pu Terminal 3 n result norm TO 4. TO 4. TO 3. EL TANK TEM n switch OFF ECM harnes continuity bef	nsor unit and een fuel level ump Grou al? MPERATURE	fuel pump has sensor unit a	arness connector. and fuel pump harness conne Voltage pprox. 5 V	
2.CHECK FUE 1. Turn ignitio 2. Disconnect 3. Turn ignitio 4. Check the v Fuel level sensor Connector B42 s the inspection YES >> GC NO >> GC 3. CHECK FUE 1. Turn ignitio 2. Disconnect 3. Check the v tor. Fuel level sensor	TO 5. EL TANK TEM n switch OFF fuel level se n switch ON. voltage betwo + r unit and fuel pu Terminal 3 n result norm TO 4. TO 4. TO 3. EL TANK TEM n switch OFF ECM harnes continuity bef	nsor unit and een fuel level ump Grou al? MPERATURE	fuel pump hasensor unit a	arness connector. and fuel pump harness conne Voltage pprox. 5 V OWER SUPPLY CIRCUIT	

YES >> Perform the trouble diagnosis for power supply circuit. >> Repair or replace error-detected parts.

NO

< DTC/CIRCUIT DIAGNOSIS >

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	unit and fuel pump	EC	Continuity	
Connector	onnector Terminal		Terminal	Continuity
B42	1	E10	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 connector.

5. CHECK FUEL TANK TEMPERATURE SENSOR

Check fuel tank temperature sensor. Refer to EC-302, "Component Inspection".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace fuel level sensor unit and fuel pump. Refer to <u>FL-5, "Removal and Installation"</u>.

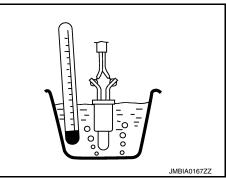
Component Inspection

INFOID:000000011939815

1.CHECK FUEL TANK TEMPERATURE SENSOR

- 1. Turn ignition switch OFF.
- 2. Remove fuel level sensor unit. Refer to <u>FL-5</u>, "Removal and Installation".
- Check resistance between "fuel level sensor unit and fuel pump" terminals by heating with hot water as shown in the figure.

Mass air flow sensor + –			Resistance (k Ω)		
		Condition			
Tern	ninals				
3	1	Temperature [°C (°F)]	20 (68)	2.3 - 2.7 kΩ	
5	I		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-5, "Removal and Installation"</u>.

P0182, P0183 FTT SENSOR

DTC Description

DTC DETECTION LOGIC

• An excessively low voltage from the sensor is sent to ECM.

• An excessively high voltage from the sensor is sent to ECM.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
		Diagnosis condition	Ignition switch ON	
D0192	FTT_SEN/CIRCUIT	Signal (terminal)	Voltage signal transmitted from fuel tank tem- perature sensor to ECM	
P0182 (Fuel temperature sensor "A" circuit low)	Threshold	An excessively low voltage from the sensor is sent to ECM		
		Diagnosis delay time	—	
		Diagnosis condition	Ignition switch ON	
D0402	FTT_SEN/CIRCUIT	Signal (terminal)	Voltage signal transmitted from fuel tank tem- perature sensor to ECM	
P0183 (Fuel temperature sensor "A" high)	(Fuel temperature sensor "A" circuit high)	Threshold	An excessively high voltage from the sensor is sent to ECM	
		Diagnosis delay time	_	

P0182

- Harness or connectors (The sensor circuit is open or shorted.)
- Fuel tank temperature sensor

P0183

- Harness or connectors (The sensor circuit is open or shorted.)
- Fuel tank temperature sensor

FAIL-SAFE

Not applicable

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 5 seconds.
- 2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to EC-303. "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

1.CHECK FUEL TANK TEMPERATURE SENSOR POWER SUPPLY

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P0182, P0183 FTT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

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	_	Voltage
Connector	Terminal	*	
B42	3	Ground	Approx. 5 V

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2. CHECK FUEL TANK TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

- 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	unit and fuel pump	E	Continuity	
Connector	Terminal	Connector	Terminal	Continuity
B42	3	E10	128	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.

$\mathbf{3}.$ CHECK FUEL TANK TEMPERATURE SENSOR GROUND CIRCUIT

- 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	unit and fuel pump	E	Continuity	
Connector	Connector Terminal		Terminal	Continuity
B42	1	E10	148	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 FUEL TANK TEMPERATURE SENSOR

Check fuel tank temperature sensor. Refer to EC-304, "Component Inspection".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace "fuel level sensor unit and fuel pump". Refer to <u>FL-5, "Removal and Installation"</u>.

Component Inspection

INFOID:000000011939818

1.CHECK FUEL TANK TEMPERATURE SENSOR

1. Turn ignition switch OFF.

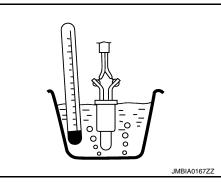
2. Remove fuel level sensor unit. Refer to FL-5. "Removal and Installation".

P0182, P0183 FTT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

3. Check resistance between "fuel level sensor unit and fuel pump" terminals by heating with hot water as shown in the figure.

Mass air f	low sensor				
+ –		Condition		Resistance (k Ω)	
Tern	ninals				
3	1	Temperature [°C (°F)]	20 (68)	2.3 - 2.7 kΩ	
5	I		50 (122)	0.79 - 0.90 kΩ	



[VQ35DE]

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Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace fuel level sensor unit and fuel pump. Refer to <u>FL-5</u>, "<u>Removal and Installation</u>".



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P0196 EOT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P0196 EOT SENSOR

DTC Description

INFOID:000000011939819

[VQ35DE]

DTC DETECTION LOGIC

- 1. Rationally incorrect voltage from the sensor is sent to ECM, compared with the voltage signals from EOT sensor and intake air temperature sensor.
- The comparison result of signals transmitted to ECM from each temperature sensor (IAT sensor, ECT 2. sensor, FTT sensor, and EOT sensor) shows that the signal voltage of the EOT sensor is higher/lower than that of other temperature sensors when the engine is started with its cold state.

DTC	CONSULT screen terms (Trouble diagnosis content)		DTC	C detection condition
			Diagnosis condition	-
			Signal (terminal)	Voltage signal transmitted from EOT sensor to ECM
		1	Threshold	Rationally incorrect voltage from the sensor is sent to ECM, compared with the voltage sig- nals from EOT sensor and intake air temper- ature sensor
			Diagnosis delay time	-
P0196	EOT SENSOR (Engine oil temperature sensor		Diagnosis condition	-
F0190	range/performance)		Signal (terminal)	Voltage signal transmitted from EOT sensor to ECM
		2	Threshold	The comparison result of signals transmitted 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 higher/lower than that of other temperature sensors when the engine is started with its cold state
			Diagnosis delay time	-

POSSIBLE CAUSE

P0196 - 1

- Harness or connectors (The EOT sensor circuit is open or shorted)
- · EOT sensor

P0196 - 2

- · Harness or connectors (High or low resistance in the EOT sensor circuit)
- · EOT sensor

FAIL-SAFE

Engine operating condition in fail-safe mode				
Fail safe mode Vehicle behavior				
Engine oil temperature sensor Intake valve timing control does not function.				

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0196 is displayed with another DTC P0197 or P0198, first perform the trouble diagnosis for DTC P0197 or P0198.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable.
 - DTC P0197: Refer to <u>EC-310</u>, "<u>DTC Description</u>".
 DTC P0198: Refer to <u>EC-310</u>, "<u>DTC Description</u>".
- NO >> GO TO 2.

< DTC/CIRCUIT DIAGNOSIS >

<u>Is it necessary to erase permanent DTC?</u> YES >> GO TO 7.		EC
NO >> GO TO 3.		
3. PRECONDITIONING		
If DTC CONFIRMATION PROCEDURE has been previdure before conducting the next test. 1. Turn ignition switch OFF and wait at least 10 second		С
 Turn ignition switch ON. Turn ignition switch OFF and wait at least 10 secon 	ds.	D
TESTING CONDITION:		
Before performing the following procedure, confirm	that battery voltage is 11 v or more at idle.	Е
>> GO TO 4.		
4. PERFORM DTC CONFIRMATION PROCEDURE FOR	DR MULFUNCTION 1-I	F
 Start engine and warm it up to normal operating ten Turn ignition switch OFF and wait at least 10 secon 		
 Turn ignition switch ON. Turn ignition switch OFF and wait at least 10 secon 	de	G
5. Start engine and let it idle for 5 minutes and 10 sec		
 Check 1st trip DTC. Is 1st trip DTC detected? 		Н
YES >> Proceed to EC-308, "Diagnosis Procedure" NO >> GO TO 5.		
5.PERFORM DTC CONFIRMATION PROCEDURE FO	DR MULTION 1-II	I
(P)With CONSULT		
 Select "DATA MONITOR" mode with CONSULT. Check that "COOLANT TEMP/S" indicates above 6 If it is above 60°C (140°F), go to the following steps 		J
	OOLANT TEMP/S" indicates more than 60°C (140°F).	Κ
4. Turn ignition switch ON.		L
NOTE: Do not turn ignition switch OFF until step 8.		
5. Select "DATA MONITOR" mode with CONSULT.		M
6. Check the following.		IVI
COOLANT TEMP/S	Below 40°C (104°F)	
INT/A TEMP SE	Below 40°C (104°F)	Ν
Difference between "COOLANT TEMP/S" and "INT/A TEMP SE"	Within 6°C (11°F)	
If they are within the specified range, perform the for If they are out of the specified range, soak the vehic lowing steps. NOTE:	blowing steps. Se to meet the above conditions. Then perform the fol-	0
 NOTE: Do not turn ignition switch OFF. 		Ρ
 If it is supposed to need a long period of time, 	do not deplete the battery.	
 Start engine and let it idle for 5 minutes. Check 1st trip DTC. 		
With GST		
Follow the procedure "With CONSULT" above. <u>Is 1st trip DTC detected?</u>		

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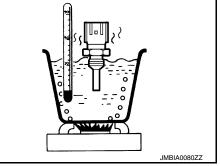
P0196 EOT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

6.CHECK ENGINE OIL TEMPERATURE (EOT) SENSOR

- 1. Turn ignition switch OFF.
- 2. Disconnect EOT sensor harness connector.
- 3. Remove EOT sensor. Refer to EC-15, "ENGINE CONTROL SYSTEM : Component Parts Location".
- 4. Check resistance between EOT sensor terminals by heating with hot water as shown in the figure.

Terminals	Condition	Resistance (k Ω)	
	Temperature [°C (°F)]	20 (68)	2.37 – 2.63
1 and 2		50 (122)	0.68 - 1.00
		90 (194)	0.236 - 0.260



Is the inspection result normal?

YES >> INSPECTION END NO >> Proceed to <u>EC-308, "Diagnosis Proc</u>edure".

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 2

1. 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). Turn ignition switch OFF and leave the vehicle for 12 hours.

 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. CAUTION:

Never turn ignition switch OFF during idling.

4. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to EC-308, "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

1.CHECK DTC PRIORITY

If DTC P0196 is displayed with another DTC P0197 or P0198, first perform the trouble diagnosis for DTC P0197 or P0198.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable.
 - DTC P0197: Refer to <u>EC-310, "DTC Description"</u>.

EC-308

INFOID:000000011939820

P0196 EOT SENSOR

			P0196 EOT S	ENSOR			
< DTC/CIR	CUIT DIAGNOSIS	>			[VQ35DE]		
	• DTC P0198: Refe	er to <u>EC-3</u>	10, "DTC Descrip	<u>tion"</u> .			
•	• GO TO 2.					А	
Z .CHECK	ENGINE OIL TEMP	ERATURI	E SENSOR				
Check engine oil temperature sensor. Refer to EC-309, "Component Inspection".							
Is the inspection result normal?							
	NSPECTION END						
NO >>	Replace engine oil nent Parts Location		ire sensor. Refer t	to <u>EC-15, "</u>	ENGINE CONTROL SYSTEM : Compo-	С	
Compon		<u>.</u>					
Compon	ent Inspection				INFOID:000000011939821	D	
1. CHECK	ENGINE OIL TEMP	ERATURI	E SENSOR			D	
1. Turn ig	nition switch OFF.						
2. Discon	nect engine oil temp					Е	
3. Remov	ve engine oil temper .ocation".	rature ser	isor. Refer to <u>EC</u>	<u>-15, "ENG</u>	INE CONTROL SYSTEM : Component		
	resistance between	engine oi	l temperature sen	sor termi-		_	
	heating with hot wa				H	F	
				-			
Terminals	Condition		Resistance (k Ω)	_		G	
		20 (68)	2.37 - 2.63	-			
1 and 2	Temperature [°C (°F)]	50 (122)	0.68 - 1.00	_			
		90 (194)	0.236 - 0.260	-		Н	
	ection result normal?	-					
	INSPECTION END Replace engine oil		ire sensor Refer	to EC-15	JMBIA0080ZZ		
	<u>"ENGINE CONTRO</u>				ion".		
						J	
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						Р	
						1	

P0197, P0198 EOT SENSOR

DTC Description

[VQ35DE]

INFOID:000000011939822

DTC DETECTION LOGIC

- An excessively low voltage from the sensor is sent to ECM.
- · An excessively high voltage from the sensor is sent to ECM.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
		Diagnosis condition	Start engine and let it idle	
D0107	EOT SEN/CIRC	Signal (terminal)	Voltage signal transmitted from engine oil temperature sensor to ECM	
P0197	(Engine oil temperature sensor circuit low)	Threshold	An excessively low voltage from the sensor is sent to ECM	
		Diagnosis delay time	—	
		Diagnosis condition	Start engine and let it idle	
D0109	EOT SEN/CIRC	Signal (terminal)	Voltage signal transmitted from engine oil temperature sensor to ECM	
P0198	(Engine oil temperature sensor circuit high)	Threshold	An excessively high voltage from the sensor is sent to ECM	
		Diagnosis delay time		

POSSIBLE CAUSE

P0197

- Harness or connectors (The sensor circuit is open or shorted.)
- Engine oil temperature sensor

P0198

- · Harness or connectors (The sensor circuit is open or shorted.)
- Engine oil temperature sensor

FAIL-SAFE

Engine operating condition in fail-safe mode				
Fail safe mode Vehicle behavior				
Engine oil temperature sensor	Intake valve timing control does not function.			

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 at least 5 seconds.
- 2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to EC-311, "Diagnosis Procedure".

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

P0197, P0198 EOT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

Diagnosis Procedure

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1. CHECK EOT SENSOR POWER SUPPLY

- 1. Disconnect engine oil temperature (EOT) sensor harness connector.
- 2. Turn ignition switch ON.
- 3. Check the voltage between EOT sensor harness connector and ground.

	+		
EOT	sensor	-	Voltage
Connector	Terminal		
F68	1	Ground	Approx. 5 V

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 EOT SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

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

•	EOT sensor		ECM		Continuity
-	Connector	Terminal	Connector Terminal		Continuity
	F68	2	F13	15	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 engine oil temperature sensor

Check engine oil temperature sensor. Refer to EC-311, "Component Inspection".

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Replace engine oil temperature sensor. Refer to <u>EC-15. "ENGINE CONTROL SYSTEM : Compo-</u> nent Parts Location".

Component Inspection

1.CHECK ENGINE OIL TEMPERATURE SENSOR

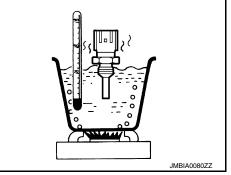
- 1. Turn ignition switch OFF.
- 2. Disconnect engine oil temperature sensor harness connector.
- 3. Remove engine oil temperature sensor. Refer to <u>EC-15, "ENGINE CONTROL SYSTEM : Component</u> <u>N</u> <u>Parts Location"</u>.
- 4. Check resistance between engine oil temperature sensor terminals by heating with hot water as shown in the figure.

Terminals	Condition	Resistance (k Ω)	
1 and 2	Temperature [°C (°F)]	20 (68)	2.37 - 2.63
		50 (122)	0.68 - 1.00
		90 (194)	0.236 - 0.260

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace engine oil temperature sensor. Refer to <u>EC-15</u>, <u>"ENGINE CONTROL SYSTEM : Component Parts Location"</u>.





P0222, P0223 TP SENSOR

DTC Description

[VQ35DE]

DTC DETECTION LOGICAn excessively low voltage from the TP sensor 1 is sent to ECM.

· An excessively high voltage from the TP sensor 1 is sent to ECM.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
		Diagnosis condition	Start engine and let it idle	
P0222	TP SEN 1/CIRC-B1 (Throttle/Pedal position sensor/switch	Signal (terminal)	Voltage signal transmitted from TP sensor 1 to ECM	
P0222	("B" circuit low)	Threshold	An excessively low voltage from the TP sen- sor 1 is sent to ECM	
		Diagnosis delay time	-	
		Diagnosis condition	Start engine and let it idle	
D0000	TP SEN 1/CIRC-B1 (Throttle/Pedal position sensor/switch "B" circuit high)	Signal (terminal)	Voltage signal transmitted from TP sensor 1 to ECM	
P0223		Threshold	An excessively high voltage from the TP sen- sor 1 is sent to ECM	
		Diagnosis delay time	-	

POSSIBLE CAUSE

P0222

- Harness or connectors (TP sensor 1 circuit is open or shorted.)
- Electric throttle control actuator (TP sensor 1)

P0223

- Harness or connectors (TP sensor 1 circuit is open or shorted.)
- Electric throttle control actuator (TP sensor 1)

FAIL-SAFE

Engine operating condition in fail-safe mode				
Fail safe mode Vehicle behavior				
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.			

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0222 or P0223 is displayed with another DTC P0643, first perform the trouble diagnosis for DTC P0643.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to EC-424, "DTC Description".

NO >> GO TO 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:

P0222, P0223 TP SENSOR

		P022	Z, PUZZ	13 IP 3	ENSUR	
< DTC/CIRCU	IT DIAGNOSI	S >				[VQ35DE]
Before perfor	ming the follo	wing procedu	ure, confi	rm that b	pattery voltage is mor	e than 10 V at idle.
>> G(D TO 3.					
^	DTC CONFIRM	MATION PRO	CEDURE			
	ne and let it idle	for 1 second.				
2. Check DT s DTC detecte	-					
	oceed to <u>EC-31</u>	13 "Diagnosis	Procedu	re"		
NO-1 >> To	check malfund	tion symptom	before re	pair: Ref	er to <u>GI-41, "Intermitter</u>	<u>nt Incident"</u> .
	onfirmation afte	r repair: INSP	ECTIONE	END		
Diagnosis F	rocedure					INFOID:000000011939826
1.CHECK DT	C PRIORITY					
	or P0223 is d	splayed with	another D	DTC P06	43, first perform the tr	ouble diagnosis for DTC
P0643. Is applicable D	TC detected?					
• •		s of applicable	e. Refer to	• <u>EC</u> -424	"DTC Description".	
NO >> G(O TO 2.					
2. CHECK TH	ROTTLE POSI	TION SENSC	R 1 POW	ER SUP	PLY	
	t electric throttl	e control actu	ator harne	ess conne	ector.	
•	on switch ON. voltage betwee	en electric thro	ottle contro	ol actuato	or harness connector a	nd ground.
	_					
	+					
	e control actuator		Vo	oltage		
Connector F57	Terminal 5	Ground	Ann	rox. 5 V		
-	on result norma					
YES >> GO	O TO 4.					
•						
	ROTTLE POSI	HON SENSO	R 1 POW	ER SUP		
	on switch OFF. t ECM harness	connector.				
			hrottle cor	ntrol actu	ator and ECM harness	connector.
Electric throttl	e control actuator		ECM			
Connector	Terminal	Connector		erminal	Continuity	
F57	5	F14		98	Existed	
-	on result norma				<u> </u>	
YES >> IN	SPECTION EN	D	_			
4	epair or replace		•			
	ROTTLE POSI	HON SENSO	OR 1 GRO	UND CIF	CUIT	
2. Disconnec	on switch OFF. It ECM harness continuity betw		hrottle cor	ntrol actu	ator and ECM harness	connector.
Electric throttle	control actuator	ECM	Λ			
Connector	Terminal	Connector	Terminal	Continu	ity	
		= 1 1		- • •		

Revision: October 2015

4

F57

Existed

75

F14

P0222, P0223 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

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

Is the inspection result normal?

YES >> GO TO 5.

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

5.CHECK THROTTLE POSITION SENSOR 1 INPUT SIGNAL CIRCUIT

1. Check the continuity between electric throttle control actuator and ECM harness connector.

Electric throttle	control actuator	E	СМ	Continuity
Connector	Terminal	Connector	Terminal	Continuity
F57	6	F14	71	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 THROTTLE POSITION SENSOR

Check throttle position sensor. Refer to EC-314, "Component Inspection".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace electric throttle control actuator. Refer to <u>EM-27, "Removal and Installation"</u>.

Component Inspection

INFOID:0000000011939827

1.CHECK THROTTLE POSITION SENSOR

- 1. Turn ignition switch OFF.
- 2. Reconnect all harness connectors disconnected.

3. Perform Throttle Valve Closed Position Learning. Refer to <u>EC-159, "Description"</u>.

- 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.

	ECM				
Connector	+	-	Condit	ion	Voltage
Connector	Terminal	Terminal			
	71			Fully released	More than 0.36 V
F14	71	75	Accelerator pedal	Fully depressed	Less than 4.75 V
F 14	72	75	Accelerator pedar	Fully released	Less than 4.75 V
	12			Fully depressed	More than 0.36 V

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace electric throttle control actuator. Refer to EM-27, "Removal and Installation".

< DTC/CIRCUIT DIAGNOSIS >

P0300, P0301, P0302, P0303, P0304, P0305, P0306 MISFIRE

DTC Description

INFOID:000000011939828

[VQ35DE1

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	0
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) 2. 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	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition	
		Diagnosis condition	—	
P0300	MULTI CYL MISFIRE	Signal (terminal)	—	J
P0300	(Random/Multiple cylinder misfire de- tected)	Threshold	Multiple cylinders misfire	
		Diagnosis delay time		
		Diagnosis condition	-	K
P0301	CYL 1 MISFIRE	Signal (terminal)		
P0301	(Cylinder 1 misfire detected)	Threshold	No. 1 cylinder misfires	L
		Diagnosis delay time		
		Diagnosis condition	—	
P0302	CYL 2 MISFIRE	Signal (terminal)		N
P0302	(Cylinder 2 misfire detected)	Threshold	No. 2 cylinder misfires	
		Diagnosis delay time	—	N
		Diagnosis condition	—	
P0303	CYL 3 MISFIRE	Signal (terminal)	-	
P0303	(Cylinder 3 misfire detected)	Threshold	No. 3 cylinder misfires	С
		Diagnosis delay time	—	
		Diagnosis condition	-	
P0304	CYL 4 MISFIRE	Signal (terminal)	-	P
FU3U4	(Cylinder 4 misfire detected)	Threshold	No. 4 cylinder misfires	
		Diagnosis delay time	_	

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< DTC/CIRCUIT DIAGNOSIS >

		Diagnosis condition	—
P0305	CYL 5 MISFIRE	Signal (terminal)	—
F0303	(Cylinder 5 misfire detected)	Threshold	No. 5 cylinder misfires
		Diagnosis delay time	_
		Diagnosis condition	—
P0306	CYL 6 MISFIRE	Signal (terminal)	—
F0300	(Cylinder 6 misfire detected)	Threshold	No. 6 cylinder misfires
		Diagnosis delay time	—

POSSIBLE CAUSE

P0300

- Improper spark plug
- Insufficient compression
- Incorrect fuel pressure
- The fuel injector circuit is open or shorted
- Fuel injector
- Intake air leakage
- · The ignition signal circuit is open or shorted
- Lack of fuel
- · Signal plate
- A/F sensor 1
- Incorrect PCV hose connection

P0301

- · Improper spark plug
- Insufficient compression
- Incorrect fuel pressure
- · The fuel injector circuit is open or shorted
- Fuel injector
- · Intake air leakage
- The ignition signal circuit is open or shorted
- Lack of fuel
- Signal plate
- A/F sensor 1
- Incorrect PCV hose connection

P0302

- · Improper spark plug
- Insufficient compression
- Incorrect fuel pressure
- · The fuel injector circuit is open or shorted
- Fuel injector
- Intake air leakage
- The ignition signal circuit is open or shorted
- Lack of fuel
- Signal plate
- A/F sensor 1
- Incorrect PCV hose connection

P0303

- · Improper spark plug
- Insufficient compression
- Incorrect fuel pressure
- The fuel injector circuit is open or shorted
- Fuel injector
- Intake air leakage
- The ignition signal circuit is open or shorted
- Lack of fuel
- Signal plate

DO200 DO204 DO202 DO202 DO204 DO205 DO206 MISSIDE

AF sensor 1 Incorrect PCV hose connection AF Sensor 1 Incorrect PCV hose connection Improper spark plug Insufficient compression Incorrect help pressure The fuel injector circuit is open or shorted Incorrect PCV hose connection C Signal plate Signal pl	FU300, FU301, FU302, FU303, FU304, FU305, FU306 MISFIRE		
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P0306 Improper spark plug Insufficient compression Incorrect fuel pressure The fuel injector circuit is open or shorted Fuel injector Intake air leakage The ignition signal circuit is open or shorted Lack of fuel Signal plate A/F sensor 1 Incorrect PCV hose connection FAIL-SAFE Not applicable DTC CONFIRMATION PROCEDURE I.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. SGO TO 2. P	A/F sensor 1		Н
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 Incorrect PCV hose connection FAIL-SAFE Not applicable DTC CONFIRMATION PROCEDURE PRECONDITIONING If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test. Turn ignition switch OFF and wait at least 10 seconds. Turn ignition switch OFF and wait at least 10 seconds. S GO TO 2. 	Signal plate		
FAIL-SAFE Not applicable 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 OFF and wait at least 10 seconds. > GO TO 2.			
Not applicable 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 OFF and wait at least 10 seconds. 3. Turn ignition switch OFF and wait at least 10 seconds. >> GO TO 2.			L
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.	Not applicable		
If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test. N 1. Turn ignition switch OFF and wait at least 10 seconds. O 2. Turn ignition switch ON. O 3. Turn ignition switch OFF and wait at least 10 seconds. O >> GO TO 2. P	DTC CONFIRMATION PROCEDURE		M
 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. 	1.preconditioning		
 Turn ignition switch OFF and wait at least 10 seconds. Turn ignition switch ON. Turn ignition switch OFF and wait at least 10 seconds. > GO TO 2. 		g procedure	Ν
 Turn ignition switch ON. Turn ignition switch OFF and wait at least 10 seconds. >> GO TO 2. 			
 Turn ignition switch OFF and wait at least 10 seconds. >> GO TO 2. 			\cap
	3. Turn ignition switch OFF and wait at least 10 seconds.		0
	>> GO TO 2.		P
	2.PERFORM DTC CONFIRMATION PROCEDURE-I		1
 Start engine and warm it up to normal operating temperature. 	1. Start engine and warm it up to normal operating temperature.		
0			

- Restart engine and let it idle for approximately 15 minutes.
 Check 1st trip DTC.

< DTC/CIRCUIT DIAGNOSIS >

Is 1st trip DTC detected?

YES >> Proceed to EC-318, "Diagnosis Procedure".

NO >> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE-II

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Turn ignition switch OFF and wait at least 10 seconds.
- 4. Start engine and drive the vehicle under similar conditions to (1st trip) Freeze Frame Data for a certain time. Refer to the table below.

Hold the accelerator pedal as steady as possible.

Similar conditions to (1st trip) Freeze Frame Data mean that the following conditions should be satisfied at the same time.

CAUTION:

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

Engine speed	Engine speed in the freeze frame data \pm 400 rpm
Vehicle speed	Vehicle speed in the freeze frame data \pm 10 km/h (6 MPH)
Basic fuel schedule	Basic fuel schedule in freeze frame data \times (1 \pm 0.1)
Engine coolant temperature (T)	When the freeze frame data shows lower than 70°C (158°F), T should be lower than 70°C (158°F).
condition	When the freeze frame data shows higher than or equal to 70°C (158°F), T should be higher than or equal to 70°C (158°F).

Driving time varies according to the engine speed in the freeze frame data.

Engine speed	Time
Around 1,000 rpm	Approximately 10 minutes
Around 2,000 rpm	Approximately 5 minutes
More than 3,000 rpm	Approximately 3.5 minutes

5. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to EC-318, "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:0000000011939829

[VQ35DE]

1. 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 2.

2.CHECK FOR EXHAUST SYSTEM CLOGGING

Stop engine and visually check exhaust tube, three way catalyst and muffler for dents.

Is the inspection result normal?

YES-1 >> With CONSULT: GO TO 3.

YES-2 >> Without CONSULT: GO TO 4.

NO >> Repair or replace malfunctioning part.

3.PERFORM POWER BALANCE TEST

With CONSULT

< DTC/CIRCUIT DIAGNOSIS >

- 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 9.

NO >> GO TO 4.

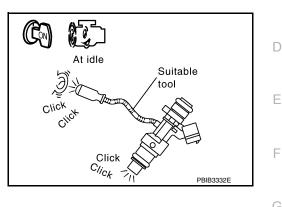
4.CHECK FUNCTION OF FUEL INJECTOR

- 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 5.
- NO >> Perform trouble diagnosis for FUEL INJECTOR, refer to <u>EC-550, "Diagnosis Procedure"</u>.



5. CHECK FUNCTION OF IGNITION COIL-I

CAUTION:

Perform the following procedure in a place with no combustible objects and good ventilation.

- 1. Turn ignition switch OFF.
- 2. Remove fuel pump fuse 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:

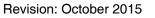
When the gap is less than 13 mm (0.52 in), a spark might be generated even if the coil is malfunc- P tioning.

Is the inspection result normal?

YES >> GO TO 9. NO >> GO TO 6.

O.CHECK FUNCTION OF IGNITION COIL-II

1. Turn ignition switch OFF.



13 - 17 mm

(0.52-0.66 in)

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(Cylinder head, cylinder block, etc.)

Grounded metal portion

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< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

- 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 7.

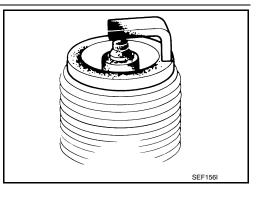
NO >> Check ignition coil, power transistor and their circuits. Refer to EC-555, "Diagnosis Procedure".

7.CHECK SPARK PLUG

Check the initial spark plug for fouling, etc.

Is the inspection result normal?

- YES >> Replace spark plug(s) with standard type one(s). For spark plug type, refer to <u>EM-140, "Spark Plug"</u>.
- NO >> Repair or clean spark plug. Then GO TO 8.



8. CHECK FUNCTION OF IGNITION COIL-III

- 1. Reconnect the initial spark plugs.
- 2. Crank engine for approximately 3 seconds, and recheck whether spark is generated between the spark plug and the grounded portion.

Spark should be generated.

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Replace spark plug(s) with standard type one(s). For spark plug type, refer to <u>EM-140, "Spark</u> <u>Plug"</u>.

9. CHECK COMPRESSION PRESSURE

Check compression pressure. Refer to EM-24, "On-Vehicle Service".

Is the inspection result normal?

YES >> GO TO 10.

NO >> Check pistons, piston rings, valves, valve seats and cylinder head gaskets.

10.CHECK FUEL PRESSURE

1. Install all removed parts.

- 2. Release fuel pressure to zero. Refer to EC-168, "Work Procedure".
- 3. Install fuel pressure gauge kit [SST: (J-44321)] and check fuel pressure. Refer to <u>EC-168, "Work Proce-</u> <u>dure"</u>.

At idle: Approximately 350 kPa (3.5 bar, 3.57 kg/cm², 51 psi)

Is the inspection result normal?

YES >> GO TO 12.

NO >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check fuel hoses and fuel tubes for clogging.

Is the inspection result normal?

- YES >> Replace "fuel filter and fuel pump assembly". Refer to <u>FL-5, "Removal and Installation"</u>.
- NO >> Repair or replace malfunctioning part.

12. CHECK IGNITION TIMING

< DTC/CIRCUIT DIAGNOSIS >

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Check idle speed and ignition timing.	
For procedure, refer to EC-164, "Work Procedure".	
For specification, refer to EC-587, "Idle Speed" and EC-587, "Ignition Timing".	
Is the inspection result normal?	
YES >> GO TO 13.	
NO >> Follow the <u>EC-164, "Work Procedure"</u> .	
13. 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		EC	CM	Continuity
	Bank	Connector	Terminal	Connector	Terminal	Continuity
	1	F12	3		66	
	I	1 12	4	F14	67	Existed
	2	F61	3	1 14	76	LAISIEU
	Z	FUI	4		77	

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	F12	3		
I	1 12	4	Ground	Not existed
2	F61	3	Ground	NUL EXISIEU
2	FUI	4		

EC	CM	Ground	Continuity
Connector	Terminal	Cround	Continuity
	66		
E14	67	Ground	Not existed
F14	76	Ground	NOL EXISLED
	77		

6. Also check harness for short to power.

 Is the inspection result normal?

 YES
 >> GO TO 14.

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

 14.CHECK A/F SENSOR 1 HEATER

 Check A/F sensor 1 heater. Refer to EC-209, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 15.

NO >> Replace malfunctioning A/F sensor 1. Refer to <u>EM-36, "Removal and Installation (bank 2)", EM-</u> 37, "Removal and Installation (bank 1)".

15. CHECK MASS AIR FLOW SENSOR

With CONSULT

1. Check "MASS AIR FLOW" in "DATA MONITOR" mode with CONSULT.

2. For specification, refer to EC-587, "Mass Air Flow Sensor".

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

- 1. Check mass air flow sensor signal in Service \$01 with GST.
- 2. For specification, refer to EC-587, "Mass Air Flow Sensor".

Is the measurement value within the specification?

```
YES >> GO TO 16.
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NO >> Check connectors for rusted terminals or loose connections in the mass air flow sensor circuit or ground. Refer to <u>EC-227. "Diagnosis Procedure"</u>.

16.CHECK SYMPTOM TABLE

Check items on the rough idle symptom in EC-575. "Symptom Table".

Is the inspection result normal?

YES >> GO TO 17.

NO >> Repair or replace malfunctioning part.

17.ERASE THE 1ST TRIP DTC

Some tests may cause a 1st trip DTC to be set. Erase the 1st trip DTC from the ECM memory after performing the tests. Refer to <u>EC-73</u>, <u>"CONSULT Func-tion"</u>.

>> INSPECTION END

< DTC/CIRCUIT DIAGNOSIS >

P0327, P0328, P0332, P0333 KS

DTC Description

DTC DETECTION LOGIC

• An excessively low voltage from the sensor is sent to ECM.

• An excessively high voltage from the sensor is sent to ECM.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition				
P0327		Diagnosis condition	Start engine and let it idle			
	KNOCK SEN/CIRC-B1 (Knock sensor 1 circuit low bank 1)	Signal (terminal)	Voltage signal transmitted from knock sensor to ECM			
		Threshold	An excessively low voltage from the sensor is sent to ECM			
		Diagnosis delay time	—			
P0328	KNOCK SEN/CIRC-B1 (Knock sensor 1 circuit high bank 1)	Diagnosis condition	Start engine and let it idle			
		Signal (terminal)	Voltage signal transmitted from mass air flow sensor to ECM			
		Threshold	An excessively high voltage from the sensor is sent to ECM.			
		Diagnosis delay time	-			
P0332	KNOCK SEN/CIRC-B2 (Knock sensor 2 circuit low bank 2)	Diagnosis condition	Start engine and let it idle			
		Signal (terminal)	Voltage signal transmitted from knock sensor to ECM			
		Threshold	An excessively low voltage from the sensor is sent to ECM			
		Diagnosis delay time	—			
P0333	KNOCK SEN/CIRC-B1 (Knock sensor 2 circuit high bank 2)	Diagnosis condition	Start engine and let it idle			
		Signal (terminal)	Voltage signal transmitted from mass air flow sensor to ECM			
		Threshold	An excessively high voltage from the sensor is sent to ECM.			
		Diagnosis delay time	—			

POSSIBLE CAUSE

P0327

Harness or connectors (The sensor circuit is open or shorted.)
 Knock sensor

P0328

• Harness or connectors (The sensor circuit is open or shorted.)

Knock sensor

P0332

- Harness or connectors (The sensor circuit is open or shorted.)
- Knock sensor

P0333

- Harness or connectors (The sensor circuit is open or shorted.)
- Knock sensor

FAIL-SAFE Not applicable

DTC CONFIRMATION PROCEDURE

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INFOID:000000011939830

P0327, P0328, P0332, P0333 KS

< DTC/CIRCUIT DIAGNOSIS >

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-324, "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:000000011939831

1. CHECK KNOCK SENSOR GROUND CIRCUIT

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			ECM		Continuity
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0327, P0328	1	F202	2	F13	4	Existed
P0332, P0333	2	F203	2	115		

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

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

DTC	Knock sensor			ECM		Continuity
DIC	Bank	Connector	Terminal	Connector	Terminal	Continuity
P0327, P0328	1	F202	1	F13	5	Existed
P0332, P0333	2	F203	1	113	9	LAISted

2. 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 KNOCK SENSOR

Check knock sensor. Refer to EC-325, "Component Inspection".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace malfunctioning knock sensor. Refer to <u>EM-115, "Exploded View"</u>.

P0327, P0328, P0332, P0333 KS

[VQ35DE] < DTC/CIRCUIT DIAGNOSIS > **Component Inspection** INFOID:000000011939832 А 1.CHECK KNOCK SENSOR 1. Turn ignition switch OFF. EC 2. Disconnect knock sensor harness connector. 3. Check resistance between knock sensor terminal as per the following. NOTE: It is necessary to use an ohmmeter which can measure more than 10 M $\!\Omega.$ Knock sensor D + Resistance -Terminals 2 Approx. 532 - 588 kΩ [at 20°C (68°F)] 1 Ε **CAUTION:** Never use any knock sensors that have been dropped or physically damaged. Use only new ones. Is the inspection result normal? F YES >> INSPECTION END NO >> Replace malfunctioning knock sensor. Refer to EM-115, "Exploded View". Н J

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< DTC/CIRCUIT DIAGNOSIS >

P0335 CKP SENSOR (POS)

DTC Description

INFOID:0000000011939833

[VQ35DE]

DTC DETECTION LOGIC

- 1. The crankshaft position sensor (POS) signal is not detected by the ECM during the first few seconds of engine cranking.
- 2. The proper pulse signal from the crankshaft position sensor (POS) is not sent to ECM while the engine is running.
- 3. The crankshaft position sensor (POS) signal is not in the normal pattern during engine running.

DTC	CONSULT screen terms (Trouble diagnosis content)		DTC	detection condition
			Diagnosis condition	Start engine and let it idle
			Signal (terminal)	Voltage signal transmitted from crankshaft position sensor (POS) to ECM
		1	Threshold	The crankshaft position sensor (POS) signal is not detected by the ECM during the first few seconds of engine cranking
			Diagnosis delay time	_
	CKP SEN/CIRCUIT P0335 (Crankshaft position sensor "A" cir- cuit)		Diagnosis condition	Start engine and let it idle
		2	Signal (terminal)	Voltage signal transmitted from crankshaft position sensor (POS) to ECM
P0335			Threshold	The proper pulse signal from the crankshaft position sensor (POS) is not sent to ECM while the engine is running
			Diagnosis delay time	_
			Diagnosis condition	Start engine and let it idle
		3	Signal (terminal)	Voltage signal transmitted from crankshaft position sensor (POS) to ECM
			Threshold	The crankshaft position sensor (POS) signal is not in the normal pattern during engine run- ning
			Diagnosis delay time	—

POSSIBLE CAUSE

- Harness or connectors [CKP sensor (POS) circuit is open or shorted.]
- Crankshaft position sensor (POS)
- Signal plate

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0335 is displayed with another DTC P0643, first perform the trouble diagnosis for DTC P0643. Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to <u>EC-424, "DTC Description"</u>.

NO >> GO TO 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.

Before performing the following procedure, confirm that battery voltage is more than 10.5 V with igni-А tion switch ON. >> GO TO 3. EC **3.** PERFORM DTC CONFIRMATION PROCEDURE 1. Start engine and let it idle for at least 5 seconds. If engine does not start, crank engine for at least 2 seconds. 2. Check 1st trip DTC. Is 1st trip DTC detected? D YES >> Proceed to EC-327, "Diagnosis Procedure". NO-1 >> To check malfunction symptom before repair: Refer to GI-41, "Intermittent Incident". NO-2 >> Confirmation after repair: INSPECTION END Ε Diagnosis Procedure INFOID:000000011939834 1. CHECK DTC PRIORITY If DTC P0335 is displayed with another DTC P0643, first perform the trouble diagnosis for DTC P0643. Is applicable DTC detected? YES >> Perform diagnosis of applicable. Refer to EC-424, "DTC Description". NO >> GO TO 2. **2.**CHECK CRANKSHAFT POSITION (CKP) SENSOR (POS) POWER SUPPLY Н 1. Disconnect crankshaft position (CKP) sensor (POS) harness connector. Turn ignition switch ON. 2. Check the voltage between CKP sensor (POS) harness connector and ground. 3. + CKP sensor (POS) Voltage (V) Connector Terminal F30 1 Ground Approx. 5 Κ Is the inspection result normal? YES >> GO TO 4. NO >> GO TO 3. $\mathbf{3}$.check crankshaft position (ckp) sensor (pos) power supply circuit L 1. Turn ignition switch OFF 2. Disconnect ECM harness connector. M Check the continuity between CKP sensor (POS) harness connector and ECM harness connector. 3. CKP sensor (POS) ECM Ν Continuity Connector Terminal Connector Terminal F30 1 F13 28 Existed Is the inspection result normal? YES >> INSPECTION END NO >> Repair or replace error-detected parts. Ρ ${f 4}$. CHECK CKP SENSOR (POS) GROUND CIRCUIT Turn ignition switch OFF. 1. 2. Disconnect ECM harness connector.

3. Check the continuity between CKP sensor (POS) harness connector and ECM harness connector.

< DTC/CIRCUIT DIAGNOSIS >

TESTING CONDITION:

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

CKP sen	sor (POS)	E	СМ	Continuity
Connector	Terminal	Connector	Terminal	Continuity
F30	2	F13	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, short to ground or short to power in harness or connectors.

 ${f 5.}$ CHECK CKP SENSOR (POS) INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between CKP sensor (POS) harness connector and ECM harness connector.

CKP sen	sor (POS)	E	СМ	Continuity
Connector	Terminal	Connector	Terminal	Continuity
F30	3	F13	36	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 CRANKSHAFT POSITION SENSOR (POS)

Check crankshaft position sensor (POS). Refer to EC-328, "Component Inspection".

Is the inspection result normal?

- YES >> GO TO 7.
- NO >> Replace crankshaft position sensor (POS). Refer to EM-115. "Exploded View".

7. CHECK GEAR TOOTH

Visually check for chipping signal plate gear tooth.

Is the inspection result normal?

YES >> INSPECTION END

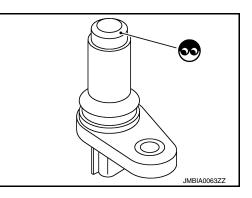
NO >> Replace the drive plate. Refer to <u>EM-116, "Disassembly and Assembly"</u>.

Component Inspection

INFOID:000000011939835

1.CHECK CRANKSHAFT POSITION SENSOR (POS)-I

- 1. Loosen the fixing bolt of the sensor.
- 2. Disconnect crankshaft position sensor (POS) harness connector.
- 3. Remove the sensor.
- 4. Visually check the sensor for chipping.
- Is the inspection result normal?
- YES >> GO TO 2.
- NO >> Replace crankshaft position sensor (POS). Refer to <u>EM-</u> <u>115, "Exploded View"</u>.



2.CHECK CRANKSHAFT POSITION SENSOR (POS)-II

Check the resistance between crankshaft position sensor (POS) terminals as per the following.

< DTC/CIRCUIT	F DIAGNOSIS >			[VQ35DE]	
Crankshaft posit	tion sensor (POS)				А
+	_	Resistance [at 25°C (77°F)]		-	
Terminal	l (Polarity)				EC
1	2				
	3	Except 0 or $\infty \Omega$			
2	3				С
Is the inspection					
YES >> INSI	PECTION END	position concer (DOC) Defer to EN	145 "Evaleded View"		D
NO >> Rep	nace crankshalt p	osition sensor (POS). Refer to EN	I-TTO, Exploded view.		D
					Ε
					F
					I
					G
					Н
					J
					Κ
					L
					Μ
					Ν
					0

P0340, P0345 CMP SENSOR (PHASE)

< DTC/CIRCUIT DIAGNOSIS >

P0340, P0345 CMP SENSOR (PHASE)

DTC Description

DTC DETECTION LOGIC

- 1. The cylinder No. signal is not sent to ECM for the first few seconds during engine cranking.
- 2. The cylinder No. signal is not sent to ECM during engine running.
- 3. The cylinder No. signal is not in the normal pattern during engine running.

DTC	CONSULT screen terms (Trouble diagnosis content)		DTC	C detection condition
			Diagnosis condition	 Start engine and let it idle Start engine and maintaining engine speed at more than 800 rpm
		1	Signal (terminal)	Voltage signal transmitted from Camshaft po- sition sensor (PHASE) to ECM
			Threshold	The cylinder No. signal is not sent to ECM for the first few seconds during engine cranking
			Diagnosis delay time	-
			Diagnosis condition	 Start engine and let it idle Start engine and maintaining engine speed at more than 800 rpm
P0340	CMP SEN/CIRC-B1 (Camshaft position sensor "A" cir- cuit bank 1)	2	Signal (terminal)	Voltage signal transmitted from Camshaft po- sition sensor (PHASE) to ECM
			Threshold	The cylinder No. signal is not sent to ECM during engine running
			Diagnosis delay time	_
			Diagnosis condition	 Start engine and let it idle Start engine and maintaining engine speed at more than 800 rpm
		3	Signal (terminal)	Voltage signal transmitted from Camshaft po- sition sensor (PHASE) to ECM
			Threshold	The cylinder No. signal is not in the normal pattern during engine running
			Diagnosis delay time	_

INFOID:000000011939836

P0340, P0345 CMP SENSOR (PHASE)

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

	1	Signal (terminal) Threshold	Voltage signal transmitted from Camshaft po- sition sensor (PHASE) to ECM The cylinder No. signal is not sent to ECM for	EC
		Threshold		
			the first few seconds during engine cranking	
		Diagnosis delay time	-	С
		Diagnosis condition	 Start engine and let it idle Start engine and maintaining engine speed at more than 800 rpm 	D
/IP SEN/CIRC-B2 amshaft position sensor "A" cir-	2	Signal (terminal)	Voltage signal transmitted from Camshaft po- sition sensor (PHASE) to ECM	
it bank 2)		Threshold	The cylinder No. signal is not sent to ECM during engine running	Ε
		Diagnosis delay time	-	
		Diagnosis condition	 Start engine and let it idle Start engine and maintaining engine speed at more than 800 rpm 	F
		Signal (terminal)	Voltage signal transmitted from Camshaft po- sition sensor (PHASE) to ECM	G
		Threshold	The cylinder No. signal is not in the normal pattern during engine running	Н
		Diagnosis delay time	-	11
aı		mshaft position sensor "A" cir- bank 2)	mshaft position sensor "A" cirbank 2) 2 Signal (terminal) Threshold Diagnosis delay time Diagnosis condition 3 Signal (terminal) Threshold	P SEN/CIRC-B2 mshaft position sensor "A" cir- bank 2) 2 3 Signal (terminal) 2 Voltage signal transmitted from Camshaft po- sition sensor (PHASE) to ECM Threshold Threshold Diagnosis delay time - Diagnosis condition 3 Signal (terminal) Voltage signal transmitted from Camshaft po- sition sensor (PHASE) to ECM Voltage signal transmitted from Camshaft po- sition sensor (PHASE) to ECM Threshold Diagnosis delay time - Start engine and let it idle Start engine and maintaining engine speed at more than 800 rpm Signal (terminal) Voltage signal transmitted from Camshaft po- sition sensor (PHASE) to ECM Threshold

POSSIBLE CAUSE

P0340Harness or connectors

- CMP sensor (PHASE) circuit is open or shorted.	
- APP sensor 2 circuit is shorted.	J
 Battery current sensor circuit is shorted. 	
- EOP sensor circuit is shorted.	
 Refrigerant pressure sensor is shorted. 	K
Camshaft position sensor (PHASE)	
Camshaft (INT)	
 Starter motor (Refer to <u>STR-5, "System Diagram"</u>.) 	1
 Starting system circuit (Refer to <u>STR-5, "System Diagram"</u>.) 	
Dead (Weak) battery	
 Accelerator pedal position sensor (APP sensor 2) 	
Battery current sensor	M
Engine oil pressure sensor	
Refrigerant pressure sensor	
P0345	Ν
Harness or connectors	

- CMP sensor (PHASE) circuit is open or shorted.
- APP sensor 2 circuit is shorted.
- Battery current sensor circuit is shorted.
- EOP sensor circuit is shorted.
- Refrigerant pressure sensor is shorted.
- Camshaft position sensor (PHASE)
- Camshaft (INT)
- Starter motor (Refer to <u>STR-5, "System Diagram"</u>.)
- Starting system circuit (Refer to <u>STR-5, "System Diagram"</u>.)
- Dead (Weak) battery
- Accelerator pedal position sensor (APP sensor 2)
- Battery current sensor
- Engine oil pressure sensor

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< DTC/CIRCUIT DIAGNOSIS >

Refrigerant pressure sensor

FAIL-SAFE Not applicable

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-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.

<u>Is 1st trip DTC detected?</u>

- YES >> Proceed to EC-332, "Diagnosis Procedure".
- NO >> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE-I

- 1. Maintaining engine speed at more than 800 rpm for at least 5 seconds.
- 2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to EC-332, "Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-41, "Intermittent Incident"</u>.
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000011939837

1.CHECK STARTING SYSTEM

Turn ignition switch to START position.

Does the engine turn over? Does the starter motor operate?

- YES >> GO TO 2.
- NO >> Check starting system. (Refer to <u>STR-10, "Work Flow (With GR8-1200 NI)"</u> or <u>STR-14, "Work Flow (Without GR8-1200 NI)"</u>.)

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.

	CM	P sensor (PH	ASE)			
DTC	Bank	Connector	+	-	Voltage (V)	
	Dank		Terminal			
P0340	1	F55	1	Ground	Approx. 5	
P0345	2	F60	1	Ground	Approx. 5	

Is the inspection result normal?

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

P0340, P0345 CMP SENSOR (PHASE)

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

				/ER SUPPL			<u> </u>
1. Turn iç 2. Discor	gnition swit	tch OFF. I harness co	onnector.				
3. Check	the contin	iuity detwee	en CMP se	ensor (PHA:	SE) narness	s connector ar	nd ECM harness connector.
DTO	CM	P sensor (PH/	ASE)	EC	CM		-
DTC	Bank	Connector	Terminal	Connector	Terminal	Continuity	
P0340	1	F55	1	F14	92	Existed	-
P0345	2	F60	1	- 114	92	LAISIEU	
YES > NO >	> Check se > Repair o	r replace er	ror-detect	circuit. Ref ed parts. UND CIRC		<u>9, "Diagnosis</u>	Procedure".
2. Discoi	the contin	l harness co nuity betwee	en CMP se			s connector ar	nd ECM harness connector.
DTC		P sensor (PH			CM	Continuity	
D0240	Bank	Connector	Terminal	Connector	Terminal		-
P0340 P0345	1	F55 F60	2	F14	90	Existed	
NO >		pen circuit, NSOR (PH/	ASE) INPL	JT SIGNAL	CIRCUIT	r in harness or	r connectors. nd ECM harness connector.
		-					_
DTC	CM	P sensor (PH/	ASE)	EC	CM	Continuity	
	Bank	Connector	Terminal	Connector	Terminal		_
P0340	1	F55	3	F14	84	Existed	
P0345	2	F60	3		89		-
l <u>s the insp</u> YES > NO >	<u>ection rest</u> > GO TO 6 > Repair o	<u>ult normal?</u> ၀. pen circuit,	short to g	d and short round or sh OR (PHAS)	ort to powe	r in harness o	r connectors.
Is the insp YES > NO > 7.CHECK	ection resu > GO TO 7 > Replace	<u>ult normal?</u> 7. malfunctior				nponent Insp HASE). Refer	<u>ection"</u> . to <u>EM-51, "Exploded View"</u> .
Check the	following.						

P0340, P0345 CMP SENSOR (PHASE)

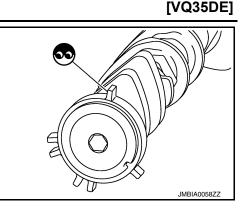
< DTC/CIRCUIT DIAGNOSIS >

- 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 <u>EM-79</u>, "<u>Removal</u> and Installation".



INFOID:0000000011939838

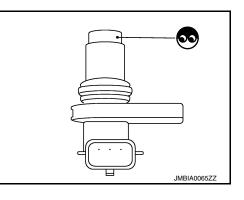
Component Inspection

1.CHECK CAMSHAFT POSITION SENSOR (PHASE)-I

- 1. Turn ignition switch OFF.
- 2. Loosen the fixing bolt of the sensor.
- 3. Disconnect camshaft position sensor (PHASE) harness connector.
- 4. Remove the sensor.
- 5. Visually check the sensor for chipping.

Is the inspection result normal?

- YES >> GO TO 2.
- NO >> Replace malfunctioning camshaft position sensor (PHASE). Refer to EM-51, "Exploded View".



2. CHECK CAMSHAFT POSITION SENSOR (PHASE)-II

Check the resistance camshaft position sensor (PHASE) terminals as per the following.

n sensor (PHASE)		
_	Resistance [Ω at 25°C (77°F)]	
(Polarity)		
2		
3	Except 0 or ∞	
3		
	n sensor (PHASE) - s (Polarity) 2 3 3 3	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace malfunctioning camshaft position sensor (PHASE). Refer to EM-51, "Exploded View".

< DTC/CIRCUIT DIAGNOSIS >

P0420, P0430 THREE WAY CATALYST FUNCTION

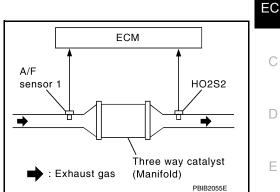
DTC Description

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.



- 1. Three way catalyst (manifold) does not operate properly.
- 2. Three way catalyst (manifold) does not have enough oxygen storage capacity.

DTC	CONSULT screen terms (Trouble diagnosis content)		DTC	C detection condition
			Diagnosis condition	-
			Signal (terminal)	-
	P0420 TW CATALYST SYS-B1 (Catalyst system efficiency below threshold bank 1) TW CATALYST SYS-B2 (Catalyst system efficiency below threshold bank 2)	1	Threshold	Three way catalyst (manifold) does not oper- ate properly
D0420			Diagnosis delay time	-
P0420			Diagnosis condition	-
			Signal (terminal)	-
		2	Threshold	Three way catalyst (manifold) does not have enough oxygen storage capacity
			Diagnosis delay time	-
			Diagnosis condition	-
			Signal (terminal)	-
		1	Threshold	Three way catalyst (manifold) does not oper- ate properly
D0420			Diagnosis delay time	-
P0430			Diagnosis condition	-
			Signal (terminal)	-
		2	Threshold	Three way catalyst (manifold) does not have enough oxygen storage capacity
			Diagnosis delay time	—

POSSIBLE CAUSE

P0420

- Three way catalyst (manifold)
- Exhaust tube
- · Intake air leakage
- Fuel injector
- Fuel injector leakage
- Spark plug
- Improper ignition timing

P0430

А

F

[VQ35DE]

Р

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< DTC/CIRCUIT DIAGNOSIS >

- Exhaust tube
- Intake air leakage
- Fuel injector
- Fuel injector leakage
- Spark plug
- Improper ignition timing
- Harness or connectors (The sensor circuit is open or shorted.)
- Fuel tank temperature sensor

FAIL-SAFE

Not applicable

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.
- 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 "COOLANT TEMP/S" indicates more than 70°C (158°F).
- If not, warm up engine and go to next step when "COOLANT TEMP/S" indication reaches 70°C (158°F). 9. Open engine hood.
- 10. Select "DTC & SRT CONFIRMATION" then "SRT WORK SUPPORT" mode with CONSULT.
- 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.

< DTC/CI	RCUIT DI	AGNOSIS >			[VQ35DE]		
5.PERF	ORM DTC	CONFIRMATION	N PROCE	DURE AGAIN			
1. Stop	engine and	l cool it down to ONFIRMATION I	less than	70°C (158°F).			
•	>> GO TO						
		CONFIRMATION	N PROCE	DURE-III			
	t trip DTC. DTC detec	ted?					
YES >	>> Proceed	l to <u>EC-337, "Dia</u>	ignosis Pr	<u>rocedure"</u> .			
_		TION END PONENT FUNC	TION CH	FCK			
1. Start 2. Turn 3. Turn 4. Turn 5. Start 6. Let ei 7. Open	ignition swi ignition swi ignition swi engine and ngine idle f engine ho	I warm it up to th tch OFF and wa tch ON. tch OFF and wa I keep the engine or 1 minute. od.	it at least it at least e speed be	10 seconds.	at least 1 minute under no load. following conditions.		
		ECM					
DTC	Connec-	+	_	Condition Voltage (V)			
	tor	Terminal	Terminal				
P0420 P0430	F13	41 32	35	Keeping engine speed at 2,500 rpm constant under no load	The voltage fluctuation cycle takes more than 5 seconds. • 1 cycle: $0.6 - 1.0 \rightarrow 0 - 0.3 \rightarrow 0.6 - 1.0$		
YES-1 > YES-2 > NO > Diagnos	>> To checl >> Confirm >> Proceed sis Proce	ation after repair I to <u>EC-337, "Dia</u>	: ÍNSPEC		ermittent Incident". INFOID:000000011939840		
•		ust tubes and mu	uffler for d	ents.			
	oection res	ult normal?					
		z. or replace malfur	nctioning p	part.			
2.CHEC	K EXHAUS	ST GAS LEAKAG	θE				
		l run it at idle. naust gas leakag	e before t	the three way catalyst (manifold).		
				nree way catalyst Three way catal	vst		

< DTC/CIRCUIT DIAGNOSIS >

Is exhaust gas leakage detected?

YES >> Repair or replace malfunctioning part.

NO >> GO TO 3.

3.CHECK INTAKE AIR LEAKAGE

Listen for an intake air leakage after the mass air flow sensor.

Is intake air leakage detected?

YES >> Repair or replace malfunctioning part.

NO >> GO TO 4.

4.CHECK IGNITION TIMING

Check idle speed and ignition timing. For procedure, refer to <u>EC-164, "Work Procedure"</u>. For specification, refer to <u>EC-587, "Idle Speed"</u> and <u>EC-587, "Ignition Timing"</u>.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Follow the <u>EC-164, "Work Procedure"</u>.

5.CHECK FUEL INJECTORS

1. Stop engine and then turn ignition switch ON.

2. Check the voltage between ECM harness connector terminals.

+		-	_	
Connector	Terminal	Connector	Terminal	
	11			
	12	E10	152	Battery voltage
F13	16			
FIS	17			
	21			
	22			

Is the inspection result normal?

YES >> GO TO 6.

NO >> Perform <u>EC-550</u>, "Diagnosis Procedure".

6.CHECK FUNCTION OF IGNITION COIL-I

CAUTION:

Perform the following procedure in a place with no combustible objects and good ventilation.

- 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.

< DTC/CIRCUIT DIAGNOSIS >

- 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.

7.CHECK FUNCTION OF IGNITION COIL-II

- 1. Turn ignition switch OFF.
- 2. Disconnect spark plug and connect a known-good spark plug.
- 3. Crank engine for approximately 3 seconds, and recheck whether spark is generated between the spark H plug and the grounded metal portion.

Spark should be generated.

Is the inspection result normal?

YES >> GO TO 8.

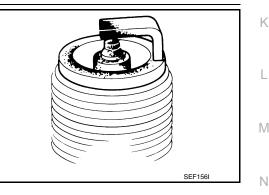
NO >> Check ignition coil, power transistor and their circuit. Refer to <u>EC-555, "Diagnosis Procedure"</u>.

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 <u>EM-140</u>, "Spark Plug".
- NO >> Repair or clean spark plug. Then GO TO 9.



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.

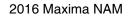
Spark should be generated.

Is the inspection result normal?

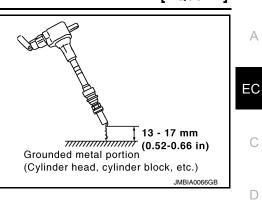
- YES >> INSPECTION END
- NO >> Replace spark plug(s) with standard type one(s). For spark plug type, refer to <u>EM-140, "Spark</u> <u>Plug"</u>.

10. CHECK FUEL INJECTOR

1. Turn ignition switch OFF.







Ρ

< DTC/CIRCUIT DIAGNOSIS >

- Remove fuel injector assembly. Refer to <u>EM-46. "Removal and Installation"</u>. Keep fuel hose and all fuel injectors connected to fuel tube.
- 3. Disconnect all ignition coil harness connectors.
- 4. Reconnect all fuel injector harness connectors disconnected.
- 5. Turn ignition switch ON.
- 6. Check that 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 <u>EM-46, "Removal and Installa-</u> tion".
- NO >> INSPECTION END

P0441 EVAP CONTROL SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

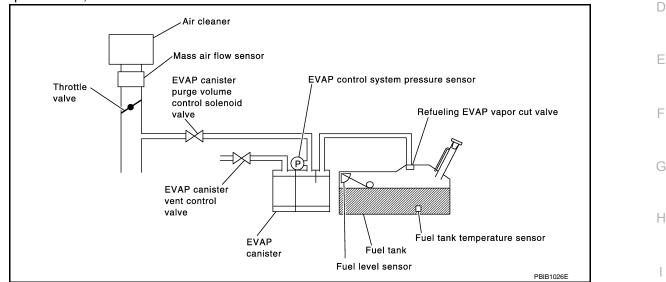
P0441 EVAP CONTROL SYSTEM

DTC Description

DTC DETECTION LOGIC

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.



EVAP control system does not operate properly, EVAP control system has a leakage between intake manifold and EVAP control system pressure sensor.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		0
		Diagnosis condition	—	K
		Signal (terminal)	_	
P0441	EVAP PURG FLOW/MON (Evaporative emission system incorrect purge flow)	Threshold	EVAP control system does not operate prop- erly, EVAP control system has a leakage be- tween intake manifold and EVAP control system pressure sensor	L
		Diagnosis delay time	—	M

POSSIBLE CAUSE

- · 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

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

Ν

Ρ

[VQ35DE]

INFOID:000000011939841

P0441 EVAP CONTROL SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

If DTC P0441 is displayed with other DTC such as P2122, P2123, P2127, P2128 or P2138, first perform trouble diagnosis for other DTC.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to EC-107, "DTC Index".
- NO >> GO TO 2.

2.INSPECTION START

Will CONSULT be used?

Will CONSULT be used?

YES >> GO TO 3. NO >> GO TO 7.

NU >> GU IU /. **^**

3. 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 4.

4.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.
- 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.
- Select "PURG FLOW P0441" of "EVAPORATIVE SYSTEM" in "DTC WORK SUPPORT" mode with CON-SULT.
- 7. Touch "START".

Is "COMPLETED" displayed on CONSULT screen?

YES >> GO TO 6.

NO >> GO TO 5.

5.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.)

Selector lever	Suitable position
VHCL SPEED SE	32 - 120 km/h (20 - 75 mph)
ENG SPEED	500 - 3,000 rpm
B/FUEL SCHDL	1.25 - 7.2 msec
COOLANT TEMP/S	More than 0°C (32°F)

CAUTION:

Always drive vehicle at a safe speed.

If "TESTING" does not change for a long time, retry from step 2.

Is "COMPLETED" displayed on CONSULT screen?

- YES >> GO TO 6.
- NO >> Perform DTC CONFIRMATION PROCEDURE again. GO TO 3.

6.PERFORM DTC CONFIRMATION PROCEDURE-III

Touch "SELF-DIAG RESULTS".

Which is displayed on CONSULT screen?

DAAA EVAD CONTDOL EVETEM

	P0441	1 EVAP CONTROL SYSTEM	
< DTC/CIRCUIT DIA	GNOSIS >		[VQ35DE]
OK-2 >> Confirma NG >> Proceed	tion after repair: IN to <u>EC-343, "Diagno</u>	osis Procedure".	A
7.PERFORM COMP	ONENT FUNCTIO	DN CHECK	FO
 Turn ignition swite Turn ignition swite Turn ignition swite Start engine and 	els. C switch OFF) and ch OFF, wait at lea: ch ON. ch OFF, wait at lea: wait at least 70 sec	ast 10 seconds.	C D
	ECM		E
	+	_	L
Connector	Ter	rminal	
E10	121	148	F
9. Establish and ma	intain the following	re sensor value at idle speed and note it. g conditions for at least 1 minute.	G
Air conditioner switch	ON		
Head lamp switch	ON		Н
Rear window defogger sv			
Engine speed	Approx. 3,000		1
Gear position		other than P, N or R ssure sensor value stays 0.1 V less than the value at idle	speed (mea
	or at least 1 second		
Is the inspection resu	<u>lt normal?</u>		J
YES-2 >> Confirma			K
Diagnosis Proce	dure	"	NFOID:0000000011939842
1. CHECK DTC PRIC	ORITY		L
	ayed with other DT r DTC.	TC such as P2122, P2123, P2127, P2128 or P2138, first	perform trou-
		able. Refer to <u>EC-107, "DTC_Index"</u> .	
NO >> GO TO 2			Ν
2.CHECK EVAP CA	NISTER		
 Turn ignition swite Check EVAP can 	ister for cracks.		0
Is the inspection resu			
YES-1 >> With CON YES-2 >> Without C		4.	P
NO >> Replace	EVAP canister. Ref	fer to FL-15, "Removal and Installation".	
3.CHECK PURGE F	LOW		

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-46</u>, <u>"EVAPORATIVE</u> 1. EMISSION SYSTEM : System Description".

< DTC/CIRCUIT DIAGNOSIS >

- 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 8.

NO >> GO TO 5.

4.CHECK PURGE FLOW

Without CONSULT

- 1. Start engine and warm it up to normal operating temperature.
- 2. Stop engine.
- Disconnect vacuum hose connected to EVAP canister purge volume control solenoid valve at EVAP service port and install vacuum gauge. For the location of EVAP service port, refer to <u>EC-46</u>, <u>"EVAPORATIVE EMISSION SYSTEM : System Description"</u>.
- Start engine and let it idle.
 Do not depress accelerator pedal even slightly.
- 5. Check vacuum gauge indication before 60 seconds pass after starting engine.

Vacuum should not exist.

6. Rev engine up to 2,000 rpm after 100 seconds pass after starting engine.

Vacuum should exist.

Is the inspection result normal?

YES >> GO TO 8. NO >> GO TO 5.

5. CHECK EVAP PURGE LINE

- 1. Turn ignition switch OFF.
- Check EVAP purge line for improper connection or disconnection. Refer to <u>EC-46. "EVAPORATIVE EMISSION SYSTEM : System Description"</u>.

Is the inspection result normal?

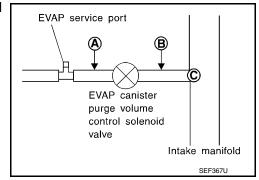
YES >> GO TO 6.

NO >> Repair EVAP purge line.

6.CHECK EVAP PURGE HOSE AND PURGE PORT

1. Disconnect purge hoses connected to EVAP service port **A** and EVAP canister purge volume control solenoid valve **B**.

2. Blow air into each hose and EVAP purge port C.



P0441 EVAP CONTROL SYSTEM

IVQ35DE1 < DTC/CIRCUIT DIAGNOSIS > 3. Check that air flows freely. А Is the inspection result normal? YES-1 >> With CONSULT: GO TO 7. YES-2 >> Without CONSULT: GO TO 8. NO >> Repair or clean hoses and/or purge port. EC Intake manifold SEF368U D 7.CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE (P)With CONSULT 1. Start engine. 2. 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 >> GO TO 9. NO >> GO TO 8. 8.CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE Check EVAP canister purge volume control solenoid valve. Refer to EC-351, "Component Inspection". Is the inspection result normal? Н YES >> GO TO 9. >> Replace EVAP canister purge volume control solenoid valve. Refer to EC-15. "ENGINE CON-NO TROL SYSTEM : Component Parts Location". 9.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR CONNECTOR Disconnect EVAP control system pressure sensor harness connector. Check that water is not inside connectors. 2. Is the inspection result normal? YES >> GO TO 10. NO >> Replace EVAP control system pressure sensor. Refer to FL-19, "Removal and Installation". Κ 10. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR FUNCTION Check EVAP control system pressure sensor function. Refer to EC-367, "DTC Description" for DTC P0452, EC-370, "DTC Description" for DTC P0453. L Is the inspection result normal? YES >> GO TO 11. NO >> Replace EVAP control system pressure sensor. Refer to FL-19, "Removal and Installation". M **11.**CHECK RUBBER TUBE FOR CLOGGING Disconnect rubber tube connected to EVAP canister vent control valve. 1. Ν Check the rubber tube for clogging. Is the inspection result normal? YES >> GO TO 12. NO >> Clean the rubber tube using an air blower. 12. CHECK EVAP CANISTER VENT CONTROL VALVE Check EVAP canister vent control valve. Refer to EC-356, "Component Inspection". Is the inspection result normal? YES >> GO TO 13. NO >> Replace EVAP canister vent control valve. Refer to FL-18. "Removal and Installation". 13. CHECK EVAP PURGE LINE

Inspect EVAP purge line (pipe and rubber tube). Check for evidence of leakage. Refer to <u>EC-46, "EVAPORATIVE EMISSION SYSTEM : System Description"</u>. < DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 14.

NO >> Repair EVAP purge line.

14.CLEAN EVAP PURGE LINE

Clean EVAP purge line (pipe and rubber tube) using air blower.

>> INSPECTION END

< DTC/CIRCUIT DIAGNOSIS >

P0443 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

DTC Description

INFOID:000000011939843

DTC DETECTION LOGIC

- The canister purge flow is detected during the vehicle is stopped while the engine is running, even when 1. EVAP canister purge volume control solenoid valve is completely closed.
- The canister purge flow is detected during the specified driving conditions, even when EVAP canister 2. С purge volume control solenoid valve is completely closed.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition			
			Diagnosis condition	—	
			Signal (terminal)	—	F
		1	Threshold	The canister purge flow is detected during the vehicle is stopped while the engine is run- ning, even when EVAP canister purge vol- ume control solenoid valve is completely closed	F
P0443	PURG VOLUME CONT/V (Evaporative emission system		Diagnosis delay time	—	
	purge control valve circuit)	2	Diagnosis condition		0
			Signal (terminal)		
			Threshold	The canister purge flow is detected during the specified driving conditions, even when EVAP canister purge volume control solenoid valve is completely closed	ŀ
			Diagnosis delay time	-	

POSSIBLE CAUSE

DTC P0443 - 1 • EVAP control system pressure sensor	J
 EVAP canister purge volume control solenoid valve (The valve is stuck open.) EVAP canister vent control valve EVAP canister Hoses 	K
(Hoses are connected incorrectly or clogged.)	
 DTC P0443 - 2 EVAP control system pressure sensor EVAP canister purge volume control solenoid valve (The valve is stuck open.) 	Μ
 EVAP canister vent control valve EVAP canister Hoses 	Ν
(Hoses are connected incorrectly or clogged.)	
FAIL-SAFE Not applicable	0
DTC CONFIRMATION PROCEDURE	Р
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.	

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

TESTING CONDITION:

А

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< DTC/CIRCUIT DIAGNOSIS >

- [VQ35DE]
- Perform "DTC CONFIRMATION PROCEDURE" when the fuel level is between 1/4 and 3/4 full, and vehicle is placed on flat level surface.
- Always perform test at a temperature of 5 to 60°C (41 to 140°F).
- Cool the vehicle so that engine coolant temperature becomes same level as ambient temperature.

Do you have CONSULT

YES >> GO TO 2. NO >> GO TO 4.

2.PERFORM DTC CONFIRMATION PROCEDURE 1

With CONSULT

- 1. Turn ignition switch ON.
- Check that the following condition are met. FUEL T/TMP SE: 0 - 35°C (32 - 95°F)
- 3. Start engine and wait at least 60 seconds.
- 4. Check 1st trip DTC.
- IS 1st trip DTC detected?

YES >> Proceed to EC-349, "Diagnosis Procedure".

NO >> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE 2

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.
- Select "PURG VOL CN/V P1444" of "EVAPORATIVE SYSTEM" in "DTC WORK SUPPORT" mode with CONSULT.
- 7. Touch "START".
- 8. Start engine and let it idle until "TESTING" on CONSULT changes to "COMPLETED". (It will take approximately 10 seconds.)
 - If "TESTING" is not displayed after 5 minutes, retry from step 2.

Touch "SELF-DIAG RESULTS".

Which is displayed on CONSULT screen?

- YES >> INSPECTION END
- NO >> Proceed to EC-349, "Diagnosis Procedure".

4.PERFORM DTC CONFIRMATION PROCEDURE 1

With GST

- 1. Turn ignition switch ON.
- 2. Set voltmeter probes to ECM harness connector terminals.

	ECM		
Connector	+	_	Voltage (V)
Connector	Terr		
E10	128	148	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-349, "Diagnosis Procedure".
- NO >> GO TO 5.

```
5.PERFORM DTC CONFIRMATION PROCEDURE 2
```

With GST

- T. 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.

				[VQ35DE]			
< DTC/CIRCUIT DIAGN				[vQ35DE]	-		
 Turn ignition switch C Start engine and let it 					А		
6. Check 1st trip DTC.			51100.				
Is 1st trip DTC displayed?							
YES >> Proceed to \underline{E}					EC		
NO-1 >> To check mal NO-2 >> Confirmation	Unction	n symptom befor	re repair: Re ∩N FND	fer to GI-41, "Intermittent Incident".			
					С		
Diagnosis Procedure	5			INFOID:00000001193984			
1.CHECK EVAP CANIST	ER PL	JRGE VOLUME	CONTROL	SOLENOID VALVE POWER SUPPLY			
1. Turn ignition switch C	FF.				D		
		urge volume cor	ntrol solenoio	d valve harness connector.			
 Turn ignition switch C Check the voltage be 		EVAP canister	purae volum	ne control solenoid valve harness connector and	E		
ground.							
		1					
+		_			F		
EVAP canister purge volume solenoid valve	control	-	Voltage	e			
Connector Term	inal	-			G		
F29 1		Ground	Battery vol	Itage			
Is the inspection result no	rmal?				Н		
YES >> GO TO 2.							
NO >> Perform the t		•					
Z .CHECK EVAP CANIST	ER PL	JRGE VOLUME	CONTROL	SOLENOID VALVE OUTPUT SIGNAL CIRCUIT			
1. Turn ignition switch C							
 Disconnect ECM harr Check the continuity 			r purae volui	me control solenoid valve harness connector and	IJ		
ECM harness connec			1-0		0		
EVAP canister purge volume trol solenoid valve	con-	ECM		Continuity	K		
Connector Termina	al	Connector	Terminal				
F29 2		F13	54	Existed	L		
4. Also check harness for	or short	t to ground and s	short to pow	er.			
Is the inspection result no		0	·				
YES >> GO TO 3.					M		
^		-	•	ower in harness or connectors.			
3.CHECK EVAP CONTR					N		
 Disconnect EVAP cor Check that water is not 			ensor harne	ss connector.			
Is the inspection result no		e connectors.			\circ		
YES >> GO TO 4.	<u>a::</u>				0		
	P contr	ol system press	ure sensor.	Refer to FL-19, "Removal and Installation".			
4.CHECK EVAP CONTR	OL SY	STEM PRESSU	IRE SENSO	R	Ρ		
Check EVAP control syste	em pres	ssure sensor. Re	efer to <u>EC-36</u>	65, "Component Inspection".			
Is the inspection result no	-						
YES-1 >> With CONSU							
	YES-2 >> Without CONSULT: GO TO 6.						

NO >> Replace EVAP control system pressure sensor. Refer to <u>FL-19</u>, "<u>Removal and Installation</u>".

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

5. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

With CONSULT

- 1. Turn ignition switch OFF.
- 2. Reconnect harness connectors disconnected.
- 3. Start engine.
- 4. 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 >> GO TO 7.

NO >> GO TO 6.

O.CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Check EVAP canister purge volume control solenoid valve. Refer to <u>EC-351, "Component Inspection"</u>. <u>Is the inspection result normal?</u>

- YES >> GO TO 7.
- NO >> Replace EVAP canister purge volume control solenoid valve. Refer to <u>EC-15, "ENGINE CON-</u> <u>TROL SYSTEM : Component Parts Location"</u>.

7.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 8.

NO >> Clean the rubber tube using an air blower.

8.CHECK EVAP CANISTER VENT CONTROL VALVE

Check EVAP canister vent control valve. Refer to EC-356, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace EVAP canister vent control valve. Refer to FL-18, "Removal and Installation".

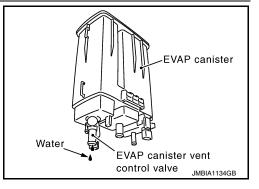
9.CHECK IF EVAP CANISTER IS SATURATED WITH WATER

Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached. Refer to <u>FL-19</u>, <u>"Removal and Installation"</u>.

Does water drain from the EVAP canister?

YES >> GO TO 10.

NO >> INSPECTION END



10.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 >> INSPECTION END NO >> GO TO 11. **11**.DETECT MALFUNCTIONING PART

Check the following.

EVAP canister for damage

• EVAP hose between EVAP canister and vehicle frame for clogging or poor connection

< DTC/CIRCUIT DIAGNOSIS >

>> Repair hose or replace EVAP canister. Refer to <u>FL-15. "Removal and Installation"</u>.

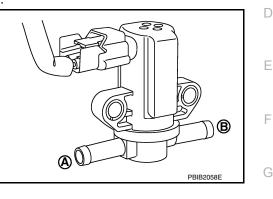
Component Inspection

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.
- 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

- 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 \textcircled{A} and \textcircled{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>EC-15. "ENGINE CON-</u> <u>TROL SYSTEM : Component Parts Location"</u>.

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INFOID:0000000011939845

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< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

P0444, P0445 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

DTC Description

INFOID:000000011939846

DTC DETECTION LOGIC

• An excessively low voltage signal is sent to ECM through the valve.

• An excessively high voltage signal is sent to ECM through the valve.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
		Diagnosis condition	Start engine and let it idle
PURG VOLUME CONT/V P0444 (Evaporative emission system control valve circuit open)	PURG VOLUME CONT/V (Evaporative emission system purge	Signal (terminal)	Voltage signal transmitted from EVAP canis- ter purge volume control solenoid valve to ECM
	control valve circuit open)	Threshold	An excessively low voltage signal is sent to ECM through the valve
		Diagnosis delay time	—
PURG VOLUME CONT/V P0445 (Evaporative emission syster control valve circuit shorted)		Diagnosis condition	Start engine and let it idle
	PURG VOLUME CONT/V (Evaporative emission system purge	Signal (terminal)	Voltage signal transmitted from EVAP canis- ter purge volume control solenoid valve to ECM
	control valve circuit shorted)	Threshold	An excessively high voltage signal is sent to ECM through the valve
		Diagnosis delay time	—

POSSIBLE CAUSE

DTC P0444

- Harness or connectors
- (The solenoid valve circuit is open or shorted.)
- EVAP canister purge volume control solenoid valve

DTC P0445

- Harness or connectors
- (The solenoid valve circuit is shorted.)
- EVAP canister purge volume control solenoid valve

FAIL-SAFE

Not applicable

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?

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

	neck malfunction	8. "Diagnosis Pr on symptom be repair: INSPEC	fore repair: Re	fer to <u>GI-41, "I</u>	ntermittent Incident".
iagnosis Pro	ocedure				INFOID:000000011939847
.CHECK EVAF	CANISTER F	URGE VOLUM	IE CONTROL	SOLENOID VA	LVE POWER SUPPLY
Turn ignition	EVAP canister switch ON.	purge volume c n EVAP caniste			s connector. noid valve harness connector and
+	-				
EVAP canister pur solenoio			Voltage	9	
Connector	Terminal				
F29	1	Ground	Battery vol	tage	
	FO 2. frm the trouble	e diagnosis for p			
.CHECK EVAP	CANISTER F	VURGE VOLUM	IE CONTROL	SOLENOID VA	LVE OUTPUT SIGNAL CIRCUIT
Turn ignition	switch OFF. ECM harness o	opportor			
	ontinuity betwe		ter purge volu	me control sole	noid valve harness connector and
EVAP canister purg trol solenoi		EC	СМ	Continuity	-
		EC Connector	CM Terminal	Continuity	-
trol solenoi Connector F29	d valve Terminal 2	Connector F13	Terminal 54	Existed	- - -
trol solenoiConnectorF29Also check hthe inspectionYES-1 >> WithYES-2 >> WithYES-2 >> WithYO >> Reparation	d valve Terminal 2 arness for sho result normal? CONSULT: Go out CONSULT air open circuit	Connector F13 ort to ground and O TO 3. : GO TO 4. , short to groun	Terminal 54 d short to powe	Existed er. ower in harnes	- - s or connectors. ALVE OPERATION
trol solenoi Connector F29 Also check h the inspection YES-1 >> With YES-2 >> With YO >> Reparation O.CHECK EVAP With CONSUL Reconnect a Start engine. Perform "PU according to	d valve Terminal 2 arness for sho result normal? CONSULT: Ge out CONSULT: air open circuit CANISTER F CANISTER F Il harness cont RG VOL C/V' the valve oper	Connector F13 ort to ground and O TO 3. GO TO 4. , short to groun PURGE VOLUM nectors disconr ' in "ACTIVE T hing.	Terminal 54 d short to power d or short to power IE CONTROL nected.	Existed er. ower in harnes SOLENOID VA	
trol solenoi Connector F29 Also check h the inspection YES-1 >> With YES-2	d valve Terminal 2 arness for sho result normal? CONSULT: Ge out CONSULT: Ge out CONSULT: air open circuit CANISTER F I harness cont RG VOL C/V' the valve oper ed vary accord PECTION END	Connector F13 ort to ground and O TO 3. GO TO 4. , short to groun PURGE VOLUM nectors disconr ' in "ACTIVE T hing. ting to the value	Terminal 54 d short to power d or short to power IE CONTROL nected.	Existed er. ower in harnes SOLENOID VA	LVE OPERATION
trol solenoi Connector F29 Also check h the inspection YES-1 >> With YES-2 >> With YO >> Reparation OCHECK EVAP With CONSUL Reconnect a Start engine. Perform "PU according to oes engine spender YES >> INSP	d valve Terminal 2 arness for sho result normal? CONSULT: Ge out CONSULT: CONSULT: Ge out CONSULT: CONSULT: Ge out CONSULT: CONSULT: Ge out CONSULT: CONSULT: Ge out CONSULT: CONSULT: Ge out CONSULT: Generation Constant CONSULT: Generation CONSULT: Generation CON	Connector F13 ort to ground and O TO 3. GO TO 4. , short to groun PURGE VOLUM nectors disconr ' in "ACTIVE T hing. ting to the value	Terminal 54 d short to power d or short to power IE CONTROL nected. EST" mode were e opening?	Existed er. SOLENOID VA	LVE OPERATION Check that engine speed varies

< DTC/CIRCUIT DIAGNOSIS >

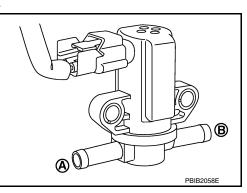
Component Inspection

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.
- 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.

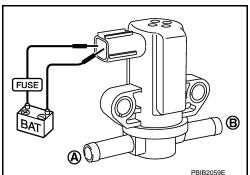
Condition (PURG VOL C/V value)	Air passage continuity between \textcircled{B} and \textcircled{B}
100%	Existed
0%	Not existed



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.
- Check air passage continuity of EVAP canister purge volume control solenoid valve under the following conditions.

Condition	Air passage continuity between $$ and $$	
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>EC-15. "ENGINE CON-</u> <u>TROL SYSTEM : Component Parts Location"</u>.

[VQ35DE]

INFOID:0000000011939848

< DTC/CIRCUIT DIAGNOSIS >

P0447 EVAP CANISTER VENT CONTROL VALVE

DTC Description

INFOID:000000011939849

[VQ35DE]

DTC DETECTION LOGIC

An improper voltage signal is sent to ECM through EVAP canister vent control valve.

	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
		Diagnosis condition	Start engine and let it idle
P0447 VENT CONTROL VALVE (Evaporative emission system vent control circuit open)		Signal (terminal)	Voltage signal transmitted from EVAP canis- ter vent control valve to ECM
	Threshold	An improper voltage signal is sent to ECM through EVAP canister vent control valve	
		Diagnosis delay time	
(The valveEVAP canHoses	E CAUSE or connectors e circuit is open or shorted.) ister vent control valve re connected incorrectly or clogge	.d.)	
FAIL-SAFE	E	,	
DTC CONF	FIRMATION PROCEDURE		
1.PRECOM	NDITIONING		
Turn igr	IIIION SWITCH OFF and wait at leas	st 10 seconds.	
TESTING C Before perf	nition switch OFF and wait at leas CONDITION: forming the following procedur GO TO 2.		oltage is more than 11 V at idle.
TESTING C Before perf	CONDITION: forming the following procedur	e, confirm battery vo	oltage is more than 11 V at idle.
TESTING C Before perf 2.PERFOF 1. Start en 2. Check C Is 1st trip D YES >> NO-1 >>	CONDITION: forming the following procedur GO TO 2. RM DTC CONFIRMATION PROC agine and wait at least 8 seconds. 1st trip DTC. TC detected? Proceed to <u>EC-355, "Diagnosis F</u> To check malfunction symptom b	e, confirm battery vo EDURE <u>Procedure"</u> . before repair: Refer to	
TESTING C Before perf 2.PERFOF 1. Start en 2. Check C Is 1st trip D YES >> NO-1 >> NO-2 >>	CONDITION: forming the following procedur GO TO 2. RM DTC CONFIRMATION PROC Ingine and wait at least 8 seconds. 1st trip DTC. TC detected? Proceed to EC-355, "Diagnosis F	e, confirm battery vo EDURE <u>Procedure"</u> . before repair: Refer to	
TESTING C Before perf 2.PERFOF 1. Start en 2. Check Is 1st trip D YES >> NO-1 >> NO-2 >> Diagnosis	CONDITION: forming the following procedur GO TO 2. RM DTC CONFIRMATION PROC Ingine and wait at least 8 seconds. 1st trip DTC. TC detected? Proceed to <u>EC-355, "Diagnosis F</u> To check malfunction symptom b Confirmation after repair: INSPE	e, confirm battery vo EDURE <u>Procedure"</u> . before repair: Refer to	GI-41, "Intermittent Incident".

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< DTC/CIRCUIT DIAGNOSIS >

- 2. Select "VENT CONTROL/V" in "ACTIVE TEST" mode with CONSULT.
- 3. Touch "ON/OFF" on CONSULT screen.
- 4. Check for operating sound of the valve.

Clicking sound should be heard.

Is the inspection result normal?

YES >> GO TO 6. NO >> GO TO 3.

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 $\mathbf{3}$.check evap canister vent control valve power supply

- 1. Turn ignition switch OFF.
- 2. Disconnect EVAP canister vent control valve harness connector.
- 3. Turn ignition switch ON.
- 4. Check the voltage between EVAP canister vent control valve harness connector and ground.

	+		
EVAP canister v	ent control valve	_	Voltage
Connector Terminal			
B39	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.

NO >> Perform the trouble diagnosis for power supply circuit.

4.CHECK EVAP CANISTER VENT CONTROL VALVE OUTPUT SIGNAL CIRCUIT

- 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.

EVAP canister vent control valve		ECM		Continuity
Connector	Terminal	Connector	Terminal	Continuity
B39	2	E10	141	Existed

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

Is the inspection result normal?

YES >> GO TO 5.

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

5.CHECK 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 6.

NO >> Clean the rubber tube using an air blower.

6.CHECK EVAP CANISTER VENT CONTROL VALVE

Check EVAP canister vent control valve. Refer to EC-356. "Component Inspection".

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Replace EVAP canister vent control valve. Refer to FL-18, "Removal and Installation".

Component Inspection

INFOID:0000000011939851

1.CHECK EVAP CANISTER VENT CONTROL VALVE-I

1. Remove EVAP canister vent control valve from EVAP canister. Refer to FL-18, "Removal and Installation".

EC-356

< DTC/CIRCUIT DIAGNOSIS >

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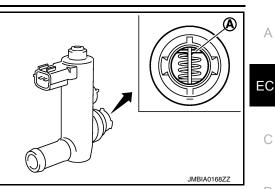
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2. Check portion (A) of EVAP canister vent control valve for rust.

Is it rusted?

- YES >> Replace EVAP canister vent control valve. Refer to FL-18, "Removal and Installation".
- NO >> GO TO 2.



2. CHECK EVAP CANISTER VENT CONTROL VALVE-II

With CONSULT

- 1. Reconnect harness connectors disconnected.
- Turn ignition switch ON. 2.
- 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.

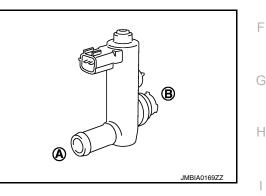
Condition VENT CONTROL/V	Air passage continuity between (A) and (B)
ON	Not existed
OFF	Existed

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 Not existed terminals 1 and 2 Existed

Operation takes less than 1 second.

Is the inspection result normal?

YES >> INSPECTION END

3.CHECK EVAP CANISTER VENT CONTROL VALVE-III

(P)With CONSULT

OFF

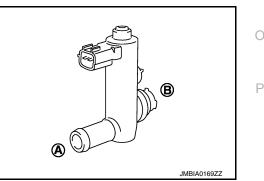
- 1. Clean the air passage [portion (A) to (B)] of EVAP canister vent control valve using an air blower.
- Perform "VENT CONTROL/V" in "ACTIVE TEST" mode.
- Check air passage continuity and operation delay time. 3. Check that new O-ring is installed properly.

Condition VENT CONTROL/V	Air passage continuity between (A) and (B)
ON	No
OFF	Yes

Operation takes less than 1 second.

Without CONSULT

- Clean the air passage [portion (A) to (B)] of EVAP canister vent 1 control valve using an air blower.
- 2. Check air passage continuity and operation delay time under the following conditions.





< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

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-18, "Removal and Installation"</u>.

< DTC/CIRCUIT DIAGNOSIS >

P0448 EVAP CANISTER VENT CONTROL VALVE

DTC Description

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DTC DETECTION LOGIC

EVAP canister vent control valve remains closed under specified driving conditions.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		(
VENT CONTROL VALVE P0448 (Evaporative emission system vent control circuit shorted)	Diagnosis condition	—	-	
	Signal (terminal)	—	-	
	Threshold	EVAP canister vent control valve remains closed under specified driving conditions	-	
	Diagnosis delay time	-	-	

POSSIBLE CAUSE

- · 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

FAIL-SAFE Not applicable

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.

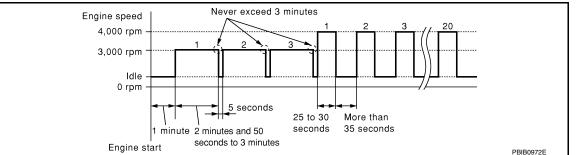
2. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

- 1. Turn ignition switch ON and wait at least 5 seconds.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT.
- 4. Start engine and let it idle for at least 1 minute.
- 5. Repeat next procedures 3 times.
- Increase the engine speed up to 3,000 to 3,500 rpm and keep it for 2 minutes and 50 seconds to 3 minutes.

Never exceed 3 minutes.

- Fully released accelerator pedal and keep engine idle for about 5 seconds.
- 6. Repeat next procedure 20 times.
- Quickly increase the engine speed up to 4,000 to 4,500 rpm or more and keep it for 25 to 30 seconds.
- Fully released accelerator pedal and keep engine idle for at least 35 seconds.



< DTC/CIRCUIT DIAGNOSIS >

7. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to EC-360, "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:0000000011939853

IVQ35DE1

1.CHECK RUBBER TUBE

- 1. Turn ignition switch OFF.
- 2. Disconnect rubber tube connected to EVAP canister vent control valve.
- 3. Check the rubber tube for clogging.
- Is the inspection result normal?

YES >> GO TO 2.

- NO >> Clean rubber tube using an air blower.
- 2.CHECK EVAP CANISTER VENT CONTROL VALVE

Check EVAP canister vent control valve. Refer to EC-361. "Component Inspection".

Is he inspection result normal?

YES >> GO TO 3.

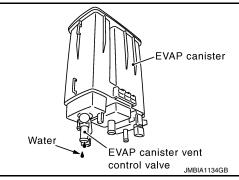
NO >> Replace EVAP canister vent control valve. Refer to FL-18, "Removal and Installation".

\mathbf{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-19</u>, "<u>Removal and Installation</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-15, "Removal and Installation".

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.

P0448 EVAP CANISTER VENT CONTROL VALVE

< DTC/CIRCUIT DIAGNOSIS >

NO >> Replace EVAP control system pressure sensor. Refer to FL-19, "Removal and Installation".

7.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Check EVAP control system pressure sensor. Refer to EC-365, "Component Inspection".

Is the inspection result normal?

YES >> INSPECTION END

>> Replace EVAP control system pressure sensor. Refer to FL-19, "Removal and Installation". NO

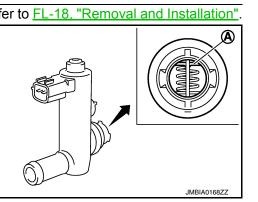
Component Inspection

1.CHECK EVAP CANISTER VENT CONTROL VALVE-I

- 1. Remove EVAP canister vent control valve from EVAP canister. Refer to FL-18, "Removal and Installation"
- 2. Check portion (A) of EVAP canister vent control valve for rust.

Is it rusted?

- YES >> Replace EVAP canister vent control valve. Refer to FL-18, "Removal and Installation".
- NO >> GO TO 2.



2.CHECK EVAP CANISTER VENT CONTROL VALVE-II

()With CONSULT

- Reconnect harness connectors disconnected.
- Turn ignition switch ON.
- 3. Perform "VENT CONTROL/V" in "ACTIVE TEST" mode.
- Check air passage continuity and operation delay time. 4

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.

eration takes less than 1 second

Is the inspection result normal?

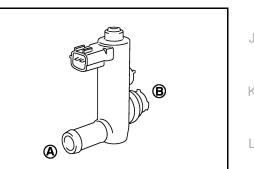
YES >> INSPECTION END

NO >> GO TO 3.

3.CHECK EVAP CANISTER VENT CONTROL VALVE-III

With CONSULT

- 1. Clean the air passage [portion (A) to (B)] of EVAP canister vent control valve using an air blower.
- Perform "VENT CONTROL/V" in "ACTIVE TEST" mode. 2.





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INFOID:000000011939854

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P0448 EVAP CANISTER VENT CONTROL VALVE

< 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.

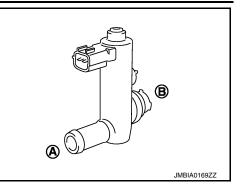
Condition	Air passage continuity between (A) and (B)
12 V direct current supply between terminals (1) and (2)	No
OFF	Yes

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-18. "Removal and Installation"</u>.



< DTC/CIRCUIT DIAGNOSIS >

P0451 EVAP CONTROL SYSTEM PRESSURE SENSOR

DTC Description

INFOID:000000011939855

[VQ35DE]

DTC DETECTION LOGIC

ECM detects a sloshing signal from the EVAP control system pressure sensor.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		1) I C detection condition	
		Diagnosis condition			
P0451	EVAP SYS PRES SEN (Evaporative emission system pressure	Signal (terminal)	Voltage signal transmitted from EVAP control system pressure sensor to ECM		
F 0431	sensor/switch range/performance)	Threshold	ECM detects a sloshing signal from the EVAP control system pressure sensor		
		Diagnosis delay time	_		
(EVAP co	ECAUSE or connectors ntrol system pressure sensor circu trol system pressure sensor	it is shorted.)			
FAIL-SAFE Not applical					
NOTE:	FIRMATION PROCEDURE				
	ove fuel filler cap during DTC co NDITIONING	ntirmation procedure	e.		
		roviouoly conducted	always perform the following pressive		
before cond	lucting the next test. hition switch OFF and wait at least	-	always perform the following procedure		
2. Turn iği	nition switch ON.				
3. Turn igi	nition switch OFF and wait at least	10 seconds.			
With CC	NSULT>>GO TO 2.				
	CONSULT>>GO TO 5.				
Z .PERFOF	RM DTC CONFIRMATION PROCE	DURE-1			
With CON 1. Start er					
1. Oluit Ci	noine and let it idle for least 40 sec	onds			
NOTE:	igine and let it idle for least 40 sec				
NOTE: Do not	depress accelerator pedal even				
NOTE: Do not 2. Check	-				
NOTE: Do not 2. Check Is 1st trip D YES >>	depress accelerator pedal even 1st trip DTC.	slightly.			
NOTE: Do not 2. Check Is 1st trip D YES >> NO >>	depress accelerator pedal even 1st trip DTC. <u>TC detected?</u> Proceed to <u>EC-364, "Diagnosis P</u>	slightly. rocedure".			
NOTE: Do not 2. Check is 1st trip D YES >> NO >> 3.PERFOF 9.With CON 1. Select ' 2. Let it id	depress accelerator pedal even 1st trip DTC. <u>TC detected?</u> Proceed to <u>EC-364. "Diagnosis P</u> GO TO 3. RM DTC CONFIRMATION PROCE	slightly. rocedure". DURE-2 DNITOR" mode of "EN			
NOTE: Do not 2. Check Is 1st trip D YES >> NO >> 3.PERFOF With CON 1. Select ' 2. Let it id NOTE: It will ta	depress accelerator pedal even 1st trip DTC. <u>TC detected?</u> Proceed to <u>EC-364, "Diagnosis P</u> GO TO 3. RM DTC CONFIRMATION PROCE NSULT 'EVAP DIAG READY" in "DATA MO	slightly. rocedure". DURE-2 DNITOR" mode of "EN DY" changes to "ON". of "EVAP DIAG REA			

EC

< DTC/CIRCUIT DIAGNOSIS >

5. Select "EVAP LEAK DIAG" in "DATA MONITOR" mode of "ENGINE".

6. Check that "EVAP LEAK DIAG" indication.

Which is displayed on CONSULT?

CMPLT>> GO TO 4.

YET >> 1. Perform DTC CONFIRMATION PROCEDURE again.

2. GO TO 1.

4.PERFORM DTC CONFIRMATION PROCEDURE-3

With CONSULT

Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to <u>EC-364</u>, "Diagnosis Procedure".

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

5.PERFORM DTC CONFIRMATION PROCEDURE-4

With GST

1. Start engine and let it idle for least 40 seconds. **NOTE:**

Do not depress accelerator pedal even slightly.

2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to EC-364, "Diagnosis Procedure".

NO >> GO TO 6.

6.PERFORM DTC CONFIRMATION PROCEDURE-5

With GST

- 1. Let it 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.
- Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to EC-364, "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:000000011939856

1. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR CONNECTOR FOR WATER

- 1. Disconnect EVAP control system pressure sensor harness connector.
- Check that water is not inside connectors.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

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	_	Voltage (V)
Connector	Terminal		
B41 3		Ground	Approx. 5

Is the inspection result normal?

< DTC/CIRCUIT DIAGNOSIS >

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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.

3. Check the continuity between EVAP control system pressure sensor harness connector and ECM harness connector.

EVAP control syste	em pressure sensor	EC	CM	Continuitu	
Connector	Terminal	Connector	Terminal	Continuity	
B41	3	E10	125	Existed	
the inspection	<u>result normal?</u>				
	PECTION END				
	air or replace er				
	P CONTROL SY	STEM PRES	SURE SENS	JR GROUNL	
•	n switch OFF. ECM harness co	nnector			
			rol system pi	essure sens	or harness connector and ECM har-
ness conne			, ,		
		_			
	em pressure sensor		СМ	- Continuity	,
Connector	Terminal	Connector	Terminal		
B41	1	E10	148	Existed	
	harness for shor	t to ground an	d short to pov	ver.	
	<u>result normal?</u>				
YES >> GO					
-	air or replace er				
J. CHECK EVA	P CONTROL SY	STEM PRES	SURE SENS	JR	
Check EVAP co	ntrol system pres	ssure sensor.	Refer to EC-3	65, "Compoi	<u>ent Inspection"</u> .
s the inspection	result normal?				
	PECTION END			Defer to El	10. "Demovel and leatellation"
		roi system pre	ssure sensor.	Refer to <u>FL-</u>	19, "Removal and Installation".
Component	Inspection				INFOID:000000011939857
	P CONTROL SY			חר	
		STEM PRES	SURE SENS	JR	
	n switch OFF.				
. Remove EV Installation"		em pressure se	ensor with its	narness con	nector. Refer to <u>FL-19, "Removal and</u>
	lace O-ring witl	n a new one.			
	uum pump to E		stem pressur	e sensor.	
. Turn ignitior	n switch ON and	check output	voltage betwe	en ECM terr	ninals under the following conditions.
T	ECM		Applied v	acuum kPa	
Connector	+	_		(cm ² . psi)	Voltage

Connector	+	-	(bar, kg/cm ² , psi)	Voltage
Connector	Terminal	Terminal		
			Not applied	1.8 - 4.8 V
E10	121	148	-26.7 (-0.267, -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 (–0.933 bar, –0.952 kg/cm², –13.53 psi) or pressure over 101.3 kPa (1.013 bar, 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-19</u>, "Removal and Installation".

< DTC/CIRCUIT DIAGNOSIS >

P0452 EVAP CONTROL SYSTEM PRESSURE SENSOR

DTC Description

INFOID:000000011939858

[VQ35DE]

DTC DETECTION LOGIC

An excessively low voltage from the sensor is sent to ECM.

DTC	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition
		Diagnosis condition	-
P0452	EVAP SYS PRES SEN	Signal (terminal)	Voltage signal transmitted from EVAP control system pressure sensor to ECM
P0452	(Evaporative emission system pressure sensor/switch low)	Threshold	An excessively low voltage from the sensor is sent to ECM
		Diagnosis delay time	
(EVAP cor	r connectors htrol system pressure sensor circu trol system pressure sensor	it is open or shorted.)	
Not applicat			
••	IRMATION PROCEDURE		
	IDITIONING		
2. Turn iğr 3. Turn igr TESTING C	nition switch OFF and wait at least nition switch ON. nition switch OFF and wait at least	10 seconds.	
~	GO TO 2.		
2.PERFOF	RM DTC CONFIRMATION PROCE	DURE	
With CO			
 Turn igr Turn igr 	gine and warm it up to normal ope nition switch OFF and wait at least nition switch ON. nition switch OFF and wait at least	10 seconds.	
5. Turn igr 6. Select " 7. Check t	nition switch ON. DATA MONITOR" mode with CON hat "FUEL T/TMP SE" is more tha gine and wait at least 20 seconds.	ISULT. n 0°C (32°F).	
9. Check 2	Ist trip DTC.		
With GS 1. Start en		arating temperature	
T. SIALLED	gine and warm it up to normal ope		
	meter probes to ECM harness con	inector terminals unde	er the following conditions.

ECM				
Connector	+	_		
Connector	Terr	ninal		
E10	128	148		

3. Check that the voltage is less than 4.2 V.

EC

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Turn ignition switch ON.
- 6. Turn ignition switch OFF and wait at least 10 seconds.
- 7. Start engine and wait at least 20 seconds.
- 8. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to EC-368, "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:0000000011939859

1.CHECK CONNECTOR

- 1. Disconnect EVAP control system pressure sensor harness connector.
- 2. Check that water is not inside connector.

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		_	Voltage (V)
Connector Terminal			
B41 3		Ground	Approx. 5

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

$\mathbf{3}$.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 system pressure sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	Continuity
B41	3	E10	125	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace harness connector.

4.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR GROUND 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 system pressure sensor		E	Continuity	
Connector	Terminal	Connector	Terminal	Continuity
B41	1	E10	148	Existed

	P0452 EVA	P CONTRO	L SYSTEM PRE	ESSUR	E SENSOR		
< DTC/CIR	CUIT DIAGNOSIS >	>				[VQ35DE]	
4. Also ch	eck harness for shor	t to ground and	short to power.				
-	ction result normal?						А
	GO TO 5.	abort to groupd	l ar abart ta nawar in	harpaga	or connectors		
_	Repair open circuit,	-	•				EC
	EVAP CONTROL SY						
	the continuity betwee onnector.	en EVAP contr	ol system pressure s	sensor ha	arness connector	and ECM har-	
1033 00							С
EVAP contro	l system pressure sensor	E	ECM		-		
Connecto	or Terminal	Connector	Terminal	Continuity			D
B41	2	E10	121	Existed	_		
2. Also ch	eck harness for shor	t to ground and	short to power.		-		
Is the inspe	ction result normal?	-	·				E
-	GO TO 6.						
~	Repair open circuit,	•	•	harness	or connectors.		F
D. CHECK	EVAP CONTROL SY	STEM PRESS	URE SENSOR				
	P control system pres	ssure sensor. F	Refer to <u>EC-369, "Cor</u>	nponent	Inspection".		
•	ction result normal?						G
	INSPECTION END Replace EVAP cont	rol avetom pros	sura concor Dofor to	EI 10 "	Romoval and Inst	allation"	
		or system pres		<u>1 L-19,</u>		anation	Н
Compone	ent Inspection					INFOID:0000000011939860	
1. CHECK	EVAP CONTROL SY	STEM PRESS	URE SENSOR				
	nition switch OFF.						
2. Remov	e EVAP control syste	m pressure sei	nsor with its harness	connecto	or. Refer to <u>FL-19,</u>	"Removal and	
Installa Alwaya							J
	s replace O-ring witl a vacuum pump to E\		tem pressure sensor				
	nition switch ON and				s under the follow	ing conditions.	
							K
	ECM		Applied vacuum kPa				
Connector	+	-	(bar, kg/cm ² , psi)		Voltage		L
	Terminal	Terminal					
540	404	140	Not applied		1.8 - 4.8 V		
E10	121	148	-26.7 (-0.267, -0.272, -3	.87) 2.1	to 2.5 V lower than above value		Μ
CAUTI							
	ys calibrate the vac	• • •		40.50	. n		Ν
	r apply below –93.3 3 bar, 1.033 kg/cm ² ,		bar, –0.952 kg/cm ² ,	–13.53 p	sı) or pressure o	over 101.3 KPa	
	s bar, 1.033 kg/cm ⁻ ,	14.03 psi).					0
							0
	Replace EVAP conti	rol system pres	sure sensor. Refer to	<u>FL-19, "</u>	Removal and Inst	allation".	
		· -					D

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< DTC/CIRCUIT DIAGNOSIS >

P0453 EVAP CONTROL SYSTEM PRESSURE SENSOR

DTC Description

INFOID:000000011939861

[VQ35DE]

DTC DETECTION LOGIC

An excessively high voltage from the sensor is sent to ECM.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
		Diagnosis condition	—	
D0452	EVAP SYS PRES SEN (Evaporative emission system pressure sensor/switch high)	Signal (terminal)	Voltage signal transmitted from EVAP control system pressure sensor to ECM	
F0400		Threshold	An excessively high voltage from the sensor is sent to ECM	
		Diagnosis delay time	—	

POSSIBLE CAUSE

- · Harness or connectors
- (EVAP control system pressure sensor circuit is open or shorted.)
- EVAP control system pressure sensor
- EVAP canister vent control valve
- EVAP canister
- Rubber hose from EVAP canister vent control valve to vehicle frame

FAIL-SAFE

Not applicable

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

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.

< DTC/CIRCUIT DIAGNOSIS >

+	M	<u>.</u>		
Connector	Terminal			
E10 128		148		
 Check that the voltage is les Turn ignition switch OFF an Turn ignition switch ON. Turn ignition switch OFF an 	d wait at least 10			
 Start engine and wait at lease Check 1st trip DTC. 		seconas.		
<u>s 1st trip DTC detected?</u> YES >> Proceed to <u>EC-371</u> , NO-1 >> To check malfunctio NO-2 >> Confirmation after re	on symptom befo	re repair: Refer	to <u>GI-41. "Intermittent Incident</u>	1.
Diagnosis Procedure				INFOID:0000000119398
1. CHECK CONNECTOR				
 Disconnect EVAP control sy Check that water is not insid 		ensor harness o	connector.	
is the inspection result normal? YES >> GO TO 2.				
NO >> Repair or replace ha				
2.CHECK EVAP CONTROL S 1. Turn ignition switch ON. 2. Check the voltage between		JRE SENSOR F	OWER SUPPLY	
. One on the voltage betweell	EVAP control sy	stem pressure s	sensor harness connector and	ground.
	EVAP control sy	stem pressure s	ensor harness connector and	ground.
+			ensor harness connector and	ground.
+ EVAP control system pressure sensor		Voltage (V)	ensor harness connector and -	ground.
+			ensor harness connector and -	ground.
+ EVAP control system pressure sensor Connector Terminal B41 3 Is the inspection result normal? YES >> GO TO 4. NO >> GO TO 3. 3.CHECK EVAP CONTROL SY	Ground	Voltage (V) Approx. 5	-	ground.
+ EVAP control system pressure sensor Connector Terminal B41 3 Is the inspection result normal? YES >> GO TO 4. NO >> GO TO 3. 3.CHECK EVAP CONTROL S 1. Turn ignition switch OFF. 2. Disconnect ECM harness control for the formation of t	Ground YSTEM PRESSU	Voltage (V) Approx. 5 JRE SENSOR F	-	
+ EVAP control system pressure sensor Connector Terminal B41 3 s the inspection result normal? YES >> GO TO 4. NO >> GO TO 3. 3.CHECK EVAP CONTROL S 1. Turn ignition switch OFF. 2. Disconnect ECM harness co 3. Check the continuity betwee ness connector. EVAP control system pressure sensor	Ground YSTEM PRESSU onnector. een EVAP contro	Voltage (V) Approx. 5 JRE SENSOR F ol system pressu	- - POWER SUPPLY CIRCUIT	
+ EVAP control system pressure sensor Connector Terminal B41 3 Sthe inspection result normal? YES >> GO TO 4. NO >> GO TO 3. S.CHECK EVAP CONTROL SN 1. Turn ignition switch OFF. 2. Disconnect ECM harness colspan="2">Connect ECM harness colspan="2">Connect ECM harness colspan="2">EVAP control system pressure sensor EVAP control system pressure sensor Connector	Ground Ground YSTEM PRESSU onnector. en EVAP contro En Connector	Voltage (V) Approx. 5 JRE SENSOR F ol system pressu	POWER SUPPLY CIRCUIT	
+ EVAP control system pressure sensor Connector Terminal B41 3 s the inspection result normal? YES >> GO TO 4. NO >> GO TO 3. S.CHECK EVAP CONTROL S` . Turn ignition switch OFF. 2. Disconnect ECM harness control system pressure sensor EVAP control system pressure sensor	Ground YSTEM PRESSU onnector. een EVAP contro	Voltage (V) Approx. 5 JRE SENSOR F ol system pressu	POWER SUPPLY CIRCUIT	

< DTC/CIRCUIT DIAGNOSIS >

3. Check the continuity between EVAP control system pressure sensor harness connector and ECM harness connector.

EVAP control system pressure sensor		E	СМ	Continuity
Connector	Terminal	Connector	Terminal	Continuity
B41	1	E10	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.

5.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR INPUT SIGNAL CIRCUIT

 Check the continuity between EVAP control system pressure sensor harness connector and ECM harness connector.

EVAP control syste	EVAP control system pressure sensor		ECM	
Connector	Terminal	Connector	Terminal	Continuity
B41	2	E10	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 RUBBER TUBE

1. Disconnect rubber tube connected to EVAP canister vent control valve.

2. Check the rubber tube for clogging.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Clean the rubber tube using an air blower, repair or replace rubber tube.

1.CHECK EVAP CANISTER VENT CONTROL VALVE

Check EVAP canister vent control valve. Refer to EC-373, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 8.

NO >> Replace EVAP canister vent control valve. Refer to <u>FL-18</u>, "Removal and Installation".

 $\mathbf{8}$.CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Check EVAP control system pressure sensor. Refer to EC-373, "Component Inspection".

Is the inspection result normal?

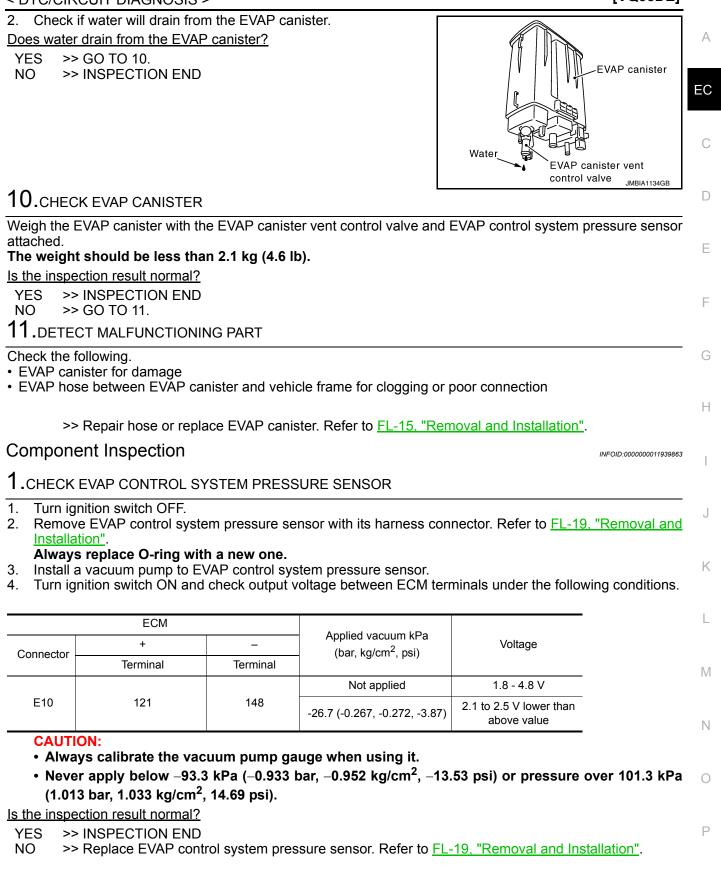
YES >> GO TO 9.

NO >> Replace EVAP control system pressure sensor. Refer to <u>FL-19</u>, "Removal and Installation".

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 <u>FL-19, "Removal and Installation"</u>.

< DTC/CIRCUIT DIAGNOSIS >



P0456 EVAP CONTROL SYSTEM

DTC Description

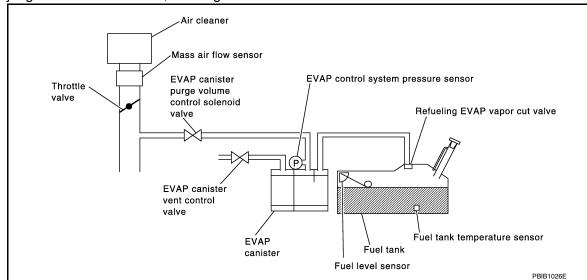
INFOID:000000011939864

IVQ35DE1

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.



1. EVAP system has a leak.

2. EVAP system does not operate properly.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
		Diagnosis condition	—	
	EVAP VERY SML LEAK [Evaporative emission system leak detected (very small leak)]		Signal (terminal)	—
		1	Threshold	EVAP system has a leak
D0456			Diagnosis delay time	—
P0430			Diagnosis condition	—
		2	Signal (terminal)	—
	2	Threshold	EVAP system does not operate properly	
			Diagnosis delay time	—

CAUTION:

- Use only a genuine NISSAN fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the MIL may come on.
- If the fuel filler cap is not tightened properly, the MIL may come on.
- Use only a genuine NISSAN rubber tube as a replacement.

POSSIBLE CAUSE

- · Incorrect fuel tank vacuum relief valve
- Incorrect fuel filler cap used
- Fuel filler cap remains open or fails to close.
- Foreign matter caught in fuel filler cap.
- Leak is in line between intake manifold and EVAP canister purge volume control solenoid valve.
- Foreign matter caught in EVAP canister vent control valve.
- EVAP canister or fuel tank leaks
- EVAP purge line (pipe and rubber tube) leaks
- EVAP purge line rubber tube bent
- Loose or disconnected rubber tube

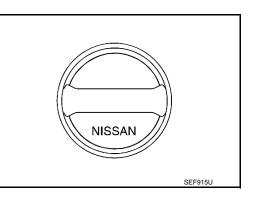
PU456 EVAP CONTROL STSTEM	
< DTC/CIRCUIT DIAGNOSIS > [VQ35E)E]
 EVAP canister vent control valve and the circuit EVAP canister purge volume control solenoid valve and the circuit Fuel tank temperature sensor O-ring of EVAP canister vent control valve is missing or damaged 	А
 EVAP canister is saturated with water EVAP control system pressure sensor Refueling EVAP vapor cut valve 	EC
 ORVR system leaks Fuel level sensor and the circuit Foreign matter caught in EVAP canister purge volume control solenoid valve 	С
FAIL-SAFE Not applicable	D
	E
If DTC Confirmation Procedure has been previously conducted, always perform the following before conduing the next test.	uct-
 Turn ignition switch OFF and wait at least 10 seconds. Turn ignition switch ON. Turn ignition switch OFF and wait at least 10 seconds. 	F
Do you have CONSULT?	G
YES >> GO TO 2. NO >> GO TO 4.	Ŭ
2. PERFORM DTC CONFIRMATION PROCEDURE-I	Н
 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:	J
 Never turn ignition switch ON during 90 minutes. Turn ignition switch ON and select "EVAP LEAK DIAG" in "DATA MONITOR" mode with CONSULT. Check that "EVAP LEAK DIAG" indication. 	K
Which is displayed on CONSULT? CMPLT>> GO TO 3.	
YET >> Perform DTC CONFIRMATION PROCEDURE again. GO TO 1.	L
3.PERFORM DTC CONFIRMATION PROCEDURE-II	
Check 1st trip DTC. <u>Is 1st trip DTC detected?</u>	M
YES >> Go to <u>EC-376, "Diagnosis Procedure"</u> . NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-41, "Intermittent Incident"</u> . NO-2 >> Confirmation after repair: INSPECTION END	Ν
4.PERFORM DTC CONFIRMATION PROCEDURE	\bigcirc
 With GST Start engine and wait engine 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. 	P
4. Check 1st trip DTC. <u>Is 1st trip DTC detected?</u>	
YES >> Go to <u>EC-376</u> , " <u>Diagnosis Procedure</u> ". NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-41</u> , " <u>Intermittent Incident</u> ". NO-2 >> Confirmation after repair: INSPECTION END	

< DTC/CIRCUIT DIAGNOSIS >

Diagnosis Procedure

1.CHECK FUEL FILLER CAP DESIGN

- 1. Turn ignition switch OFF.
- 2. Check for genuine NISSAN fuel filler cap design.
- Is the inspection result normal?
- YES >> GO TO 2.
- NO >> Replace with genuine NISSAN fuel filler cap.



2.CHECK FUEL FILLER CAP INSTALLATION

Check that the cap is tightened properly by rotating the cap clockwise.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Open fuel filler cap, then clean cap and fuel filler neck threads using air blower. Then retighten until ratcheting sound is heard.

3.CHECK FUEL FILLER CAP FUNCTION

Check for air releasing sound while opening the fuel filler cap.

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4.CHECK FUEL TANK VACUUM RELIEF VALVE

Refer to EC-379, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace fuel filler cap with a genuine one.

5.CHECK FOR EVAP LEAK

Refer to EC-583, "Work Procedure".

Is there any leak in EVAP line?

YES >> Repair or replace.

NO >> GO TO 6.

6.CHECK EVAP CANISTER VENT CONTROL VALVE

Check the following.

- EVAP canister vent control valve is installed properly. Refer to <u>FL-18, "Removal and Installation"</u>.
- EVAP canister vent control valve. Refer to <u>EC-356, "Component Inspection"</u>.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace EVAP canister vent control valve and O-ring.

7.CHECK IF EVAP CANISTER SATURATED WITH WATER

INFOID:000000011939865

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

1. Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached. А Check if water will drain from the EVAP canister. 2. Does water drain from EVAP canister? EVAP canister YES >> GO TO 8. EC NO-1 >> With CONSULT: GO TO 10. NO-2 >> Without CONSULT: GO TO 11. Water EVAP canister vent control valve JMBIA1134GB D 8.CHECK EVAP CANISTER Weigh the EVAP canister assembly with the EVAP canister vent control valve and EVAP control system pressure sensor attached. Ε 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 Н >> Repair hose or replace EVAP canister. 10. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION 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. Touch "Qu" on CONSULT screen to increase "PURG VOL CONT/V" opening to 100%. 4 5. Check vacuum hose for vacuum. Κ 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 M Without CONSULT 1. Start engine and warm it up to normal operating temperature. Ν 2. Stop engine. Disconnect vacuum hose to EVAP canister purge volume control solenoid valve at EVAP service port. Start engine and let it idle for at least 80 seconds. 5. Check vacuum hose for vacuum when revving engine up to 2,000 rpm. Vacuum should exist. Ρ Is the inspection result normal? YES >> GO TO 13. NO >> GO TO 12.

12.CHECK VACUUM HOSE

Check vacuum hoses for clogging or disconnection. Refer to <u>EC-46, "EVAPORATIVE EMISSION SYSTEM :</u> <u>System Description"</u>.

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 13.

NO >> Repair or reconnect the hose.

13. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-351, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 14.

NO >> Replace EVAP canister purge volume control solenoid valve.

14.CHECK FUEL TANK TEMPERATURE SENSOR

Refer to EC-302, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 15.

NO >> Replace fuel level sensor unit.

15. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-365, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 16.

NO >> Replace EVAP control system pressure sensor.

16.CHECK EVAP PURGE LINE

Check EVAP purge line (pipe, rubber tube, fuel tank and EVAP canister) for cracks or improper connection. Refer to <u>EC-46</u>, <u>"EVAPORATIVE EMISSION SYSTEM : System Description"</u>.

Is the inspection result normal?

YES >> GO TO 17.

NO >> Repair or reconnect the hose.

17.CLEAN EVAP PURGE LINE

Clean EVAP purge line (pipe and rubber tube) using air blower.

>> GO TO 18.

18.CHECK EVAP/ORVR LINE

Check EVAP/ORVR line between EVAP canister and fuel tank for clogging, kink, looseness and improper connection. For location, refer to <u>EC-32, "On Board Refueling Vapor Recovery (ORVR)"</u>.

Is the inspection result normal?

YES >> GO TO 19.

NO >> Repair or replace hoses and tubes.

19.CHECK RECIRCULATION LINE

Check recirculation line between fuel filler tube and fuel tank for clogging, kink, cracks, looseness and improper connection.

Is the inspection result normal?

YES >> GO TO 20.

NO >> Repair or replace hose, tube or fuel filler tube.

20.CHECK REFUELING EVAP VAPOR CUT VALVE

Refer to EC-564. "Component Inspection".

Is the inspection result normal?

YES >> GO TO 21.

NO >> Replace refueling EVAP vapor cut valve with fuel tank.

21. CHECK FUEL LEVEL SENSOR

Refer to MWI-55, "Component Inspection".

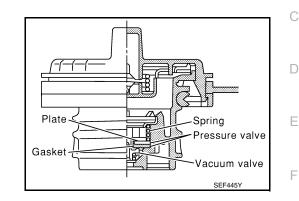
Is the inspection result normal?

< DTC/CIRCUIT DIAGNOSIS >

YES >> INSPECTION END NO >> Replace fuel level sensor unit.

Component Inspection

- **1.**CHECK FUEL FILLER CAP
- 1. Turn ignition switch OFF.
- Remove fuel filler cap. Refer to <u>FL-10, "Exploded View"</u>.
- 3. Wipe clean valve housing.



Vacuum/Pressure gauge

One-way valve

- Fuel filler

LFuel filler cap adapter

cap

1

- 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 (0.153 – 0.2 bar, 0.156 – 0.204 kg/cm², 2.22 - 2.90 psi) Vacuum: -6.0 to -3.3 kPa (-0.06 to -0.033 bar, -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 FL-10, "Exploded View".

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

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Pressure

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P0460 FUEL LEVEL SENSOR

DTC Description

INFOID:000000011939867

IVQ35DE1

DTC DETECTION LOGIC

When the vehicle is parked, the fuel level in the fuel tank is naturally stable. It means that output signal of the fuel level sensor does not change. If ECM senses sloshing signal from the sensor, fuel level sensor malfunction is detected.

Even though the vehicle is parked, a signal being varied is sent from the fuel level sensor to ECM.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
		Diagnosis condition	Start engine and let it idle	
	FUEL LEV SEN SLOSH (Fuel level sensor "A" circuit)	Signal (terminal)	Voltage signal transmitted from Fuel level sensor to ECM	
P0460		Threshold	Even though the vehicle is parked, a signal being varied is sent from the fuel level sensor to ECM	
		Diagnosis delay time	—	

POSSIBLE CAUSE

- 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

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0460 is displayed with DTC UXXXX or P0607, first perform the confirmation procedure for DTC UXXXX or P0607.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable.
 - DTC UXXXX: Refer to <u>EC-107, "DTC Index"</u>.
 - DTC P0607: Refer to <u>EC-419</u>, "DTC Description".
- NO >> GO TO 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.

>> GO TO 3.

3. 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-381, "Diagnosis Procedure".

- NO-1 >> To check malfunction symptom before repair: Refer to GI-41. "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

EC-380

Diagnosis Procedure 1.check dtc priority

< DTC/CIRCUIT DIAGNOSIS >

If DTC P0460 is displayed with DTC UXXXX or P0607, first perform the confirmation procedure for DTC UXXXX or P0607.	EC
Is applicable DTC detected?	
 YES >> Perform diagnosis of applicable. DTC UXXXX: Refer to <u>EC-107, "DTC Index"</u>. DTC P0607: Refer to <u>EC-419, "DTC Description"</u>. 	С
NO >> GO TO 2.	_
2. CHECK COMBINATION METER FUNCTION	D
Check combination meter function. Refer to MWI-20, "CONSULT Function (METER/M&A)".	-
Is the inspection result normal?	E
YES >> INSPECTION END	
NO >> Proceed to <u>MWI-59, "Diagnosis Procedure"</u> .	
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[VQ35DE]

INFOID:000000011939868

P0461 FUEL LEVEL SENSOR

DTC Description

INFOID:000000011939869

[VQ35DE]

DTC DETECTION LOGIC

Driving long distances naturally affect fuel gauge level.

This diagnosis detects the fuel gauge malfunction of the gauge not moving even after a long distance has been driven.

The output signal of the fuel level sensor does not change within the specified range even though the vehicle has been driven a long distance.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
		Diagnosis condition	—	
		Signal (terminal)	Voltage signal transmitted from fuel level sen- sor to ECM	
P0461	FUEL LEVEL SENSOR (Fuel level sensor "A" circuit range/per- formance)	Threshold	The output signal of the fuel level sensor does not change within the specified range even though the vehicle has been driven a long distance	
		Diagnosis delay time	—	

POSSIBLE CAUSE

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

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0461 is displayed with DTC UXXXX or P0607, first perform the confirmation procedure for DTC UXXXX or P0607.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable.

- DTC UXXXX: Refer to <u>EC-107, "DTC Index"</u>.
- DTC P0607: Refer to <u>EC-419</u>, "DTC Description".

NO >> GO TO 2.

2. PRECONDITIONING

WARNING:

When performing the following procedure, always observe the handling of the fuel. Refer to <u>FL-2</u>, <u>"General Precaution"</u>.

TESTING CONDITION:

Before starting component function check, preparation of draining fuel and refilling fuel is required.

Will CONSULT be used?

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

3. PERFORM COMPONENT FUNCTION CHECK

(B) With CONSULT NOTE:

< DTC/CIRCUIT DIAGNOSIS >	[VQ35DE]
 Start from step 10, if it is possible to confirm that the fuel cannot be drained by 30 l (7-7/8 l 8 lmp gal) in advance. Prepare a fuel container and a spare hose. Release fuel pressure from fuel line, refer to EC-583, "Work Procedure". 	US gal, 6-5/ A
 Remove the fuel feed hose on the fuel level sensor unit. Connect a spare fuel hose where the fuel feed hose was removed. Turn ignition switch OFF and wait at least 10 seconds then turn ON. Select "FUEL LEVEL SE" in "DATA MONITOR" mode with CONSULT. Check "FUEL LEVEL SE" output voltage and note it. 	EC
 Select "FUEL PUMP RELAY" in "ACTIVE TEST" mode with CONSULT. Touch "ON" and drain fuel approximately 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal) and stop it. 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. 	D
 Check "FUEL LEVEL SE" output voltage and note it. Confirm whether the voltage changes more than 0.03 V during step 7 to 10 and 10 to 12. 	E
<u>Is the inspection result normal?</u> YES-1 >> To check malfunction symptom before repair: Refer to <u>GI-41, "Intermittent Incident"</u> . YES-2 >> Confirmation after repair: INSPECTION END NO >> Proceed to <u>EC-383, "Diagnosis Procedure"</u> .	F
4. 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 Imp gal) in advance. Prepare a fuel container and a spare hose. Release fuel pressure from fuel line. Refer to EC-168, "Work Procedure". Remove the fuel feed hose on the fuel level sensor unit. Refer to FL-5, "Removal and Installat 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. Confirm that the fuel gauge indication varies. Fill fuel into the fuel tank for 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal). Confirm that the fuel gauge indication varies. Is the inspection result normal? YES-1 >> To check malfunction symptom before repair: Refer to GI-41, "Intermittent Incident". YES-2 >> Confirmation after repair: INSPECTION END NO => Proceed to EC-383, "Diagnosis Procedure". 	<u>ion"</u> . I J
1. CHECK DTC PRIORITY	OID:000000011939870
If DTC P0461 is displayed with DTC UXXXX or P0607, first perform the confirmation procedu UXXXX or P0607.	Ire for DTC
Is applicable DTC detected?	Ν
 YES >> Perform diagnosis of applicable. DTC UXXXX: Refer to <u>EC-107, "DTC Index"</u>. DTC P0607: Refer to <u>EC-419, "DTC Description"</u>. NO >> GO TO 2. 	C
2. CHECK COMBINATION METER FUNCTION	
Check combination meter function. Refer to <u>MWI-20, "CONSULT Function (METER/M&A)"</u> .	P
Is the inspection result normal?	
YES >> INSPECTION END	

NO >> Proceed to <u>MWI-59, "Diagnosis Procedure"</u>.

P0462, P0463 FUEL LEVEL SENSOR

DTC Description

INFOID:000000011939871

[VQ35DE]

DTC DETECTION LOGIC

- An excessively low voltage from the sensor is sent to ECM.
- An excessively high voltage from the sensor is sent to ECM.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
		Diagnosis condition	Ignition switch ON
D0462	FUEL LEVL SEN/CIRC	Signal (terminal)	Voltage signal transmitted from fuel level sen- sor to ECM
P0462	(Fuel level sensor "A" circuit low)	Threshold	An excessively low voltage from the sensor is sent to ECM
		Diagnosis delay time	—
		Diagnosis condition	Ignition switch ON
P0463	FUEL LEVL SEN/CIRC	Signal (terminal)	Voltage signal transmitted from fuel level sen- sor to ECM
	(Fuel level sensor "A" circuit high)	Threshold	An excessively high voltage from the sensor is sent to ECM
		Diagnosis delay time	—

POSSIBLE CAUSE

DTC P0462

- · 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 P0463

- 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

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0462 or P0463 is displayed with DTC UXXXX or P0607, first perform the confirmation procedure for DTC UXXXX or P0607.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable.

- DTC UXXXX: Refer to EC-107, "DTC Index".
- DTC P0607: Refer to EC-419, "DTC Description".

NO >> GO TO 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.

DOAGO DOAGO ELLEL LEVEL SENSOD

PU402, PU403 FUEL LEVEL SENSOR		
< DTC/CIRCUIT DIAGNOSIS >	[VQ35DE]	
 Turn ignition switch ON. Turn ignition switch OFF and wait at least 10 seconds. TESTING CONDITION: Before performing the following procedure, confirm that battery voltage is more than 11 	V at ignition	А
switch ON.		EC
>> GO TO 3.		
3.PERFORM DTC CONFIRMATION PROCEDURE		С
1. Turn ignition switch ON and wait at least 5 seconds.		
2. Check 1st trip DTC. Is 1st trip DTC detected?		D
YES >> Proceed to <u>EC-385, "Diagnosis Procedure"</u> . NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-41, "Intermittent Incident"</u> . NO-2 >> Confirmation after repair: INSPECTION END		Е
Diagnosis Procedure	INFOID:0000000011939872	
1. CHECK DTC PRIORITY		F
If DTC P0462 or P0463 is displayed with DTC UXXXX or P0607, first perform the confirmation	nrocedure for	
DTC UXXXX or P0607.		G
Is applicable DTC detected?		
 YES >> Perform diagnosis of applicable. DTC UXXXX: Refer to <u>EC-107, "DTC Index"</u>. DTC P0607: Refer to <u>EC-419, "DTC Description"</u>. 		Н
NO >> GO TO 2. 2.CHECK COMBINATION METER FUNCTION		
Check combination meter function. Refer to <u>MWI-20, "CONSULT Function (METER/M&A)"</u> .		
Is the inspection result normal?		
YES >> INSPECTION END		J
NO >> Proceed to <u>MWI-59. "Diagnosis Procedure"</u> .		
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P0500 VSS

Description

ECM receives vehicle speed signals from two different paths via CAN communication line: One is from the ABS actuator and electric unit (control unit) via the combination unit and the other is from TCM.

DTC Description

INFOID:000000011939874

INFOID:000000011939873

DTC DETECTION LOGIC

At 20 km/h (13 MPH), ECM detects the following status continuously for 5 seconds or more: The difference between a vehicle speed calculated by a output speed sensor transmitted from TCM to ECM via CAN communication and the vehicle speed indicated on the combination meter exceeds 15 km/h (10 MPH).

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
		Diagnosis condition	Start engine and shift the selector lever to D range and drive the vehicle at least 5 seconds at 20 km/h (13 MPH) or more
		Signal (terminal)	-
P0500	VEH SPEED SEN/CIRC (Vehicle speed sensor "A")	Threshold	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 output speed sensor transmitted from TCM to ECM via CAN com- munication and the vehicle speed indicated on the combination meter exceeds 15 km/h (10 MPH)
		Diagnosis delay time	—

POSSIBLE CAUSE

Harness or connector

(The CAN communication line is open or shorted.)

- Combination meter
- ABS actuator and electric unit (control unit)
- · Wheel sensor
- TCM
- Output speed sensor

FAIL-SAFE

Engine operating condition in fail-safe mode			
Fail safe mode Vehicle behavior			
Vehicle speed sensor The cooling fan operates (Highest) while engine is running.			

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0500 is displayed with DTC UXXXX or P0607, first perform the confirmation procedure for DTC UXXXX or P0607.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable.

- DTC UXXXX: Refer to EC-107. "DTC Index".
- DTC P0607: Refer to <u>EC-419, "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.

P0500 VSS

< DTC/CIRCUIT DIAGNOSI	IS >	[VQ35DE]
	and wait at least 10 seconds.	
 Turn ignition switch ON. Turn ignition switch OFF 	and wait at least 10 seconds.	
ESTING CONDITION:		
sefore performing the follo	owing procedure, confirm that battery voltage is 10 V o	or more at idle.
>> GO TO 3.		I
B. PERFORM DTC CONFIRI	MATION PROCEDURE	
. Start engine.		
	D D range and wait at least for 2 seconds.	
CAUTION:	t 5 seconds at 20 km/h (13 MPH) or more.	
Always drive vehicle at NOTE:	t a safe speed.	
_	conducted with the drive wheels lifted in the shop or by	driving the vehicle. If a
	be easier, it is unnecessary to lift the vehicle.	
 Check 1st trip DTC. <u>s 1st trip DTC detected?</u> 		
YES >> Proceed to EC-3	<u>887. "Diagnosis Procedure"</u>	
	ction symptom before repair: Refer to <u>GI-41, "Intermittent</u> er repair: INSPECTION END	Incident".
	er repair. INSPECTION END	
Diagnosis Procedure		INFOID:000000011939875
CHECK DTC PRIORITY		
	with DTC UXXXX or P0607, first perform the confirmat	ion procedure for DTC
JXXXX or P0607.		
s applicable DTC detected? YES >> Perform diagno		
 DTC UXXXX: F 	Refer to <u>EC-107, "DTC_Index"</u> .	
• DTC P0607: Re	tefer to <u>EC-419, "DTC Description"</u> .	
2. CHECK DTC WITH TCM		
	to TM-42, "CONSULT Function".	
s the inspection result norma		
YES >> GO TO 3.	ale active a value of the DTO is disposed	
	shooting relevant to DTC indicated. ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)	
		NIII T. Function" (without
CC), <u>BRC-212, "CONSULT F</u>	or and electric unit (control unit). Refer to <u>BRC-41, "CONS</u> Function" (with ICC).	
s the inspection result norma		
YES >> GO TO 4.	shooting relevant to DTC indicated	
NO >> Perform trouble s 1. CHECK DTC WITH COME	shooting relevant to DTC indicated.	
		<u>//2 // \''</u>
s the inspection result norma	n meter. Refer to <u>MWI-20, "CONSULT Function (METER/N</u> al?	<u>/IQA)</u> .
YES >> GO TO 5.		
NO >> Perform trouble s	shooting relevant to DTC indicated.	
5.CHECK OUTPUT SPEED) SENSOR	

YES >> GO TO 6.

NO >> Replace or replace error-detected parts.

 $6. {\sf CHECK} \text{ wheel sensor}$

Check wheel sensor. Refer to BRC-71, "Diagnosis Procedure", BRC-76, "Diagnosis Procedure".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace or replace error-detected parts.

P0506 ISC SYSTEM

Description

INFOID:000000011939876

INFOID:000000011939877

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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 Description

DTC DETECTION LOGIC

The idle speed is less than the target idle speed by 100 rpm or more.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
		Diagnosis condition	Start engine and let it idle	(
P0506 ISC SYSTEM (Idle air control system RPM lower than expected)	Signal (terminal)	—	-	
	Threshold	The idle speed is less than the target idle speed by 100 rpm or more	-	
	Diagnosis delay time	_	-	

POSSIBLE CAUSE

Electric throttle control actuator

Intake air leakage

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0506 is displayed with other DTC, first perform the trouble diagnosis for the other DTC.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to EC-107. "DTC Index".

NO >> GO TO 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.

If the target idle speed is out of the specified value, perform Idle Air Volume Learning (Refer to <u>EC-160.</u> C <u>"Description"</u>), before conducting DTC CONFIRMATION PROCEDURE. TESTING CONDITION:

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

• Always perform the test at a temperature above -10°C(14°F).

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

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

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

P0506 ISC SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

3. Turn ignition switch ON.

- 4. Turn ignition switch OFF and wait at least 10 seconds.
- 5. Restart engine and run it for at least 1 minute at idle speed.
- 6. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to EC-390, "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:000000011939878

1.CHECK DTC PRIORITY

If DTC P0506 is displayed with other DTC, first perform the trouble diagnosis for the other DTC. <u>Is applicable DTC detected?</u>

YES >> Perform diagnosis of applicable. Refer to <u>EC-107, "DTC Index"</u>.

NO >> GO TO 2.

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-586, "Removal and Installation".

P0507 ISC SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

P0507 ISC SYSTEM

Description

INFOID:0000000011939879

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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 Description

INFOID:000000011939880

DTC DETECTION LOGIC

The idle speed is more than the target idle speed by 200 rpm or more.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
		Diagnosis condition	Start engine and let it idle	G
P0507 ISC SYSTEM (Idle air control system RPM higher than expected)	Signal (terminal)	-		
	Threshold	The idle speed is more than the target idle speed by 200 rpm or more	F	
		Diagnosis delay time	—	
POSSIBLE	CAUSE	1		

•	Electric	throttle	control	actuator
---	----------	----------	---------	----------

- Intake air leakage
- PCV system

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0507is displayed with other DTC, first perform the trouble diagnosis for the other DTC.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to EC-107, "DTC Index".
- NO >> GO TO 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.

If the target idle speed is out of the specified value, perform Idle Air Volume Learning (Refer to <u>EC-160,</u> <u>"Description"</u>), before conducting DTC Confirmation Procedure. TESTING CONDITION:

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

• Always perform the test at a temperature above -10°C(14°F).

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

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

P0507 ISC SYSTEM

< 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. Restart engine and run it for at least 1 minute at idle speed.
- 6. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to EC-392, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1.CHECK DTC PRIORITY

If DTC P0507is displayed with other DTC, first perform the trouble diagnosis for the other DTC. <u>Is applicable DTC detected?</u>

YES >> Perform diagnosis of applicable. Refer to <u>EC-107, "DTC Index"</u>.

NO >> GO TO 2.

2. CHECK PCV HOSE CONNECTION

Confirm that PCV hose is connected correctly.

Is the inspection result normal?

- YES >> GO TO 3.
- NO >> Repair or replace malfunctioning part.

3. 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-586. "Removal and Installation".

INFOID:000000011939881

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 Description

INFOID:000000011939883

INFOID:000000011939882

DTC DETECTION LOGIC

- ECM does not control engine idle speed properly when engine is started with pre-warming up condition.
- The temperature of the catalyst inlet does not rise to the proper temperature when the engine is started with pre-warming up condition.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
		Diagnosis condition	-
		Signal (terminal)	-
COLD START CONTROL P050A (Cold start idle air control system per- formance)	Threshold	ECM does not control engine idle speed properly when engine is started with pre- warming up condition	
	Diagnosis delay time	-	
		Diagnosis condition	-
	COLD START CONTROL	Signal (terminal)	-
P050E (Cold start engine exhaust temperatur too low)	Threshold	The temperature of the catalyst inlet does not rise to the proper temperature when the en- gine is started with pre-warming up condition	
		Diagnosis delay time	—

POSSIBLE CAUSE

P050A

- Lack of intake air volume
- Fuel injection system
- ECM

P050B

- Lack of intake air volume
- Fuel injection system
- ECM

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P050A, P050E is displayed with other DTC, first perform the trouble diagnosis for the other DTC. <u>Is applicable DTC detected?</u>

YES >> Perform diagnosis of applicable. Refer to <u>EC-107</u>, "DTC Index".

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:

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P050A, P050E COLD START CONTROL

< DTC/CIRCUIT DIAGNOSIS >

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

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE-I

With CONSULT

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON.
- 3. Select "DATA MONITOR" mode with CONSULT.
- 4. Check the indication of "COOLANT TEMP/S".

With GST

Follow the procedure "With CONSULT" above.

Is the value of "COOLANT TEMP/S" between 4°C (39°F) and 36°C (97°F)?

YES >> GO TO 4.

NO-1 [If it is below 4°C (39°F)]>>Warm up the engine until the value of "COOLANT TEMP/S" reaches 4°C (39°F) or more. Retry from step 1.

NO-2 [If it is above 36°C (97°F)]>>Cool engine down to less than 36°C (97°F). Retry from step 1.

4.PERFORM DTC CONFIRMATION PROCEDURE-II

With CONSULT

- 1. Set the select lever in N range.
- Start the engine and warm up in idle with the value of "COOLANT TEMP/S" between 4°C (39°F) and 40°C (104°F) for more than 15 seconds.
- 3. Check 1st trip DTC.

With GST

Follow the procedure "With CONSULT" above.

Is 1st trip DTC detected?

YES >> Proceed to <u>EC-394. "Diagnosis Procedure"</u>. NO >> INSPECTION END

Diagnosis Procedure

1.CHECK DTC PRIORITY

If DTC P050A, P050E is displayed with other DTC, first perform the trouble diagnosis for the other DTC. <u>Is applicable DTC detected?</u>

YES >> Perform diagnosis of applicable. Refer to <u>EC-107, "DTC Index"</u>.

NO >> GO TO 2.

2.PERFORM IDLE AIR VOLUME LEARNING

Perform Idle Air Volume Learning. Refer to <u>EC-160, "Description"</u>.

Is Idle Air Volume Learning carried out successfully?

YES >> GO TO 3.

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

3. 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 4.

NO >> Repair or replace malfunctioning part

4.CHECK FUEL INJECTION SYSTEM FUNCTION

Perform DTC Confirmation Procedure for DTC P0171, P0174. Refer to <u>EC-289, "DTC Description"</u>. Is the inspection result normal?

YES >> GO TO 5.

TES ~~ GO TO 5.

Revision: October 2015

INFOID:000000011939884

P050A, P050E COLD START CONTROL

DTC/CIRCUIT DIAGNOSIS >	[VQ35DE]	
IO >> Proceed to <u>EC-291, "Diagnosis Procedure"</u> for DTC P0171, P0174.		
PERFORM DTC CONFIRMATION PROCEDURE		
Turn ignition switch ON. Erase DTC. Perform DTC Confirmation Procedure. See <u>EC-393, "DTC Description"</u> .		
he 1st trip DTC P050A, P050E displayed again? ES >> Replace ECM. Refer to <u>EC-586, "Removal and Installation"</u> . O >> INSPECTION END		

P0520 EOP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P0520 EOP SENSOR

DTC Description

INFOID:000000011939885

[VQ35DE]

DTC DETECTION LOGIC

- 1. A voltage signal transmitted from the engine oil pressure sensor is lower than 0.26 V.
- 2. A voltage signal transmitted from the engine oil pressure sensor is higher than 4.9 V.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
			Diagnosis condition	Start engine and let it idle
	1	Signal (terminal)	Voltage signal transmitted from engine oil pressure sensor to ECM	
			Threshold	A voltage signal transmitted from the engine oil pressure sensor is lower than 0.26 V
P0520	EOP SENSOR/SWITCH (Engine oil pressure sensor/switch		Diagnosis delay time	5 seconds or more
F0320	circuit)		Diagnosis condition	Start engine and let it idle
			Signal (terminal)	Voltage signal transmitted from engine oil pressure sensor to ECM
		2	Threshold	A voltage signal transmitted from the engine oil pressure sensor is higher than 4.9 V
			Diagnosis delay time	5 seconds or more

POSSIBLE CAUSE

- Harness or connectors (EOP sensor circuit is open or shorted) (APP sensor 2 circuit is shorted.) [Battery current sensor circuit is shorted.]
 [CMP sensor (PAHSE) circuit is open or shorted.] (Refrigerant pressure sensor is shorted.)
- Engine oil temperature (EOP) sensor
- Accelerator pedal position sensor (APP sensor 2)
- Camshaft position (CMP) sensor (PHESE)
- Refrigerant pressure sensor

FAIL-SAFE

Not applicable

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. CHECK ENGINE OIL LEVEL

- 1. Turn ignition switch OFF.
- Check engine oil level. Refer to <u>LU-8, "Inspection"</u>.
- Is inspection result normal?
- YES >> GO TO 3.
- NO >> Check engine oil leak. Refer to <u>LU-8, "Inspection"</u>.

3.PERFORM DTC CONFIRMATION PROCEDURE

P0520 EOP SENSOR

1. Start engine and let it idle for at least 5 seconds. A 2. Check 1st trip DTC. Is 1st trip DTC detected? YES >> Proceed to EC-397. "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.000000011939886 C 1. CHECK EOP SENSOR POWER SUPPLY-I 1. Turn ignition switch OFF. Disconnect EOP sensor harness connector. 3. Turn ignition switch ON. 4. Check the voltage between EOP sensor harness connector terminals.
Is 1st trip DTC detected? YES >> Proceed to EC-397. "Diagnosis Procedure". NO-1 >> To check malfunction symptom before repair: Refer to GI-41. "Intermittent Incident". EC NO-1 >> To check malfunction symptom before repair: Refer to GI-41. "Intermittent Incident". EC NO-2 >> Confirmation after repair: INSPECTION END Incrust confirmation after repair: INSPECTION END C Diagnosis Procedure Incrust confirmation switch OFF. C 1. Turn ignition switch OFF. Disconnect EOP sensor harness connector. D 3. Turn ignition switch ON. 4. Check the voltage between EOP sensor harness connector terminals. E
YES >> Proceed to EC-397, "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 Import Instruction symptom before repair: Refer to GI-41, "Intermittent Incident". C 1. CHECK EOP SENSOR POWER SUPPLY-I 1. Turn ignition switch OFF. C 2. Disconnect EOP sensor harness connector. Disconnect EOP sensor harness connector terminals. 4. Check the voltage between EOP sensor harness connector terminals. E
NO-1 >> To check malfunction symptom before repair: Refer to GI-41, "Intermittent Incident". EC NO-2 >> Confirmation after repair: INSPECTION END Intermittent Incident". C Diagnosis Procedure Info.000000011939866 C 1. CHECK EOP SENSOR POWER SUPPLY-I C C 1. Turn ignition switch OFF. Disconnect EOP sensor harness connector. D 3. Turn ignition switch ON. 4. Check the voltage between EOP sensor harness connector terminals. E
Diagnosis Procedure C 1.CHECK EOP SENSOR POWER SUPPLY-I C 1. Turn ignition switch OFF. D 2. Disconnect EOP sensor harness connector. D 3. Turn ignition switch ON. E 4. Check the voltage between EOP sensor harness connector terminals. E
1. CHECK EOP SENSOR POWER SUPPLY-I C 1. Turn ignition switch OFF. Disconnect EOP sensor harness connector. 3. Turn ignition switch ON. C 4. Check the voltage between EOP sensor harness connector terminals. E
 Turn ignition switch OFF. Disconnect EOP sensor harness connector. Turn ignition switch ON. Check the voltage between EOP sensor harness connector terminals.
 Disconnect EOP sensor harness connector. Turn ignition switch ON. Check the voltage between EOP sensor harness connector terminals.
 Turn ignition switch ON. Check the voltage between EOP sensor harness connector terminals.
EOP sensor
EOP sensor
Connector (Approx.) F
F80 3 1 5 V
Is the inspection result normal?
YES >> GO TO 2.
NO >> GO TO 4. 2 CHECK FOR SENSOR SIGNAL CIRCUIT
 Turn ignition switch OFF. Disconnect ECM harness connectors.
3. Check the continuity between EOP sensor harness connector and ECM harness connector.
EOP sensor ECM
Connector Terminal Connector Terminal
F80 2 F13 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
Charle FOR sonsor Refer to FC 200, "Component Inspection"
Is the inspection result normal?
YES >> INSPECTION END
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
Connector Terminal (Approx.)

Is the inspection result normal?

3

Ground

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

F80

5 V

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	EOP sensor		ECM		
Connector	Terminal	Connector Terminal		Continuity	
F80	3	F13	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-569, "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.

EOP	EOP sensor ECM		Continuity		
Connector	Terminal	Connector Terminal		Continuity	
F80	1	F13	15	Existed	

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace error-detected parts.

7. CHECK ECM GROUND CIRCUIT

Check the continuity between ECM harness connector and ground.

ECM			Continuity	
Connector	Terminal		Continuity	
	147			
E10	149			
	152	Ground	Existed	
F12	10			
F13	55			
	105			
F14	110			

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

Component Inspection

1.CHECK EOP SENSOR

- 1. Turn ignition switch OFF.
- 2. Disconnect EOP sensor harness connector.

3. Check resistance between EOP sensor connector terminals.

P0520 EOP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

EOP	sensor			
+	_	Condition	Resistance (kΩ)	
Terr	ninal			E
1	2		4 – 10	
	3		2-8	
2	1	None	4 – 10	(
	3		1 – 3	
0	1	-	2-8	
3	2		1 – 3	

Is the inspection result normal?

YES >> INSPECTION END.

NO >> Replace EOP sensor. Refer to <u>EC-15, "ENGINE CONTROL SYSTEM : Component Parts Loca-</u> tion".

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P0524 ENGINE OIL PRESSURE

DTC Description

INFOID:000000011939888

[VQ35DE]

DTC DETECTION LOGIC

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.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
		Diagnosis condition	-	
		Signal (terminal)	Voltage signal transmitted from EOP sensor signal to ECM	
P0524	ENGINE OIL PRESSURE (Engine oil pressure too low)	Threshold	An EOP sensor signal voltage applied to ECM remains lower than the specified value continuously when the engine speed is 1,000 rpm or more	
		Diagnosis delay time	10 seconds or more	

POSSIBLE CAUSE

- · Decrease in engine oil pressure
- Decrease in engine oil level
- Engine oil condition
- EOP sensor
- Engine body

FAIL-SAFE

Engine operating condition in fail-safe mode					
Fail safe mode Vehicle behavior					
Engine oil pressure	 ECM illuminates oil pressure warning lamp on the combination meter. Engine speed will not rise more than 4,000 rpm due to the fuel cut. Fail-safe is canceled when ignition switch OFF → ON. 				

DTC CONFIRMATION PROCEDURE

CAUTION:

If "<u>EC-401, "Diagnosis Procedure"</u>" 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.

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.

P0524 ENGINE OIL PRESSURE

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

Selector lever P or N position			_			
Engine coolant tem	perature	70°C (158°F) or more		_	-	
Engine speed		1,000 rpm or more		_		
. Check DTC.		around 4,000 rpm, the p	phenomenon can	be reproduced more eas	ly.	
DTC detected	_					
	eed to <u>EC-</u> PECTION E	<u>401, "Diagnosis Procec</u> ND	<u>lure"</u> .			
.CHECK ENG	NE OIL LE	VEL				
-		er to <u>LU-8, "Inspection"</u> .				
the inspection		<u>nal?</u>				
YES >> GO ⁻ NO >> Proc		401, "Diagnosis Proced	lure".			
CHECK ENG						
With CONSUL						
. Turn ignition						
 Select "DATA Start the eng 	ine and ch	R" mode of "ENGINE" נ eck that "EOP SENSOF	R" changes, acco	rding to engine speeds.		
-						
Monitor item		Condition		Value (Approx.)		
• Selec		ngine oil temperature: 80°C (176°F) elector lever: P or N position	Engine speed: Idle	1,450 mV or more		
	Air conditioner switch: OFF Engine speed: 2 850 mV or more					
EOP SENSOR		ioner switch: OFF	Engine speed: 2,000 rpm	2,850 mV or more		
Without CONS	• No load		2,000 rpm	2,850 mV or more		
Without CONS	• No load SULT pressure.	Refer to <u>LU-8, "Inspecti</u>	2,000 rpm	2,850 mV or more		
Without CONS heck engine oil	• No load SULT pressure. result norm	Refer to <u>LU-8, "Inspecti</u> nal?	2,000 rpm on".		f "	
Without CONS heck engine oil the inspection YES-1 >> To cl YES-2 >> Cont	No load DULT pressure. result norm neck malful ïrmation af	Refer to <u>LU-8, "Inspectinal?</u> nction symptom before ter repair: INSPECTION	2,000 rpm on". repair: Refer to <u>C</u> N END	2,850 mV or more	<u>t"</u> .	
Without CONS heck engine oil the inspection YES-1 >> To cl YES-2 >> Cont	No load DULT pressure. result norm neck malful ïrmation af	Refer to <u>LU-8, "Inspectinal?</u>	2,000 rpm on". repair: Refer to <u>C</u> N END		<u>t"</u> .	
Without CONS heck engine oil the inspection YES-1 >> To cl YES-2 >> Cont NO >> Proc	• No load SULT pressure. result norm neck malfur firmation af eed to <u>EC-</u>	Refer to <u>LU-8, "Inspectinal?</u> nction symptom before ter repair: INSPECTION	2,000 rpm on". repair: Refer to <u>C</u> N END		<u>t"</u> . INFOID:000000011939889	
Without CONS heck engine oil the inspection YES-1 >> To cl YES-2 >> Conf YES-2 >> Conf NO >> Proc Diagnosis Proc	• No load BULT pressure. result norm neck malfun firmation af eed to <u>EC-</u> DCEdURE	Refer to <u>LU-8, "Inspectinal?</u> nction symptom before ter repair: INSPECTION 401, "Diagnosis Procec	2,000 rpm on". repair: Refer to <u>C</u> N END			
Without CONS heck engine oil the inspection YES-1 >> To cl YES-2 >> Cont YES-2 >> Cont NO >> Proc Viagnosis Pro	• No load SULT pressure. I result norm neck malfun rirmation af eed to <u>EC-</u> DCEdURE	Refer to <u>LU-8, "Inspectinal?</u> nction symptom before ter repair: INSPECTION 401, "Diagnosis Procec	2,000 rpm on". repair: Refer to <u>C</u> N END			
Without CONS heck engine oil the inspection YES-1 >> To cl YES-2 >> Conf YES-2 >> Conf NO >> Proc Diagnosis Proc CHECK ENG . CHECK ENG	No load DULT pressure. result norm neck malfur irmation af eed to EC- DCedure NE OIL LE switch OFI e oil level.	Refer to <u>LU-8, "Inspectinal?</u> nction symptom before ter repair: INSPECTION 401, "Diagnosis Proced VEL F. Refer to <u>LU-8, "Inspect</u> i	2,000 rpm on". repair: Refer to <u>C</u> N END <u>Jure"</u> .			
Without CONS heck engine oil the inspection YES-1 >> To cl YES-2 >> Conf NO >> Proc Diagnosis Proc CHECK ENG . Turn ignition . Check engin the inspection	No load SULT pressure. result norm neck malful irmation af eed to <u>EC-</u> DCedure NE OIL LE switch OFI e oil level. result norm	Refer to <u>LU-8, "Inspectinal?</u> nction symptom before ter repair: INSPECTION 401, "Diagnosis Proced VEL F. Refer to <u>LU-8, "Inspect</u> i	2,000 rpm on". repair: Refer to <u>C</u> N END <u>Jure"</u> .			
Without CONS heck engine oil the inspection YES-1 >> To cl YES-2 >> Cont NO >> Proc Diagnosis Pro .CHECK ENG . Turn ignition . Check engin sthe inspection YES >> GO	No load DULT pressure. result norm neck malfun irmation af eed to <u>EC-</u> DCedure NE OIL LE switch OFI e oil level. result norm TO 2.	Refer to <u>LU-8, "Inspectinal?</u> nction symptom before ter repair: INSPECTION 401, "Diagnosis Proced VEL F. Refer to <u>LU-8, "Inspect</u> i	2,000 rpm on". repair: Refer to <u>C</u> N END <u>Jure"</u> .			
Without CONS heck engine oil the inspection YES-1 >> To cl YES-2 >> Cont NO >> Proc Diagnosis Proc CHECK ENG CHECK ENG CHECK ENG CHECK engin Check engin the inspection YES >> GO NO >> GO	No load DULT pressure. result norm neck malful rimation af eed to EC- DCedure NE OIL LE switch OFI e oil level. result norm TO 2. TO 4.	Refer to <u>LU-8, "Inspectinal?</u> Inction symptom before ter repair: INSPECTION 401, "Diagnosis Proced VEL F. Refer to <u>LU-8, "Inspectional?</u>	2,000 rpm on". repair: Refer to <u>C</u> N END <u>Jure"</u> .			
Without CONS heck engine oil the inspection YES-1 >> To cl YES-2 >> Cont NO >> Proc Diagnosis Pro CHECK ENG CHECK ENG NO >> GO CHECK ENG	No load SULT pressure. result norm neck malfun irmation af eed to EC- DCedure NE OIL LE switch OFI e oil level. result norm TO 2. TO 4. NE OIL PF	Refer to <u>LU-8, "Inspectinal?</u> Inction symptom before ter repair: INSPECTION 401, "Diagnosis Proced VEL F. Refer to <u>LU-8, "Inspectional?</u>	2,000 rpm on". repair: Refer to <u>C</u> N END <u>Jure"</u> .			
Without CONS heck engine oil the inspection YES-1 >> To cl YES-2 >> Cont NO >> Proc Diagnosis Proc CHECK ENG . CHECK ENG . CHECK ENG . CHECK engin . Check engin sthe inspection YES >> GO NO >> GO	No load DULT pressure. result norm neck malfun irmation af eed to EC- DCedure NE OIL LE switch OFI e oil level. result norm TO 2. TO 4. NE OIL PF T	Refer to <u>LU-8, "Inspectinal?</u> nction symptom before ter repair: INSPECTION 401, "Diagnosis Proced VEL F. Refer to <u>LU-8, "Inspectinal?</u> RESSURE	2,000 rpm on". repair: Refer to <u>C</u> N END <u>Jure"</u> .			

P0524 ENGINE OIL PRESSURE

< DTC/CIRCUIT DIAGNOSIS >

Monitor item	Condition	Value (Approx.)				
EOP SENSOR	 Engine oil temperature: 80°C (176°F) Selector lever: P or N position 	Engine speed: Idle	1,450 mV or more			
EUP SENSOR	 Air conditioner switch: OFF No load	Engine speed: 2,000 rpm	2,850 mV or more			
Without CONS						
•	l level. Refer to <u>LU-8, "Inspection"</u> .					
Is the inspection						
YES >> GO NO >> Che	rto 3. ck oil pump. Refer to <u>LU-12, "Rem</u>	oval and Installs	ation"			
3.CHECK EOP	· · ·					
Check EOP sens	sor. Refer to <u>EC-402, "Component</u>	Inspection".				
Is the inspection	result normal?					
	PECTION END					
	air or replace error-detected parts.					
4.CHECK ENG	INE OIL LEAKAGE					
Check engine oi	l leakage. Refer to <u>LU-8, "Inspection</u>	<u>on"</u> .				
Is the inspection	result normal?					
YES >> GO	TO 5.					
NO >> Rep	>> Repair or replace error-detected parts.					

 $5. {\sf CHECK} \ {\sf CAUSE} \ {\sf OF} \ {\sf ENGINE} \ {\sf OIL} \ {\sf CONSUMPTION}$

Check the following item.

Step	Inspection item	Equipment	Standard	Reference
1	PCV valve	EC-585. "Work Procedure"		
2	Exhaust front tube	Visual	No blockingNo abnormal sounds	_
3	Oil pump	LU-12, "Removal and Ins		
4	PistonPiston pinPiston ring	 Piston to piston pin oil clearance Piston ring side clearance Piston ring end gap 		<u>EM-126</u>
5	Cylinder block	Cylinder block top surface distortion Piston to cylinder bore clearance		<u>EM-126</u>

>> Repair or replace error-detected parts.

Component Inspection

INFOID:000000011939890

1.CHECK EOP SENSOR

- 1. Turn ignition switch OFF.
- 2. Disconnect EOP sensor harness connector.
- 3. Check resistance between EOP sensor connector terminals.

P0524 ENGINE OIL PRESSURE

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

EOP s	sensor			P
+	_	Condition	Resistance (kΩ)	
Tern	ninal		((2))	EC
1	2		4 - 10	
I	3		2 - 8	
2	1	None	4 - 10	C
	3	None	1 – 3	
3	1		2-8	
	2		1 – 3	L

is the inspection result normal?

YES >> INSPECTION END.

NO >> Replace EOP sensor. Refer to <u>EC-15, "ENGINE CONTROL SYSTEM : Component Parts Loca-</u> <u>tion"</u>.

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P052A, P052B, P052C, P052D INTAKE VALVE TIMING CONTROL

< DTC/CIRCUIT DIAGNOSIS >

P052A, P052B, P052C, P052D INTAKE VALVE TIMING CONTROL

DTC Description

INFOID:000000011939891

[VQ35DE]

DTC DETECTION LOGIC

There is a gap between the target phase angle and the detected phase angle when the engine is operating in cold conditions.

DTC	CONSULT screen terms (Trouble diagnosis content)	D	TC detection condition
		Diagnosis condition	-
	CAMPULATE DODITION TIMING DA	Signal (terminal)	-
P052A	CAMSHAFT POSITION TIMING B1 (Cold start "A" camshaft position timing over-advanced bank 1)	Threshold	There is a gap between the target phase an- gle and the detected phase angle when the engine is operating in cold conditions
		Diagnosis delay time	-
		Diagnosis condition	-
	CAMSHAFT POSITION TIMING B1	Signal (terminal)	—
P052B	(Cold start "A" camshaft position timing over-retarded bank 1)	Threshold	There is a gap between the target phase an- gle and the detected phase angle when the engine is operating in cold conditions
		Diagnosis delay time	—
	CAMSHAFT POSITION TIMING B2 (Cold start "A" camshaft position timing over-advanced bank 2)	Diagnosis condition	—
		Signal (terminal)	-
P052C		Threshold	There is a gap between the target phase an- gle and the detected phase angle when the engine is operating in cold conditions
		Diagnosis delay time	—
		Diagnosis condition	-
	CAMPULATE DOCITION TIMING DO	Signal (terminal)	-
P052D	CAMSHAFT POSITION TIMING B2 (Cold start "A" camshaft position timing over-retarded bank 2)	Threshold	There is a gap between the target phase an- gle and the detected phase angle when the engine is operating in cold conditions
		Diagnosis delay time	-

POSSIBLE CAUSE

DTC P052A

- 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

DTC P052B

- 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

DTC P052C

Crankshaft position sensor

Revision: October 2015



DACA

	, P052C, P052D INTAKE VALVE TIMING CONTROL
< DTC/CIRCUIT DIAGNOSIS	S > [VQ35DE]
Accumulation of debris to thTiming chain installation	olenoid valve iate lock control solenoid valve e signal pick-up portion of the camshaft e intake valve timing control (or intermediate lock control) solenoid valve
Accumulation of debris to thTiming chain installation	olenoid valve iate lock control solenoid valve e signal pick-up portion of the camshaft e intake valve timing control (or intermediate lock control) solenoid valve
	Engine operating condition in fail-safe mode
Fail safe mode	Vehicle behavior
Intake valve timing intermediate lock control	
tion procedure for DTC UXXX <u>Is applicable DTC detected?</u> YES >> Perform diagnos • DTC P0075: Re	
TESTING CONDITION: Before performing the follow With CONSULT 1. Turn ignition switch OFF a 2. Turn ignition switch ON.	wing procedure, confirm that battery voltage is 10 V or more at idle. and wait at least 10 seconds. and wait at least 10 seconds.
•	<u>1P/S"–5°C (23°F) and 45°C (113°F)?</u>
(23°F) and 45°C (NO-2 [if it is above 45°C (113	°F)]>>Warm up the engine until the value of "COOLAN TEMP/S" indicates –5°C [113°F). And then GO TO 3. 3°F)]>>Cool the engine down to the value of "COOLAN TEMP/S" indicates –5°C [113°F). And then GO TO 3.
3.PERFORM DTC CONFIRM	IATION PROCEDURE-I
 Turn ignition switch OFF a Turn ignition switch ON. Set the selector lever in N 	

- Start the engine and let it idle for 20 seconds or more.
 Check 1st trip DTC.
- Is 1st trip DTC detected?

P052A, P052B, P052C, P052D INTAKE VALVE TIMING CONTROL

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

- YES >> Proceed to EC-406, "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:000000011939892

1.CHECK DTC PRIORITY

If DTC P052A, P052B, P052C and P052D is displayed with DTC P0075 or P0081, first perform the confirmation procedure for DTC UXXXX or P0607.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable.
 - DTC P0075: Refer to EC-213, "DTC Description".
 - DTC P0081: Refer to EC-213, "DTC Description".
- NO >> GO TO 2.

2.INSPECTION START

With CONSULT>>GO TO 3. Without CONSULT>>GO TO 4.

3.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 >> INSPECTION END

NO >> GO TO 5.

4.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</u>, "Inspection".

NO >> GO TO 6.



5. 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-408, "Component Inspection (Intake Valve Timing Intermediate Lock Control Solenoid Valve)".

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

P052A, P052B, P052C, P052D INTAKE VALVE TIMING CONTROL

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

6. CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE	Δ
Perform Component Inspection of the intake valve timing control solenoid valve. Refer to <u>EC-407</u> , "Component Inspection (Intake Valve Timing Control Solenoid Valve)".	A
Is the inspection result normal?	EC
YES >> GO TO 7.	
NO >> Repair or replace error-detected parts.	
7. CHECK CRANKSHAFT POSITION SENSOR	C
Perform Component Inspection of the crankshaft position sensor. Refer to <u>EC-409</u> , "Component Inspection <u>(Crankshaft Position sensor)</u> ".	
Is the inspection result normal?	D
YES >> GO TO 8.	
NO >> Repair or replace error-detected parts.	E
8.CHECK CAMSHAFT POSITION SENSOR	
Perform Component Inspection of the camshaft position sensor. Refer to <u>EC-409</u> , "Component Inspection (Camshaft position sensor)".	_
Is the inspection result normal?	F
YES >> GO TO 9.	
NO >> Repair or replace error-detected parts.	0
9.CHECK CAMSHAFT (INTAKE)	
Check the following. 1. Accumulation of debris on the signal plate of camshaft front end	ŀ
 Chipping signal plate of camshaft front end 	
Is the inspection result normal?	
YES >> GO TO 10. NO >> Remove debris and clean the signal plate of camshaft	
front end or replace camshaft. Refer to EM-79,	
"Removal and Installation".	L.
2 June 1	k
10.CHECK TIMING CHAIN INSTALLATION	
Check service records for any recent repairs that may cause timing chain misalignment.	
Are there any service records that may cause timing chain misalignment?	L
YES >> Check timing chain installation. Refer to EM-66, "Removal and Installation".	
NO >> GO TO 11.	Ν
11.CHECK LUBRICATION CIRCUIT	
Perform "Inspection of Camshaft Sprocket (INT) Oil Groove". Refer to <u>EM-86, "Inspection after Installation"</u> .	Ν
Is the inspection result normal?	
YES >> INSPECTION END NO >> Clean lubrication line.	
Component Inspection (Intake Valve Timing Control Solenoid Valve)	C
1. CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE-I	F
1. Turn ignition switch OFF.	
 Disconnect intake valve timing control solenoid valve harness connector. 	

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

3. Check resistance between intake valve timing control solenoid valve terminals as per the following.

	timing control id valve	Condition		D	
+	-			Resistance	
Terr	ninal				
1	2			7.0 – 7.8 Ω	
1		Temperature	20°C (68°F)	8	
2	Ground			(Continuity should not exist)	

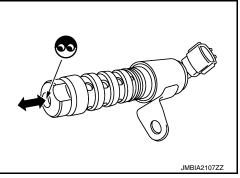
Is the inspection result normal?

- YES >> GO TO 2.
- NO >> Replace malfunctioning intake valve timing control solenoid valve. Refer to <u>EM-55</u>, "<u>Exploded</u> <u>View</u>".

2. CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE-II

- 1. Remove intake valve timing control solenoid valve. Refer to EM-55, "Exploded View".
- 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-55</u>, "<u>Exploded</u> <u>View</u>".

Component Inspection (Intake Valve Timing Intermediate Lock Control Solenoid Valve)

INFOID:000000011939894

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.

diate lock co	iming interme- ntrol solenoid Ive	Condition		Resistance
+	_			
Terminal				
1	2			7.0 – 7.8 Ω
1		Temperature	20°C (68°F)	8
2	Ground			(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-</u> <u>55, "Exploded View"</u>.

2.CHECK INTAKE VALVE TIMING INTERMEDIATE LOCK CONTROL SOLENOID VALVE-II

1. Remove intake valve timing intermediate lock control solenoid valve. Refer to EM-55, "Exploded View".

P052A, P052B, P052C, P052D INTAKE VALVE TIMING CONTROL

< DTC/CIRCUIT DIAGNOSIS >

2.

NOTE:

YES

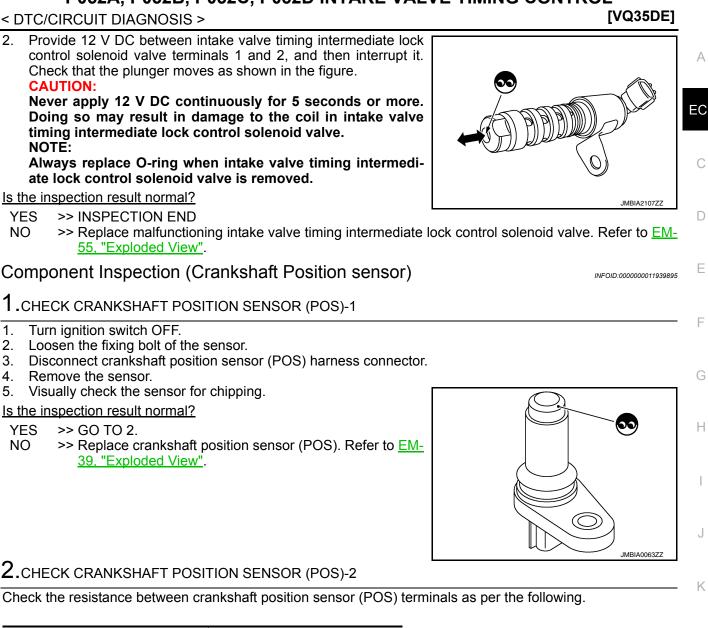
NO

1.

4.

YES

NO



Crankshaft posit	tion sensor (POS)				L
+	-	Resistance [at 25°C (77°F)]			
Terminal	(Polarity)				
1	2				M
I	3	Except 0 or $\infty \Omega$			
2	3				Ν
Is the inspection	result normal?				
	PECTION END lace crankshaft p	oosition sensor (POS). Refer to I	<u>EM-39, "Exploded View"</u> .		0
Component I	nspection (Ca	amshaft position sensor)		INFOID:000000011939896	
1. СНЕСК САМ	SHAFT POSITIC	ON SENSOR (PHASE)-1			Ρ

Turn ignition switch OFF. 1.

Loosen the fixing bolt of the sensor.

3. Disconnect camshaft position sensor (PHASE) harness connector.

4. Remove the sensor. Refer to EM-51, "Exploded View".

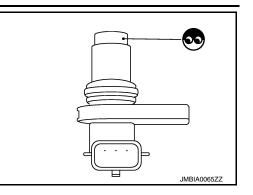
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P052A, P052B, P052C, P052D INTAKE VALVE TIMING CONTROL [VQ35DE]

- < DTC/CIRCUIT DIAGNOSIS >
- 5. Visually check the sensor for chipping.

Is the inspection result normal?

- YES >> GO TO 2.
- >> Replace camshaft position sensor (PHASE). NO



2. CHECK CAMSHAFT POSITION SENSOR (PHASE)-2

Check the resistance camshaft position sensor (PHASE) terminals as per the following.

Camshaft position sensor (PHASE)		
+	_	Resistance [Ω at 25°C (77°F)]
Terminals (Polarity)		
1	2	
I	3	Except 0 or ∞
2	3	-

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace camshaft position sensor (PHASE). Refer to EM-51, "Exploded View".

P0603, P062F ECM

< DTC/CIRCUIT DIAGNOSIS >

P0603, P062F ECM

DTC Description

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INFOID:000000011939900

DTC DETECTION LOGIC

· ECM back up system does not function properly.

• EEPROM (built-in microcomputer) system internal ECM does not function properly.

DTC	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition
		Diagnosis condition	Ignition switch ON
	ECM BACK UP/CIRCUIT	Signal (terminal)	-
P0603	[Internal Control Module Keep Alive Memory (KAM) Error]	Threshold	ECM back up system does not function prop- erly
		Diagnosis delay time	-
CONTROL MODULE P062F (Internal control module EEPROM ror)		Diagnosis condition	Start engine and let it idle
	CONTROL MODULE	Signal (terminal)	-
	(Internal control module EEPROM er- ror)	Threshold	EEPROM (built-in microcomputer) system in- ternal ECM does not function properly
		Diagnosis delay time	_

POSSIBLE CAUSE

DTC P0603

- Harness or connectors
- [ECM power supply circuit is open or shorted.]
- ECM

DTC P062F

- Harness or connectors
- [ECM power supply circuit is open or shorted.]
- ECM

FAIL-SAFE

		Engine operating condition in fail-safe mode	
DTC	Fail safe mode	Vehicle behavior	L
P0603	ECM	Engine torque may be limited.	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

Perform the following procedure before performing DTC Confirmation Procedure.

- 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 DTC P062F

- 1. Start engine and wait at least 10 seconds.
- 2. Turn ignition switch OFF and wait at least 10 seconds.
- 3. Repeat steps 1 and 2 for 4 times.
- 4. Turn ignition switch ON.
- 5. Erase DTC.
- 6. Turn ignition switch OFF and wait at least 10 seconds.
- 7. Start engine and wait at least 10 seconds.
- 8. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to EC-412, "Diagnosis Procedure".
- NO >> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE FOR DTC P0603

- 1. Turn ignition switch OFF and wait at least 10 seconds.
- 2. Turn ignition switch ON and wait at least 10 seconds.
- 3. Turn ignition switch OFF and wait at least 5 minutes.
- 4. Turn ignition switch ON and wait at least 10 seconds.
- 5. Repeat steps 3 and 4 for 5 times.
- 6. Turn ignition switch ON.
- 7. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to EC-412, "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

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 EC-586, "Removal and Installation".
- NO >> INSPECTION END

3.CHECK ECM POWER SUPPLY AND GROUND CIRCUIT

Check ECM power supply and ground circuit. Refer to EC-190. "Diagnosis Procedure".

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Repair or replace error-detected parts.

4.PERFORM DTC CONFIRMATION PROCEDURE

- 1. Turn ignition switch ON.
- 2. Erase DTC.
- 3. Perform DTC confirmation procedure. Refer to EC-411. "DTC Description".
- Is the DTC P0603 or P062F detected again?
- YES >> Replace ECM. Refer to EC-586, "Removal and Installation".
- NO >> INSPECTION END

P0604 ECM

< DTC/CIRCUIT DIAGNOSIS > P0604 ECM

DTC Description

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition	-
P0604 [ECM	Diagnosis condition	Ignition switch ON	
		Signal (terminal)	-	_
	[Internal control module random access memory (RAM) error]	Threshold	Malfunction in the internal RAM of ECM	_
		Diagnosis delay time		_

POSSIBLE CAUSE

• ECM

FAIL-SAFE

Fail safe mode	Vehicle behavior
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 Exhaust valve timing control solenoid valve Intake manifold runner control valve ASCD operation may be deactivated.

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.

L >> GO TO 2. 2. PERFORM DTC CONFIRMATION PROCEDURE Μ 1. Turn ignition switch ON (engine stopped) and wait least 20 minutes. **CAUTION:** Never start engine during this procedure. Ν 2. Turn ignition switch OFF and wait at least 10 seconds. 3. Turn ignition switch ON. Check 1st trip DTC. Ο Is 1st trip DTC detected? >> Proceed to EC-413, "Diagnosis Procedure". YES NO-1 >> To check malfunction symptom before repair: Refer to GI-41, "Intermittent Incident". Ρ NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

1.PERFORM DTC CONFIRMATION PROCEDURE

- 1. Turn ignition switch ON.
- 2. Erase DTC.
- 3. Perform DTC confirmation procedure. Refer to EC-413, "DTC Description".

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Is the 1st trip DTC P0604 displayed again?

YES >> Replace ECM. Refer to EC-586, "Removal and Installation".

NO >> INSPECTION END

P0605 ECM

< DTC/CIRCUIT DIAGNOSIS > P0605 ECM

DTC Description

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	וס	C detection condition	(
P0605 [I	ECM [Internal control module read only mem- ory (ROM) error]	Diagnosis condition	Ignition switch ON	
		Signal (terminal)	-	_
		Threshold	Malfunction in the internal ROM of ECM	- [
		Diagnosis delay time	-	_

POSSIBLE CAUSE

• ECM

FAIL-SAFE

Fail safe mode	Vehicle behavior
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 Exhaust valve timing control solenoid valve Intake manifold runner control valve ASCD operation may be deactivated.

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. Μ 2.PERFORM DTC CONFIRMATION PROCEDURE 1. Turn ignition switch ON (engine stopped) and wait least 20 minutes. Ν **CAUTION:** Never start engine during this procedure. 2. Turn ignition switch OFF and wait at least 10 seconds. 3. Turn ignition switch ON. Ο 4. Check 1st trip DTC. Is 1st trip DTC detected? YES >> Proceed to EC-415, "Diagnosis Procedure". Ρ NO-1 >> To check malfunction symptom before repair: Refer to GI-41, "Intermittent Incident". NO-2 >> Confirmation after repair: INSPECTION END **Diagnosis** Procedure INFOID:000000011939905 **1.INSPECTION START** 1. Turn ignition switch ON.



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- 2. Erase DTC.
- 3. Perform DTC CONFIRMATION PROCEDURE. See <u>EC-415</u>, "DTC Description".

Is the 1st trip DTC P0605 displayed again?

YES >> Replace ECM. Refer to EC-586, "Removal and Installation".

NO >> INSPECTION END

P0606 ECM

< DTC/CIRCUIT DIAGNOSIS >

P0606 ECM

DTC Description

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
		Diagnosis condition	-	
P0606 CONTROL MODULE (Control module processor	CONTROL MODULE	Signal (terminal)	-	
	(Control module processor)	Threshold	Malfunction in ECM processor	
		Diagnosis delay time	—	

POSSIBLE CAUSE

ECM

FAIL-SAFE

Fail safe mode	Vehicle behavior
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 Exhaust valve timing control solenoid valve Intake manifold runner control valve ASCD operation may be deactivated.

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. Μ 2.PERFORM DTC CONFIRMATION PROCEDURE-I 1. Turn ignition switch ON (engine stopped) and wait at least 10 seconds. Ν **CAUTION:** Never start engine during this procedure. 2. Turn ignition switch OFF and wait at least 10 seconds. 3. Turn ignition switch ON. Ο 4. Check 1st trip DTC. Is 1st trip DTC detected? YES >> Proceed to EC-418, "Diagnosis Procedure". Ρ NO >> GO TO 3. 3.PERFORM DTC CONFIRMATION PROCEDURE-II

1. Start engine.

- 2. Rev up the engine quickly to approximately 3,000 rpm under unloaded condition and completely release the accelerator pedal.
- Let the engine idle and wait at least 10 seconds. 3.

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

- 5. Turn ignition switch ON.
- 6. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to EC-418, "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:000000011939907

1.PERFORM DTC CONFIRMATION PROCEDURE

- 1. Turn ignition switch ON.
- 2. Erase DTC.
- 3. Perform DTC confirmation procedure for 3 times. Refer to EC-417, "DTC Description".

Is the 1st trip DTC P0606 displayed again?

- YES >> Replace ECM. Refer to EC-586, "Removal and Installation".
- NO >> INSPECTION END

< DTC/CIRCUIT DIAGNOSIS > P0607 ECM

DTC Description

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition	С
		Diagnosis condition	Ignition switch ON	
	ECM	Signal (terminal)		
P0607 (Control module performance)	Threshold	ECM internal communication system is mal- functioning	D	
		Diagnosis delay time		_

POSSIBLE CAUSE

• ECM

FAIL-SAFE

Engine operating condition in fail-safe mode		
Fail safe mode Vehicle behavior		G
ECM	Engine torque may be limited.	

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 $^{-\mathrm{J}}$ switch ON.

>> GO TO 2. 2.PERFORM DTC CONFIRMATION PROCEDURE		К
 Turn ignition switch ON (engine stopped) and wait least 10 seconds. Turn ignition switch OFF and wait at least 10 seconds. Turn ignition switch ON. Check 1st trip DTC. 		L
Is 1st trip DTC detected?		M
 YES >> Proceed to <u>EC-419. "Diagnosis Procedure"</u>. NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-41. "Intermittent Incident"</u>. NO-2 >> Confirmation after repair: INSPECTION END 		Ν
Diagnosis Procedure	INFOID:0000000011939909	
1.PERFORM DTC CONFIRMATION PROCEDURE		0

1. Turn ignition switch ON.

- 2. Erase DTC.
- 3. Perform DTC confirmation procedure. Refer to EC-419, "DTC Description".
- Is the 1st trip DTC P0607 displayed again?
- YES >> Replace ECM. Refer to EC-586, "Removal and Installation".
- NO >> INSPECTION END

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< DTC/CIRCUIT DIAGNOSIS > P060A ECM

DTC Description

	INFOID:000000011939910

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
		Diagnosis condition	Ignition switch ON
P060A	CONTROL MODULE (Internal control module monitoring pro- cessor performance)	Signal (terminal)	_
		Threshold	ECM internal monitoring processor is mal- functioning
		Diagnosis delay time	—

POSSIBLE CAUSE

• ECM

FAIL-SAFE

Engine operating condition in fail-safe mode		
Fail safe mode	Vehicle behavior	
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 Exhaust valve timing control solenoid valve Intake manifold runner control valve Engine torque may be limited. ASCD operation may be deactivated. 	

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.
- 3. Repeat step 1 and 2 for 5 times.
- 4. Turn ignition switch ON.
- 5. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to EC-420, "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

1.PERFORM DTC CONFIRMATION PROCEDURE

P060A ECM

< DTC/CIRCUIT DIAGNOSIS >	[VQ35DE]	
 Turn ignition switch ON. Erase DTC. Perform DTC confirmation procedure. Refer to <u>EC-420, "DTC Description"</u>. Is the 1st trip DTC P060A displayed again? 		А
YES >> Replace ECM. Refer to <u>EC-586, "Removal and Installation"</u> . NO >> INSPECTION END		EC
		С
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		Ρ

< DTC/CIRCUIT DIAGNOSIS > P060B ECM

DTC Description

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
		Diagnosis condition	Ignition switch ON
P060B	CONTROL MODULE (Internal control module A/D processing performance)	Signal (terminal)	
		Threshold	ECM internal analog/digital conversion pro- cessing system is malfunctioning
		Diagnosis delay time	

POSSIBLE CAUSE

• ECM

FAIL-SAFE

Engine operating condition in fail-safe mode		
Fail safe mode	Vehicle behavior	
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 Exhaust valve timing control solenoid valve Intake manifold runner control valve ASCD operation may be deactivated. 	

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-422, "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

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.

2. Erase DTC.

INFOID:000000011939913

P060B ECM

< DTC/CIRCUIT DIAGNOSIS >	[VQ35DE]
3. Perform DTC confirmation procedure. Refer to EC-422, "DTC Description".	
Is the 1st trip DTC P060B displayed again?	A
YES >> Replace ECM. Refer to <u>EC-586, "Removal and Installation"</u> . NO >> INSPECTION END	
	EC
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P0643 SENSOR POWER SUPPLY

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
- Battery current sensor

NOTE:

If sensor power supply 1 circuit is malfunctioning, DTC P0643 is displayed.

Sensor power supply 2

- Accelerator pedal position (APP) sensor 2
- Camshaft position (CMP) sensor (PHASE)
- Engine oil pressure (EOP) sensor
- Refrigerant pressure sensor

DTC Description

INFOID:000000011939915

DTC DETECTION LOGIC

ECM detects a voltage of power source for sensor is excessively low or high

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition				
		Diagnosis condition	Start engine and let it idle			
P0643	SENSOR POWER/CIRC (Sensor reference voltage "A" circuit high)	Signal (terminal)	Sensor power supply 1 circuit			
		Threshold	ECM detects a voltage of power source for sensor is excessively low or high			
		Diagnosis delay time	—			

POSSIBLE CAUSE

- · Sensor power supply 1 circuit
- 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
- Battery current sensor

FAIL-SAFE

Engine operating condition in fail-safe mode							
Fail safe mode Vehicle behavior							
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 Exhaust valve timing control solenoid valve Intake manifold runner control valve 						

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

P0643 SENSOR POWER SUPPLY

< DTC/CIR					NOUFFLI		[VQ35DE]
				reviously conduc	ted, always perfor	m the following	
before cond	ucting the ne	ext test	t.	-			,
	nition switch		nd wait at least	10 seconds.			
3. Turn ign	nition switch		nd wait at least	10 seconds.			
TESTING C		follow	ving procedure	confirm that he	ittery voltage is m	oro than 9 V at	
Delore peri	orning the	TOHOW	ing procedure	, commin that be	illery voltage is in		iule.
>>	GO TO 2.						
2.PERFOR		NFIRM	ATION PROCE	DURE			
1. Start the	e engine and	l let it i	dle for 1 second	J.			
2. Check E							
Is DTC dete				e e e el une ll			
			5. "Diagnosis P ion symptom be		to <u>GI-41, "Intermit</u>	tent Incident".	
			repair: INSPEC				
Diagnosis	s Procedu	re				INF	OID:0000000011939916
	SENSOR PO						
			SUPPLY 1				
	nition switch nect ECM ha		connector				
3. Turn igr	nition switch	ON.					
4. Check t	he voltage b	etwee	n ECM harness	connector and gi	round.		
	+						
	ECM		_	Voltage			
Connector		nal		(Approx.)			
E10	146						
F13	28			- > /			
E14	87	•	Ground	5 V			
F14	98						
Is the inspec	ction result n	ormal	?				
	INSPECTIO GO TO 2.	N END)				
-			SUPPLY 1 CIR	CUUT			
			SUFFLI I CIR	CON			
	nition switch nect following		or harness conr	nector.			
					he following termin	nals.	
	CM			Sensor			
Connector	Terminal	400		ame	Connector	Terminal	
E10	146		ensor 1		E40	4	
		MAF	sensor (POS)		F30 F31	1	
F13	28		control position sen	sor (bank 1)	F31 F82	1	
			control position sens		F81	1	
	87		y current sensor		F5	1	
F14	98	TP se			F57	5	
			~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~		,	~	

Is the inspection result normal?

YES >> GO TO 3.

P0643 SENSOR POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

NO >> Repair or replace error-detected parts.

3. CHECK COMPONENTS

Check the following.

- Accelerator pedal position (APP) sensor 1 (Refer to <u>EC-513, "Component Inspection"</u>.)
 Crankshaft position (CKP) sensor (POS) (Refer to <u>EC-328, "Component Inspection"</u>.)
- · Exhaust valve timing (EVT) control position sensor [Refer to EC-205, "Component Inspection (Exhaust Valve Timing Control Position Sensor)"]
- Mass air flow (MAF) sensor (Refer to <u>EC-223, "Component Inspection"</u>.)
 Throttle position (TP) sensor (Refer to <u>EC-243, "Component Inspection"</u>.)
 Battery current sensor (Refer to <u>EC-445, "Component Inspection"</u>.)

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Replace malfunctioning component.

P0850 PNP SWITCH

Description

When the selector lever position is P or N, park/neutral position (PNP) signal from the transmission range switch is sent to ECM.

DTC Description

DTC DETECTION LOGIC

The signal of the park/neutral position (PNP) signal does not change during driving after the engine is started.

DTC	CONSULT screen t (Trouble diagnosis co			DTC detection condition
			Diagnosis condition	—
	P-N POS SW/CIRCUIT		Signal (terminal)	The park/neutral position (PNP) signal circuit
P0850	(Park/Neutral switch input	circuit)	Threshold	The signal does not change during driving af- ter the engine is started
			Diagnosis delay time	—
[The park • TCM	or connectors <td>signal circu</td> <td>it is open or shorted.]</td> <td></td>	signal circu	it is open or shorted.]	
FAIL-SAFI Not applica				
	IFIRMATION PROCED	URE		
	TION START			
	ULT be used?			
	ULT be used?			
	> GO TO 2.			
~	> GO TO 5. NDITIONING			
			viously conducted alw	ays perform the following before conduct
ing the nex	t test.			ays perform the following before conduct
	nition switch OFF and w nition switch ON.	ait at least	10 seconds.	
	nition switch OFF and w	ait at least	10 seconds.	
•	> GO TO 3. EPNP SIGNAL			
2. Select	nition switch ON.	A MONITO	R" mode with CONSU	LT. Then check the "P/N POSI SW" signa
Pos	ition (Selector lever)	Kr	nown-good signal	-
N or P posit	ion		ON	-
—	ve position		OFF	

Is the inspection result normal?

YES >> GO TO 4.

NO >> Proceed to EC-428, "Diagnosis Procedure".

[VQ35DE]

INFOID:000000011939917

INFOID:000000011939918

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4.PERFORM DTC CONFIRMATION PROCEDURE

- 1. Select "DATA MONITOR" mode with CONSULT.
- 2. Start engine and warm it up to normal operating temperature.
- 3. Maintain the following conditions for at least 50 consecutive seconds.

CAUTION: Always drive vehicle at a safe speed.

ENG SPEED	1,100 - 6,375 rpm
COOLANT TEMP/S	More than 65°C (149°F)
B/FUEL SCHDL	2.2 - 31.8 msec
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-428, "Diagnosis Procedure".

NO >> INSPECTION END

5.PERFORM COMPONENT FUNCTION CHECK

- 1. Turn ignition switch ON.
- 2. Check the voltage between ECM harness connector terminals.

	E	СМ						
+		-	-	Condition		Condition Voltag		Voltage
Connector	Terminal	Connector	Terminal					
F14	83	E10	152	Selector lever P or N		Approx. 0 V		
1 14	00	L10	152	position	Except above	Battery voltage		

Is the inspection result normal?

YES-1 >> To check malfunction symptom before repair: Refer to GI-41, "Intermittent Incident".

YES-2 >> Confirmation after repair: INSPECTION END

NO >> Proceed to <u>EC-428</u>, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000011939919

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.

	+		
Transmission	range switch	—	Voltage
Connector	Terminal	*	
F86	7	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.CHECK TRANSMISSION RANGE SWITCH POWER SUPPLY CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect IPDM E/R harness connector.
- Check the continuity between transmission range switch harness connector and IPDM E/R harness connector.



P0850 PNP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

Transmission range switch IPDM E/R Continuity Connector Terminal Connector Terminal F86 7 F50 61 Existed 4. Also check harness for short to ground. Is the inspection result normal? Second provided to the transformation of the tran	E
Connector Terminal Connector Terminal F86 7 F50 61 Existed 4. 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. 3.CHECK TRANSMISSION RANGE SWITCH SIGNAL CIRCUIT	E
 Also check harness for short to ground. <u>Is the inspection result normal?</u> YES >> Perform the trouble diagnosis for power supply circuit. NO >> Repair or replace error-detected parts. CHECK TRANSMISSION RANGE SWITCH SIGNAL CIRCUIT 	B
Is the inspection result normal? YES >> Perform the trouble diagnosis for power supply circuit. NO >> Repair or replace error-detected parts. 3.CHECK TRANSMISSION RANGE SWITCH SIGNAL CIRCUIT	
YES >> Perform the trouble diagnosis for power supply circuit. NO >> Repair or replace error-detected parts. 3.CHECK TRANSMISSION RANGE SWITCH SIGNAL CIRCUIT	
NO >> Repair or replace error-detected parts. 3.CHECK TRANSMISSION RANGE SWITCH SIGNAL CIRCUIT	
3. CHECK TRANSMISSION RANGE SWITCH SIGNAL CIRCUIT	
1. Turn ignition switch OFF.	
2. Disconnect ECM harness connector.	
3. Check the continuity between transmission range switch harness connector and ECM harness connect	or.
Transmission range switch ECM Continuity	
Connector Terminal Connector Terminal	
F86 10 F14 83 Existed	
Also check harness for short to ground and to power.	
s the inspection result normal?	
YES >> GO TO 4.	
NO >> Repair or replace error-detected parts.	
CHECK TRANSMISSION RANGE SWITCH	
Check the transmission range switch. Refer to TM-101, "Component Inspection".	—
s the inspection result normal?	
YES >> INSPECTION END	
NO >> There is malfunction of transmission range switch. Replace transaxle assembly. Refer to $TM-2$	12,
"Removal and Installation"	

P1078, P1084 EVT CONTROL POSITION SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P1078, P1084 EVT CONTROL POSITION SENSOR

DTC Description

INFOID:0000000011939920

[VQ35DE]

DTC DETECTION LOGIC

An excessively high or low voltage from the sensor is sent to ECM.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition				
		Diagnosis condition	Start engine and let it idle			
P1078	EXH TIM SEN/CIRC-B1 [Exhaust valve timing (EVT) control po-	Signal (terminal)	Voltage signal transmitted from EVT control position sensor to ECM			
	sition sensor (bank 1) circuit]	Threshold	An excessively high or low voltage from the sensor is sent to ECM			
		Diagnosis delay time	—			
P1084		Diagnosis condition	Start engine and let it idle			
	EXH TIM SEN/CIRC-B2	Signal (terminal)	Voltage signal transmitted from EVT control position sensor to ECM			
	[Exhaust valve timing (EVT) control po- sition sensor (bank 2) circuit]	Threshold	An excessively high or low voltage from the sensor is sent to ECM			
		Diagnosis delay time	—			

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.]
- 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 EC-424, "DTC Description".

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.

P1078, P1084 EVT CONTROL POSITION SENSOR

		•		UNIROL	P03110	N SENSUR	[VQ35DE]
	CUIT DIAGN						
	TC detected?			e el une ll			
YES >> NO-1 >>	Proceed to E	<u>=C-431, "Dia</u>	i <u>gnosis Proc</u> motom befor	<u>edure"</u> . e renair: Ret	fer to GL-41	"Intermittent Incident"	
NO-2 >>	Confirmation	n after repair	: INSPECTI	ON END			
	s Procedu						E
Jiagnosia	5 i loccuu						INFOID:000000011939921
.CHECK	DTC PRIOR	ITY					
f DTC P107	'8 or P1084 i	s displayed v	with DTC P0	643, first per	form the cor	firmation procedure (1	rouble diagno-
is) for DTC							
	e DTC detect						
	Perform diag	gnosis of app	olicable. Ref	er to <u>EC-424</u>	. "DTC Desc	<u>cription"</u> .	
	GO TO 2.						
CHECK I	EXHAUST V	ALVE LIMIN	G (EVI) CO	NTROL POS	SITION SEN	SOR POWER SUPPL	_Y
	nect EVT cor		sensor harn	ess connect	or.		_
	nition switch		control posi	tion concor b	arneee con	nector and ground.	
. Check l	ne voltage b					lector and ground.	
		+					
DTC	EVT o	control position	sensor	_	Voltage (V)		
-	Bank	Connector	Terminal				
P1078	1	F82	1				
P1084	2	F81	1	Ground	Approx. 5		
CHECK I . Turn igr . Disconr	GO TO 3. EVT CONTR hition switch hect ECM ha he continuity	OFF. rness conne	ctor.			CUIT	urness connec-
101.							
870	EVT o	control position	sensor	E	СМ		
DTC	Bank	Connector	Terminal	Connector	Terminal	Continuity	
P1078	1	F82	1				
P1084	2	F81	1	F13	28	Existed	
	ction result n						
	INSPECTIO						
NO >>	Repair or re	place error-d	letected part	S.			
.CHECK	EVT CONTR	OL POSITIC	ON SENSOF	R GROUND	CIRCUIT		
Turn igr	nition switch	OFF.					
Disconr	nect ECM ha	rness conne					
	he continuity	between E	VT control p	osition sense	or harness c	onnector and ECM ha	rness connec-
tor.							
	FVT c	control position	sensor	F	СМ		
DTC	Bank	Connector	Terminal	Connector	Terminal	Continuity	
P1078	1 Dalik	F82		Connector	ICIIIIIdi		
	1	ГОД	2	F13	40	Existed	

F81 4. Also check harness for short to ground and short to power.

2

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P1084

F13

40

Existed

P1078, P1084 EVT CONTROL POSITION SENSOR

< DTC/CIRCUIT DIAGNOSIS >

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 EVT CONTROL POSITION SENSOR INPUT SIGNAL CIRCUIT

 Check the continuity between exhaust valve timing control position sensor harness connector and ECM harness connector.

		+			-	
DTC	EVT o	control position	sensor	ECM		Continuity
	Bank	Connector	Terminal	Connector	Terminal	
P1078	1	F82	3	F13	37	Existed
P1084	2	F81	3	115	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 open circuit, short to ground or short to power in harness or connectors.

 $\mathbf{6}$. CHECK EVT CONTROL POSITION SENSOR

Check exhaust valve timing control position sensor. Refer to EC-432, "Component Inspection".

Is the inspection result normal?

- YES >> GO TO 7.
- NO >> Replace malfunctioning EVT control position sensor. Refer to EM-51, "Exploded View".

7.CHECK CKP SENSOR

Check Crankshaft position sensor. Refer to EC-328, "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-334, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace malfunctioning camshaft position sensor. Refer to EM-51, "Exploded View".

9.CHECK CAMSHAFT (EXH)

Check the following.

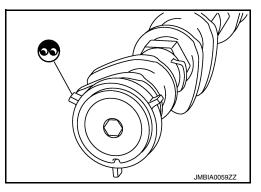
• Accumulation of debris to the signal plate of camshaft rear end

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-79, "Removal and Installation".



Component Inspection

INFOID:0000000011939922

[VQ35DE]

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.

Revision: October 2015



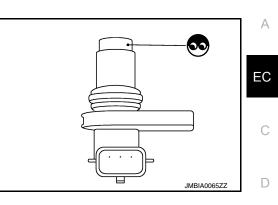
P1078, P1084 EVT CONTROL POSITION SENSOR

< DTC/CIRCUIT DIAGNOSIS >

- 4. Remove the sensor. Refer to <u>EM-51, "Exploded View"</u>.
- 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-51</u>, "Exploded View".



[VQ35DE]

2. EXHAUST VALVE TIMING CONTROL POSITION SENSOR - 2

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

	e timing control n sensor	Cond	ition	5
+	-		Resistance	
Terr	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 <u>EM-51</u>, "<u>Exploded</u> <u>View</u>".

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< DTC/CIRCUIT DIAGNOSIS >

P1148, P1168 CLOSED LOOP CONTROL

DTC Description

INFOID:000000011939923

[VQ35DE]

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
		Diagnosis condition	-	
		Signal (terminal)		
P1148	CLOSED LOOP-B1 (Closed loop bank 1)	Threshold	The closed loop control function for bank 1 does not operate even when vehicle is being driven in the specified condition	
		Diagnosis delay time		
	CLOSED LOOP-B2 (Closed loop bank 2)	Diagnosis condition	—	
		Signal (terminal)	—	
P1168		Threshold	The closed loop control function for bank 2 does not operate even when vehicle is being driven in the specified condition	
		Diagnosis delay time	—	

POSSIBLE CAUSE

- Harness or connectors
- (The A/F sensor 1 circuit is open or shorted.)
- A/F sensor 1
- A/F sensor 1 heater

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P1148 or P1168 is displayed with another DTC for A/F sensor 1, perform the trouble diagnosis for the corresponding DTC.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to <u>EC-107, "DTC Index"</u>.
- NO >> INSPECTION END

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 Description

DTC DETECTION LOGIC

Freeze frame data is not stored in the ECM for this self-diagnosis.

ECM cannot receive the information from "ABS actuator and electric unit (control unit)" continuously.

DTC CONSULT screen terms DT (Trouble diagnosis content)		DTC detection condition	
		Diagnosis condition	Start engine and let it idle
		Signal (terminal)	CAN communication signal
P1212	TCS C/U FUNCTN (TCS control unit function)	Threshold	ECM cannot receive the information from "ABS actuator and electric unit (control unit)" continuously
		Diagnosis delay time	—
(The CAN • ABS actua • Dead (Wea	r connectors communication line is open or s ator and electric unit (control unit ak) battery		
FAIL-SAFE Not applicab			
DTC CONF	IRMATION PROCEDURE		
1. снеск 🛛	DTC PRIORITY		
		XX or P0607, first perf	form the confirmation procedure for DTC
UXXXX or P	20607. <u>e DTC detected?</u>		
	Perform diagnosis of applicab	le.	
	 DTC UXXXX: Refer to <u>EC-107</u> DTC P0607: Refer to <u>EC-419</u>, GO TO 2. 	7 <u>, "DTC_Index"</u> .	
• ·	IDITIONING		
	irmation Procedure has been pr	eviously conducted, alw	vays perform the following before conduct-
1. Turn ign	ition switch OFF and wait at lea	st 10 seconds.	
	nition switch ON. nition switch OFF and wait at lea	st 10 seconds.	
TESTING C	ONDITION:		
Before perf	orming the following procedu	re, confirm that battery	y voltage is more than 10.5 V at idle.
>>	GO TO 3.		
3.PERFOR	M DTC CONFIRMATION PROC	EDURE	
	gine and let it idle for at least 10 Ist trip DTC.	seconds.	

Is 1st trip DTC detected? Revision: October 2015 [VQ35DE]

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P1212 TCS COMMUNICATION LINE

< DTC/CIRCUIT DIAGNOSIS >

- YES >> Proceed to EC-436, "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:000000011939926

1.CHECK DTC PRIORITY

If DTC P1212 is displayed with DTC UXXXX or P0607, first perform the confirmation procedure for DTC UXXXX or P0607.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable.
 - DTC UXXXX: Refer to EC-107, "DTC Index".
 - DTC P0607: Refer to EC-419, "DTC Description".

NO >> GO TO 2.

2. CHECK BRAKE CONTROL SYSTEM

Perform the trouble diagnosis for brake control system.

>> Proceed to <u>BRC-60, "Work Flow"</u> (withouot ICC), <u>BRC-243, "Work Flow"</u> (with ICC).

P1217 ENGINE OVER TEMPERATURE

< DTC/CIRCUIT DIAGNOSIS >

P1217 ENGINE OVER TEMPERATURE

DTC Description

DTC DETECTION LOGIC

If the cooling fan or another component in the cooling system malfunctions, engine coolant temperature will rise.

When the engine coolant temperature reaches an abnormally high temperature condition, a malfunction is cindicated.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
			Diagnosis condition	—
			Signal (terminal)	—
		1	Threshold	Cooling fan does not operate properly (Over- heat)
			Diagnosis delay time	
			Diagnosis condition	
	ENG OVER TEMP [Engine over temperature (Over- heat)]		Signal (terminal)	-
		2	Threshold	Cooling fan system does not operate properly (Overheat)
P1217			Diagnosis delay time	
F 1217		3	Diagnosis condition	—
			Signal (terminal)	—
			Threshold	Engine coolant was not added to the system using the proper filling method
			Diagnosis delay time	—
			Diagnosis condition	-
			Signal (terminal)	-
		4	Threshold	Engine coolant is not within the specified range
			Diagnosis delay time	—

CAUTION:

When a malfunction is indicated, be sure to replace the coolant. Refer to <u>CO-12, "Changing Engine</u> <u>Coolant"</u>. Also, replace the engine oil. Refer to <u>LU-9, "Changing Engine Oil"</u>.

- Fill radiator with coolant up to specified level with a filling speed of 2 liters per minute. Be sure to use coolant with the proper mixture ratio. Refer to <u>MA-17</u>, "FOR USA AND CANADA : Anti-Freeze <u>Coolant Mixture Ratio</u>" (For USA AND CANADA), <u>MA-19</u>, "FOR MEXICO : Engine Coolant Mixture <u>Ratio</u>" (For Mexico).
- 2. After refilling coolant, run engine to ensure that no water-flow noise is emitted.

POSSIBLE CAUSE

- Harness or connectors
- (Cooling fan circuit is open or shorted.)
- IPDM E/R
- Cooling fan motor
- Radiator hose
- Radiator
- Radiator cap
- Reservoir tank
- Water pump
- Thermostat
- Water control valve

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< DTC/CIRCUIT DIAGNOSIS >

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P1217 is displayed with DTC UXXXX or P0607, first perform the confirmation procedure for DTC UXXXX or P0607.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable.
 - DTC UXXXX: Refer to EC-107, "DTC Index".
 - DTC P0607: Refer to <u>EC-419</u>, "DTC Description".

NO >> GO TO 2.

2.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.

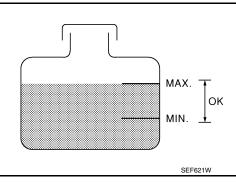
Wrap a thick cloth around cap. Carefully remove the cap by turning it a quarter turn to allow built-up pressure to escape. Then turn the cap all the way off.

Check the coolant level in the reservoir tank and radiator. Allow engine to cool before checking coolant level.

Is the coolant level in the reservoir tank and/or radiator below the

proper range?

- YES >> Proceed to EC-438, "Diagnosis Procedure".
- NO >> GO TO 3.



3.PERFORM COMPONENT FUNCTION CHECK-II

Confirm whether customer filled the coolant or not.

Did customer fill the coolant?

- YES >> Proceed to EC-438, "Diagnosis Procedure".
- NO >> GO TO 4.

4.PERFORM COMPONENT FUNCTION CHECK-III

With CONSULT

- T. Turn ignition switch ON.
- 2. Perform "FAN DUTY CONTROL" in "ACTIVE TEST" mode of "ENGINE" using CONSULT.
- 3. Check that cooling fan speed varies according to the percentage.
- Without CONSULT
- Activate IPDM E/R auto active test and check cooling fan motors operation. Refer to <u>PCS-9</u>, "<u>Diagnosis</u> <u>Description</u>".
- 2. Check that cooling fan operates.

Is the inspection result normal?

- YES-1 >> To check malfunction symptom before repair: Refer to GI-41, "Intermittent Incident".
- YES-2 >> Confirmation after repair: INSPECTION END
- NO >> Proceed to <u>EC-438</u>, "Diagnosis Procedure".

Diagnosis Procedure

1.CHECK DTC PRIORITY

If DTC P1217 is displayed with DTC UXXXX or P0607, first perform the confirmation procedure for DTC UXXXX or P0607.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable.
 - DTC UXXXX: Refer to EC-107, "DTC Index".
 - DTC P0607: Refer to EC-419, "DTC Description".

INFOID:0000000011939928

P1217 ENGINE OVER TEMPERATURE

P1217 ENGINE OVER TEMPERATURE	
< DTC/CIRCUIT DIAGNOSIS > [VQ35DE]	
NO >> GO TO 2.	
2. CHECK COOLING FAN OPERATION	А
With CONSULT	
1. Turn ignition switch ON.	EC
 Perform "FAN DUTY CONTROL" in "ACTIVE TEST" mode of "ENGINE" using CONSULT. Check that cooling fan speed varies according to the percentage. 	
Without CONSULT	
1. Activate IPDM E/R auto active test and check cooling fan motors operation. Refer to <u>PCS-9, "Diagnosis</u>	С
Description ["] . 2. Check that cooling fan operates.	
Is the inspection result normal?	D
YES >> GO TO 3.	
NO >> Proceed to <u>EC-541, "Diagnosis Procedure"</u> .	_
3.CHECK COOLING SYSTEM FOR LEAK-I	Е
Check cooling system for leak. Refer to CO-10, "System Inspection".	
Is leakage detected?	F
YES >> GO TO 4. NO >> GO TO 5.	
4. CHECK COOLING SYSTEM FOR LEAK-II	G
Check the following for leak.	G
 Hose (Refer to <u>CO-10</u>, "System Inspection".) 	
Radiator (Refer to <u>CO-10, "System Inspection"</u> .)	Н
 Water pump (Refer to <u>CO-18, "Removal and Installation"</u>.) 	
>> Repair or replace malfunctioning part.	1
5. CHECK RADIATOR CAP	
Check radiator cap. Refer to <u>CO-10, "System Inspection"</u> .	
Is the inspection result normal?	J
YES >> GO TO 6.	
NO >> Replace radiator cap. Refer to <u>CO-14, "Exploded View"</u> .	Κ
6.CHECK THERMOSTAT	
Check thermostat. Refer to CO-23, "Removal and Installation".	
Is the inspection result normal?	L
	M
	NI
	IN
8. OVERHEATING CAUSE ANALYSIS	0
If the cause cannot be isolated, check the <u>CO-6, "Troubleshooting Chart"</u> .	
	Р
>> INSPECTION END	-
YES >> GO TO 7. NO >> Replace thermostat. Refer to CO-23. "Removal and Installation". 7.CHECK ENGINE COOLANT TEMPERATURE SENSOR Refer to EC-237. "Component Inspection". Is the inspection result normal? YES >> GO TO 8. NO >> Replace engine coolant temperature sensor. Refer to CO-25. "Exploded View". 8.OVERHEATING CAUSE ANALYSIS If the cause cannot be isolated, check the CO-6. "Troubleshooting Chart".	Ν

Revision: October 2015

< DTC/CIRCUIT DIAGNOSIS >

P1225 TP SENSOR

DTC Description

[VQ35DE]

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
		Diagnosis condition	Ignition switch ON	
	CTP LEARNING-B1 (Closed throttle position learning perfor- mance)	Signal (terminal)	Electric throttle control actuator signal	
P1225		Threshold	Closed throttle position learning value is excessively low	
		Diagnosis delay time	_	

POSSIBLE CAUSE

• Electric throttle control actuator (TP sensor 1 and 2)

FAIL-SAFE

Not applicable

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-440, "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:0000000011939930

1. CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

1. Turn ignition switch OFF.

2. Remove the intake air duct. Refer to EM-26, "Removal and Installation".

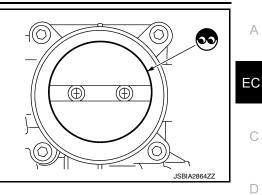
P1225 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

3. Check if foreign matter is caught between the throttle valve and the housing.

Is the inspection result normal?

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-159</u>, <u>"Description"</u>.



2.REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

- 1. Replace electric throttle control actuator. Refer to <u>EM-27</u>, "Removal and Installation".
- 2. Perform Idle Air Volume Learning. Refer to EC-160, "Description".

>> INSPECTION END

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< DTC/CIRCUIT DIAGNOSIS >

P1226 TP SENSOR

DTC Description

[VQ35DE]

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
	CTP LEARNING-B1 (Closed throttle position learning perfor- mance)	Diagnosis condition	Ignition switch ON	
		Signal (terminal)	Electric throttle control actuator signal	
P1226		Threshold	Closed throttle position learning is not per- formed successfully, repeatedly	
		Diagnosis delay time	_	

POSSIBLE CAUSE

• Electric throttle control actuator (TP sensor 1 and 2)

FAIL-SAFE

Not applicable

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. Repeat steps 2 and 3 for 32 times.
- 5. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to EC-442, "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:000000011939932

1.CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

- 1. Turn ignition switch OFF.
- 2. Remove the intake air duct. Refer to EM-26. "Removal and Installation".

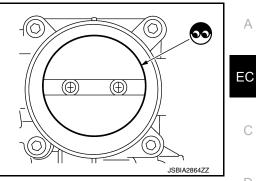
P1226 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

3. Check if foreign matter is caught between the throttle valve and the housing.

Is the inspection result normal?

NO >> Remove the foreign matter and clean the electric throttle control actuator inside, and then perform Throttle Valve Closed Position Learning. Refer to EC-159, "Description".



$2. {\tt REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR}$

- 1. Replace electric throttle control actuator. Refer to EM-27, "Removal and Installation".
- 2. Perform Idle Air Volume Learning. Refer to EC-160, "Description".

>> INSPECTION END

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< DTC/CIRCUIT DIAGNOSIS >

P1550 BATTERY CURRENT SENSOR

DTC Description

INFOID:000000012307650

IVQ35DE1

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
		Diagnosis condition	Start engine and let it idle	
P1550	BAT CURRENT SENSOR (Battery current sensor circuit range/	Signal (terminal)	Voltage signal transmitted from buttery cur- rent sensor to ECM	
P 1550	performance)	Threshold The output voltage of the	The output voltage of the battery current sensor remains within the specified range	
		Diagnosis delay time	—	

POSSIBLE CAUSE

- Harness and connectors (The sensor circuit is open or shorted.)
- Buttery current sensor

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P1550 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to <u>EC-424. "DTC Description"</u>.

NO >> GO TO 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:

Before performing the following procedure, confirm that battery voltage is more than 8 V at idle.

>> GO TO 3.

3.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-444, "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:000000012307651

1.CHECK DTC PRIORITY

If DTC P1550 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to <u>EC-424, "DTC Description"</u>.

NO >> GO TO 2.

2.CHECK BATTERY CURRENT SENSOR POWER SUPPLY

P1550 BATTERY CURRENT SENSOR [VQ35DE] < DTC/CIRCUIT DIAGNOSIS > 1. Disconnect battery current sensor harness connector. 2. Turn ignition switch ON. А Check the voltage between battery current sensor harness connector and ground. 3. + EC Battery current sensor Voltage (V) Connector Terminal F5 1 Ground Approx. 5 Is the inspection result normal? YES >> GO TO 3. D NO >> Repair open circuit, short to ground or short to power in harness or connectors. 3.CHECK BATTERY CURRENT SENSOR GROUND CIRCUIT Е 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 F5 3 F14 64 Existed Also check harness for short to ground and short to power. 4 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 CURRENT SENSOR INPUT SIGNAL CIRCUIT 1. Check the continuity between battery current sensor harness connector and ECM harness connector. + Battery current sensor ECM Continuity Κ Connector Terminal Connector Terminal F5 4 F14 69 Existed Also check harness for short to ground and short to power. 2. Is the inspection result normal? YES >> GO TO 5. M NO >> Repair open circuit, short to ground or short to power in harness or connectors. ${f 5}$. CHECK BATTERY CURRENT SENSOR Check battery current sensor. Refer to EC-445, "Component Inspection". Ν Is the inspection result normal? YES >> INSPECTION END NO >> Replace battery negative cable assembly.

Component Inspection

1.CHECK BATTERY CURRENT SENSOR

1. Turn ignition switch OFF.

Reconnect harness connectors disconnected.

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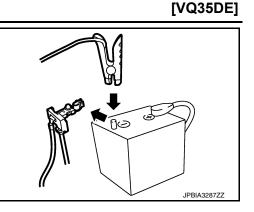
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P1550 BATTERY CURRENT SENSOR

< 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.

Connector	+	_	Voltage (V)
Connector	Terminal	Terminal	
F14	69	64	Approx. 2.5



Before measuring the terminal voltage, confirm that the battery is fully charged. Refer to PG-92, "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

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[VQ35DE]

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
		Diagnosis condition	Ignition switch ON
P1551 BAT CURRENT SENSOR (Battery current sensor circuit low inpu	BAT CURRENT SENSOR	Signal (terminal)	Voltage signal transmitted from buttery cur- rent sensor to ECM
	(Battery current sensor circuit low input)	Threshold	An excessively low voltage from the sensor is sent to ECM
	Diagnosis delay time	Voltage signal transmitted from buttery current sensor to ECM An excessively low voltage from the sensor is	
		Diagnosis condition	Ignition switch ON
P1552 BAT CURRENT SENSOR (Battery current sensor circuit high in- put) Threshold An		Signal (terminal)	o o ,
		Diagnosis delay time	_

POSSIBLE CAUSE

- · Harness and connectors (The sensor circuit is open or shorted.)
- Buttery current sensor

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P1551 or P1552 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. <u>Is applicable DTC detected?</u>

- YES >> Perform diagnosis of applicable. Refer to <u>EC-424, "DTC Description"</u>.
- NO >> GO TO 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.

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 N switch ON

>> GO TO 3.

3.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-448, "Diagnosis Procedure".

NO-1 >> To check malfunction symptom before repair: Refer to GI-41, "Intermittent Incident".

NO-2 >> Confirmation after repair: INSPECTION END

P1551, P1552 BATTERY CURRENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

Diagnosis Procedure

INFOID:000000012307654

1.CHECK DTC PRIORITY

If DTC P1551 or P1552 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to <u>EC-424. "DTC Description"</u>.

NO >> GO TO 2.

2. 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	_	Voltage (V)
Connector	Terminal		
F5	1	Ground	Approx. 5

Is the inspection result normal?

YES >> GO TO 3.

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

3.CHECK BATTERY CURRENT SENSOR GROUND CIRCUIT

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	
F5	3	F14	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

1. Check the continuity between battery current sensor harness connector and ECM harness connector.

+		-		
Battery cur	rrent sensor	ECM		Continuity
Connector	Terminal	Connector Terminal		•
F5	4	F14	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-455, "Component Inspection".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace battery negative cable assembly.

P1551, P1552 BATTERY CURRENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

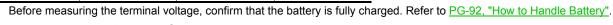
Component Inspection

Revision: October 2015

1.CHECK BATTERY CURRENT SENSOR

- 1. Turn ignition switch OFF.
- 2. Reconnect harness connectors disconnected.
- 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.

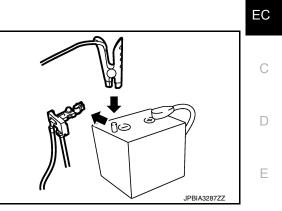
Connector	+	_	Voltage (V)
Connector	Terminal	Terminal	
F14	69	64	Approx. 2.5



Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace battery negative cable assembly.



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P1553 BATTERY CURRENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P1553 BATTERY CURRENT SENSOR

DTC Description

INFOID:000000012307656

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DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
	P1553 BAT CURRENT SENSOR (Battery current sensor performance)	Diagnosis condition	Start engine and let it idle	
		Signal (terminal)	Voltage signal transmitted from buttery cur- rent sensor to ECM	
P1553		Threshold	The signal voltage transmitted from the sen- sor to ECM is higher than the amount of the maximum power generation	
		Diagnosis delay time	-	

POSSIBLE CAUSE

- Harness and connectors (The sensor circuit is open or shorted.)
- Buttery current sensor

FAIL-SAFE Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P1553 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to EC-424, "DTC Description".

NO >> GO TO 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:

Before performing the following procedure, confirm that battery voltage is more than 8 V at idle.

>> GO TO 3.

3. 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-450, "Diagnosis Procedure".

- NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-41, "Intermittent Incident"</u>.
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000012307657

1.CHECK DTC PRIORITY

If DTC P1550 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to EC-424, "DTC Description".

NO >> GO TO 2.

P1553 BATTERY CURRENT SENSOR

< DTC/CIRCU				KENT SENSOR	[VQ35DE]
2. CHECK BA	TTERY CURRE	ENT SENSOR	POWER SUPF	PLY	
1. Disconnec		nt sensor harne			<i>P</i>
		en battery curre	ent sensor harn	ess connector and ground	d.
	+			_	
	rrent sensor		Voltage (V)		(
Connector	Terminal	-	0 ()		
F5	1	Ground	Approx. 5	_	
Is the inspection	on result norma	<u>l?</u>	I	-	Γ
	О ТО 3.				
•		-		power in harness or conn	ectors.
3.CHECK BA		ENT SENSOR	GROUND CIR	CUIT	
	on switch OFF. t ECM harness	connector			F
			rrent sensor ha	rness connector and ECM	
	+	-	_		(
	rrent sensor		CM	Continuity	
Connector	Terminal	Connector	Terminal		ŀ
F5	3	F14	64	Existed	
		nort to ground a	and short to pov	wer.	
Is the inspection YES >> GO	D TO 4.	<u>1 (</u>			
		iit, short to grou	und or short to	power in harness or conn	ectors.
4.CHECK BA		ENT SENSOR	INPUT SIGNAI		
1. Check the	continuity betw	een battery cu	rrent sensor ha	rness connector and ECM	A harness connector.
	5	, ,			
	+	-	_		ŀ
Battery cur	rrent sensor	EC	CM	Continuity	
Connector	Terminal	Connector	Terminal		L
F5	4	F14	69	Existed	
		nort to ground a	and short to pov	wer.	Ν
Is the inspectio		<u>l?</u>			Ν
	O TO 5. Phair open circu	uit short to arou	ind or short to	power in harness or conn	ectors
5.CHECK BA					N
Check battery			55 "Componer	t Inspection"	
Is the inspectio					C
	SPECTION EN				
NO >> Re	eplace battery r	egative cable a	assembly.		
Component	Inspection				INFOID:000000012307658
1. СНЕСК ВА	TTERY CURRE	ENT SENSOR			
1 Turn ignitic	on switch OFF				

1. Turn ignition switch OFF.

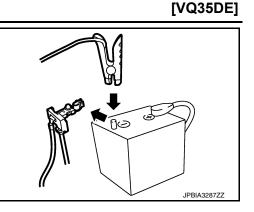
2. Reconnect harness connectors disconnected.

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	
F14	69	64	Approx. 2.5



Before measuring the terminal voltage, confirm that the battery is fully charged. Refer to PG-92, "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 Description

DTC DETECTION LOGIC

NOTE:

If DTC P1554 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. Refer to <u>EC-424, "DTC Description"</u>.

DTC	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition
		Diagnosis condition	-
	BAT CURRENT SENSOR	Signal (terminal)	Voltage signal transmitted from buttery cur- rent sensor to ECM
P1554	(Battery current sensor performance)	Threshold	The output voltage of the battery current sen- sor is lower than the specified value while the battery voltage is high enough
		Diagnosis delay time	-
 Buttery cui FAIL-SAFE Not applicab 	nd connectors (The sensor circuit rrent sensor	is open or shorted.)	
	IRMATION PROCEDURE		
1.CHECK	DTC PRIORITY		
	4 is displayed with DTC P0643, fi	rst perform the trouble	e diagnosis for DTC P0643.
	<u>: DTC detected?</u> Perform diagnosis of applicable. I	Pefer to EC_424 "DT(C Description"
	GO TO 2.		
2.PRECON	IDITIONING		
check, a 1st TESTING C • Before pe	trip DTC might not be confirmed. ONDITION: rforming the following procedu	re, confirm that batt	e battery current sensor circuit. During this ery voltage is more than 12.8 V at idle. bad switches and A/C switch are turned
>>	GO TO 3.		
3.PERFOR	M COMPONENT FUNCTION CH	IECK	
 Select "I Check " 	gine and let it idle. BAT CUR SEN" in "DATA MONIT BAT CUR SEN" indication for 10 s	seconds.	ULT.
Without C 1. Start eng	UR SEN" should be above 2.3 N CONSULT gine and let it idle. roltage between ECM harness col		er the following conditions.

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INFOID:000000012307659

P1554 BATTERY CURRENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

	ECM		
Connector	+	-	Voltage (V)
Connector	Termi	nal	
F14	69	64	Above 2.3 at least once

Is the inspection result normal?

YES-1 >> To check malfunction symptom before repair: Refer to GI-41, "Intermittent Incident".

YES-2 >> Confirmation after repair: INSPECTION END

NO >> Proceed to <u>EC-454</u>. "Diagnosis Procedure"

Diagnosis Procedure

INFOID:000000012307661

1. CHECK DTC PRIORITY

If DTC P1554 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to <u>EC-424, "DTC Description"</u>.

NO >> GO TO 2.

2.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	_	Voltage (V)
Connector	Connector Terminal		
F5 1		Ground	Approx. 5

Is the inspection result normal?

YES >> GO TO 3.

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

3.CHECK BATTERY CURRENT SENSOR GROUND CIRCUIT

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		*
F5	3	F14	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.

 ${f 4}$.CHECK BATTERY CURRENT SENSOR INPUT SIGNAL CIRCUIT

1. Check the continuity between battery current sensor harness connector and ECM harness connector.

+				
Battery cu	Battery current sensor		CM	Continuity
Connector	Terminal	Connector Terminal		
F5	4	F14	69	Existed

P1554 BATTERY CURRENT SENSOR

	P	1554 BATTE	ERY CURRENT S	SENSOR	
< DTC/CIRCUI	T DIAGNOSIS	>		[VQ35DE]	
	5				
	n result normal?				А
YES >> GO NO >> Rep		short to around	l or short to power in h	narness or connectors.	
_ '	TERY CURREN	-			EC
			"Component Inspection	on"	
	n result normal?	<u> </u>		<u></u> .	C
•	PECTION END				0
NO >> Rej	place battery neg	gative cable ass	sembly.		
Component	Inspection			INFOID:000000012307662	D
1. СНЕСК ВАТ	TERY CURREN	IT SENSOR			
	n switch OFF.				E
	harness connec battery negative		ed.		
4. Install jump			ive terminal and body		F
ground. 5. Turn ignitio	n switch ON.				
6. Check the	voltage betweer		connector terminals		G
under the fo	ollowing conditio	ns.			0
	ECM				
	+	_	Voltage (V)		Η
Connector	Terminal	Terminal		JPBIA3287ZZ	
F14	69	64	Approx. 2.5		
Before measu	ring the terminal vol	tage, confirm that tl	he battery is fully charged.	Refer to PG-92, "How to Handle Battery".	
	n result normal?				J
	SPECTION END	native cable ass	sembly		
			sembly.		
					K
					L
					M
					IVI
					Ν
					0

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P1556, P1557 BATTERY TEMPERATURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P1556, P1557 BATTERY TEMPERATURE SENSOR

DTC Description

INFOID:000000012307663

[VQ35DE]

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
		Diagnosis condition	Start engine and let it idle	
BAT TMP SEN/CIRC (Battery temperature sensor circuit low input)	BAT TMP SEN/CIRC	Signal (terminal)	Voltage signal transmitted from buttery tem- perature sensor to ECM	
	Threshold	Signal voltage from battery temperature sen- sor remains 0.16 V or less for 5 seconds or more		
		Diagnosis delay time	_	
		Diagnosis condition	Start engine and let it idle	
	BAT TMP SEN/CIRC	Signal (terminal)	Voltage signal transmitted from buttery tem- perature sensor to ECM	
P1557 (Battery temperature sensor circuit hi input)	(Battery temperature sensor circuit high input)	Threshold	Signal voltage from battery temperature sen- sor remains 4.84 V or more for 5 seconds or more	
		Diagnosis delay time	—	

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 shorted.] [Complete position sensor (DUESE)
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 seconds or more.	 [Camshaft position sensor (PHESE) circuit is open or shorted.] (Accelerator pedal position sensor 2 circuit is shorted.) (Throttle position sensor circuit is shorted.) Battery current sensor (Battery tem- perature sensor) Camshaft position sensor (PHESE) Accelerator pedal position sensor Throttle position sensor

POSSIBLE CAUSE

- · Harness and connectors
- [Battery current sensor (Battery temperature sensor) circuit is shorted.]
- [Camshaft position sensor (PHESE) circuit is open or shorted.]
- (Accelerator pedal position sensor 2 circuit is shorted.)
- (Throttle position sensor circuit is shorted.)
- Battery current sensor (Battery temperature sensor)
- Camshaft position sensor (PHESE)
- Accelerator pedal position sensor
- Throttle position sensor

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

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

				ERY TEMPERATURE SENSOR	
DTC/CIRC	UIT DIAG	NOSIS >		[VQ35	DE]
ESTING CO	ONDITION:			10 seconds. confirm that battery voltage is 10 V or more at idle.	
>> (GO TO 2.				
.PERFORI	и ртс со	NFIRMATIO	N PROCED	DURE	
. Check 1s s 1st trip DT	st trip DTC <u>C detected</u>	?			
NO-1 >> 7	o check m	EC-457, "Di alfunction sy n after repai	mptom befo	fore repair: Refer to GI-41, "Intermittent Incident".	
Diagnosis	Procedu	ire		INFO/D:0000000	12307664
	ATTERY T	EMPERATI	IRE SENSO	OR INPUT SIGNAL	
. Turn igni	tion switch			connector. sensor harness connector and ground.	
	+				
Battery	current senso	r	_	Voltage (V)	
Connector	-				
F5	1	Ģ	Ground	Approx. 5	
	GO TO 3. GO TO 2.		IRE SENSO	OR INPUT SIGNAL CIRCUIT	
CHECK B					
CHECK B . Turn igni . Disconne	tion switch ect ECM ha e continuit	ON. arness conne	ector.	ent sensor harness connector and ECM harness connector	r.
CHECK B . Turn igni . Disconne . Check th	tion switch ect ECM ha e continuit	ON. arness conne y between b	ector. attery currer		r.
CHECK B . Turn igni . Disconne . Check th	tion switch ect ECM ha e continuit	ON. arness conne y between b	ector. attery currer	ent sensor harness connector and ECM harness connector	 r.
CHECK B . Turn igni . Disconne . Check th + Battery curr Connector F5	tion switch ect ECM ha e continuit ent sensor Terminal 2	ON. arness conne y between b E Connector F14	ector. attery currer - CM	ent sensor harness connector and ECM harness connector	r.
CHECK B Turn igni Disconne Check th H Battery curr Connector F5 S the inspect YES >> F NO >> F	tion switch ect ECM ha e continuit ent sensor Terminal 2 tion result r Perform the Repair or re	ON. arness conne y between b Connector F14 <u>normal?</u> e trouble diageplace error-	ector. attery currer CM Terminal 68 gnosis for po	ent sensor harness connector and ECM harness connector	r.
CHECK B Turn igni Disconne Check th + Battery curr Connector F5 S the inspect YES >> F NO >> F NO >> F CHECK B Turn igni Disconne	tion switch ect ECM ha e continuit ent sensor Terminal 2 tion result r Perform the Repair or re ATTERY T tion switch ect ECM ha	ON. arness conne y between b Connector F14 cormal? e trouble diage place error- EMPERATU OFF. arness conne	ector. attery currer CM Terminal 68 gnosis for po detected pa IRE SENSO	ent sensor harness connector and ECM harness connector Continuity Existed bower supply circuit. arts.	
CHECK B Turn igni Disconne Check th + Battery curr Connector F5 S the inspect YES >> F NO >> F NO >> F CHECK B Turn igni Disconne	tion switch ect ECM ha e continuit ent sensor Terminal 2 tion result r Perform the Repair or re ATTERY T tion switch ect ECM ha	ON. arness conne y between b Connector F14 cormal? e trouble diage place error- EMPERATU OFF. arness conne	ector. attery currer CM Terminal 68 gnosis for po detected pa IRE SENSO	ent sensor harness connector and ECM harness connector Continuity Existed power supply circuit. arts. DR GROUND CIRCUIT	
CHECK B Turn igni Disconne Check th + Battery curr Connector F5 S the inspect YES >> F NO >> F S.CHECK B CHECK B Turn igni Disconne Check th	tion switch ect ECM ha e continuit ent sensor Terminal 2 tion result r Perform the Repair or re ATTERY T tion switch ect ECM ha e continuit	ON. arness conner y between b Connector F14 cormal? e trouble diage place error- EMPERATU OFF. arness conner y between b	ector. attery currer CM Terminal 68 gnosis for po detected pa IRE SENSO	ent sensor harness connector and ECM harness connector Continuity Existed Oower supply circuit. arts. OR GROUND CIRCUIT ent sensor harness connector and ECM harness connector	
CHECK B Turn igni Disconne Check th Check th Connector F5 Sthe inspect YES >> F NO >> F NO >> F CHECK B CHECK B CHECK B CHECK B CHECK B	tion switch ect ECM ha e continuit ent sensor Terminal 2 tion result r Perform the Repair or re ATTERY T tion switch ect ECM ha e continuit	ON. arness conner y between b Connector F14 Connector F14 crouble diage eplace error- EMPERATU OFF. arness conner y between b 	ector. attery curren CM Terminal 68 gnosis for po detected pa IRE SENSO ector. attery curren	ent sensor harness connector and ECM harness connector Continuity Existed bower supply circuit. arts. DR GROUND CIRCUIT ent sensor harness connector and ECM harness connector nuity	

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

Is the inspection result normal?

P1556, P1557 BATTERY TEMPERATURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

- YES >> GO TO 4.
- NO >> Repair open circuit, short to ground or short to power in harness or connectors.

4.CHECK BATTERY TEMPERATURE SENSOR

Check battery temperature sensor. Refer to <u>EC-458</u>, "Component Inspection (Battery Temperature Sensor)". Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace battery negative cable assembly.

Component Inspection (Battery Temperature Sensor)

INFOID:000000012307665

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.

Battery cur		
+	Resistance	
Terr		
2	3	continuity with the resistance value 100 $\Omega \text{or more}$

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace battery negative cable assembly.

P1564 ASCD STEERING SWITCH

< DTC/CIRCUIT DIAGNOSIS >

P1564 ASCD STEERING SWITCH

DTC Description

DTC DETECTION LOGIC

- 1. An excessively high voltage signal from the ASCD steering switch is sent to ECM.
- 2. ECM detects that input signal from the ASCD steering switch is out of the specified range.
- 3. ECM detects that the ASCD steering switch is stuck ON.

DTC	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition				
			Diagnosis condition	-			
			Signal (terminal)	ASCD steering switch signal			
		1	Threshold	An excessively high voltage signal from the ASCD steering switch is sent to ECM			
			Diagnosis delay time	-			
P1564 ASCD SW (ASCD steering)			Diagnosis condition	—			
			Signal (terminal)	ASCD steering switch signal			
	(ASCD steering switch)	2	Threshold	ECM detects that input signal from the ASCD steering switch is out of the specified range			
			Diagnosis delay time	-			
			Diagnosis condition	-			
			Signal (terminal)	ASCD steering switch signal			
		3	Threshold	ECM detects that the ASCD steering switch is stuck ON			
			Diagnosis delay time	_			

POSSIBLE CAUSE	
 Harness or connectors 	

(The switch circuit is open or shorted.)

ASCD steering switch

• ECM

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P1564 is displayed with DTC P0605, first perform the confirmation procedure for DTC P0605. Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to EC-415, "DTC Description".

NO >> GO TO 2.

2.PRECONDITIONING

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.
- 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. 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.

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P1564 ASCD STEERING SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

- 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-460, "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:0000000011939934

1.CHECK DTC PRIORITY

If DTC P1564 is displayed with DTC P0605, first perform the confirmation procedure for DTC P0605. Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to <u>EC-415</u>, "DTC Description".

NO >> GO TO 2.

2. CHECK ASCD STEERING SWITCH CIRCUIT

() With CONSULT

- 1. Turn ignition switch ON.
- 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 SWICH	Released	OFF
CANCEL SW	CANCEL switch	Pressed	ON
CANCEL SW	CANCEL SWICH	Released	OFF
RESUME/ACC SW	RFS/+ switch	Pressed	ON
RESUME/ACC SW	RES/ Switch	Released	OFF
SET SW	SET/- switch	Pressed	ON
		Released	OFF

Without CONSULT

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			
E10			MAIN switch: Pressed	Approx. 0	
	134	135	CANCEL switch: Pressed	Approx. 1	
	134	155	SET/- switch: Pressed	Approx. 1.46	
			RES/+ switch: Pressed	Approx. 2.26	

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 3.

3. CHECK ASCD STEERING SWITCH GROUND CIRCUIT

1. Turn ignition switch OFF.

- 2. Disconnect ECM harness connector.
- 3. Disconnect combination switch harness connector M149.

P1564 ASCD STEERING SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

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mbination switch	EC	CM	Continuity
Terminal	Connector	Terminal	Continuity
18	E10	135	Existed

NO >> Repair or replace error-detected parts.

4. CHECK ASCD STEERING SWITCH INPUT SIGNAL CIRCUIT

1. Check the continuity between combination switch and ECM harness connector.

					E	
Combination switch	ECM		on switch ECM Continuity			
Terminal	Connector	Terminal	Continuity			
15	E10	134	Existed		F	
2. Also check ha	arness for shor	t to ground ar	nd short to powe			
Is the inspection r	esult normal?					
YES >> GO T	O 5.				(
NO >> Repa	ir or replace er	ror-detected p	oarts.			
5.CHECK ASCD	STEERING S	WITCH			F	
Check ASCD stee	ring switch. R	efer to EC-46	1, "Component	spection".		
Is the inspection r	esult normal?					
YES >> INSP	ECTION END				1	
NO >> Repla	ce ASCD stee	ring switch. R	efer to <u>AV-184.</u>	Removal and Installation".		

Component Inspection

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.

Combination switch		Condition Resistance (Ω)		
Connector	Terminals	Condition		
		MAIN switch: Pressed	Approx. 0	
		CANCEL switch: Pressed	Approx. 250	
M149 15	15 and 18	SET/- switch: Pressed	Approx. 660	
		RES/+ switch: Pressed	Approx. 1,490	
		All ASCD steering switches: Released	Approx. 3,980	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace ASCD steering switch. Refer to <u>AV-184. "Removal and Installation"</u>.

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< DTC/CIRCUIT DIAGNOSIS >

P1564 ICC STEERING SWITCH

DTC Description

INFOID:000000011939936

[VQ35DE]

DTC DETECTION LOGIC

- 1. An excessively high voltage signal from the ICC steering switch is sent to ECM.
- 2. ECM detects that input signal from the ICC steering switch is out of the specified range.
- 3. ECM detects that the ICC steering switch is stuck ON.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition			
			Diagnosis condition	-	
			Signal (terminal)	ICC steering switch signal	
		1	Threshold	An excessively high voltage signal from the ICC steering switch is sent to ECM	
			Diagnosis delay time	-	
	ASCD SW (ICC steering switch)		Diagnosis condition	—	
		2	Signal (terminal)	ICC steering switch signal	
P1564			Threshold	ECM detects that input signal from the ICC steering switch is out of the specified range	
			Diagnosis delay time	-	
		3	Diagnosis condition		
			Signal (terminal)	ICC steering switch signal	
			Threshold	ECM detects that the ICC steering switch is stuck ON	
			Diagnosis delay time	-	

POSSIBLE CAUSE

- Harness or connectors
- (The switch circuit is open or shorted.)
- ICC steering switch
- ECM

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P1564 is displayed with DTC P0605, first perform the confirmation procedure for DTC P0605. Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to <u>EC-415, "DTC Description"</u>.

NO >> GO TO 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.

>> GO TO 3.

3. 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.

P1564 ICC STEERING SWITCH

		ГІЭ	04 ICC	STEERING SWITCH			
< DTC/CIF	RCUIT DIAGNO	SIS >				[VQ35DE]	
4. Press 5. Press	RES/+ switch for SET/– switch for	at least 10 at least 10	seconds, seconds,	ds, then release it and wait at least 10 then release it and wait at least 10 se then release it and wait at least 10 se onds, then release it and wait at least 1	econds. conds.		А
7. Check							EC
Is DTC det							
NO-1 >	Proceed to <u>EC-</u> To check malfu Confirmation at	nction symp	otom befo	re repair: Refer to GI-41, "Intermittent	Incident".		С
Diagnos	is Procedure				INFO	DID:0000000011939937	
							D
	DTC PRIORITY						
			0605, first	perform the confirmation procedure for	or DTC P060)5.	Е
	le DTC detected		aabla Dai	for to EC 445. "DTC Description"			
	> GO TO 2.	sis or appli	cable. Re	fer to EC-415. "DTC Description".			
2. CHECK ICC STEERING SWITCH CIRCUIT							F
	gnition switch ON						
			arness co	onnector terminals under the following	conditions.		G
							0
	ECM	1					
Connector	+		-	Condition	Voltage (V)	Н
		Terminal					
				MAIN switch: Pressed	Approx. 0		I
				CANCEL switch: Pressed	Approx. 1.1		
E10	134		135	DISTANCE switch: Pressed	Approx. 1.5		
				SET/- switch: Pressed	Approx. 2.0		J
				RES/+ switch: Pressed	Approx. 2.7	1	
· · · · · ·							K
	> INSPECTION E > GO TO 3.	END					
-	CICC STEERING	SWITCH C	GROUND	CIRCUIT			
	gnition switch OF						L
	nnect ECM harne		or.				
	nect combination						M
4. Check	the continuity be	etween com	bination s	witch and ECM harness connector.			
Combinatio	on switch	ECM					
Termi			minal	Continuity			Ν
18			35	Existed			
	heck harness for						0
	ection result norn	-					
YES >	> GO TO 4.						_
4	> Repair or repla						Ρ
4.CHECK	CICC STEERING	SWITCH I					

1. Check the continuity between combination switch and ECM harness connector.

P1564 ICC STEERING SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

Combination switch	E	Continuity	
Terminal	Connector	Terminal	Continuity
15	E10	134	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 ICC STEERING SWITCH

Check ICC steering switch. Refer to EC-464, "Component Inspection".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace ICC steering switch. Refer to <u>EC-15. "ENGINE CONTROL SYSTEM : Component Parts</u> <u>Location"</u>.

Component Inspection

INFOID:000000011939938

1. CHECK ICC STEERING SWITCH

- 1. Turn ignition switch OFF.
- 2. Disconnect combination switch (spiral cable) harness connector M149.
- 3. Check resistance between combination switch harness connector terminals under the following conditions.

Combination switch		Condition	Resistance (Ω)	
Connector	Terminals	Condition		
M149 15 and 1		MAIN switch: Pressed	Approx. 0	
		CANCEL switch: Pressed	Approx. 310	
	15 and 19	DISTANCE switch: Pressed	Approx. 740	
		SET/- switch: Pressed	Approx. 1,410	
		RES/+ switch: Pressed	Approx. 2,590	
		All ICC steering switches: Released	Approx. 5,460	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace ICC steering switch. Refer to <u>AV-184, "Removal and Installation"</u>.

P1568 ICC FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

P1568 ICC FUNCTION

DTC Description

A

EC

INFOID:000000011939939

[VQ35DE]

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DTC DETECTION LOGIC
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ECM detects a difference between signals from ADAS control unit is out of specified range.

DTC	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition
		Diagnosis condition	
P1568 ICC COMMAND VALUE (ICC function)	Signal (terminal)	ADAS control unit signal	
	Threshold	ECM detects a difference between signals from ADAS control unit is out of specified range	
		Diagnosis delay time	_
POSSIBLE • Harness o • ADAS con • ECM FAIL-SAFE	r connectors (The CAN communi trol unit	cation line is open or s	shorted.)
Not applicat			
DTC CONF	IRMATION PROCEDURE		
1.снески	DTC PRIORITY		
YES >> NO >> 2.PRECON	 <u>DTC detected?</u> Perform diagnosis of applicable DTC UXXXX: Refer to <u>EC-107</u>, DTC P0605: Refer to <u>EC-415</u>, ' DTC P0607: Refer to <u>EC-419</u>, ' GO TO 2. IDITIONING 	"DTC Index". 'DTC Description". 'DTC Description".	
before cond 1. Turn igr 2. Turn igr 3. Turn igr TESTING C	ucting the next test. ition switch OFF and wait at leas ition switch ON. ition switch OFF and wait at leas ONDITION:	t 10 seconds. t 10 seconds.	always perform the following procedure
	to be easier, it is unnecessary		p
•	GO TO 3. M DTC CONFIRMATION PROCI	EDURE	
 Turn igr Press M Drive th CAUTIC Always 	ition switch ON. IAIN switch on ICC steering switc e vehicle at more than 40 km/h (2 N: drive vehicle at a safe speed. ET/– switch.	h.	

Is DTC detected?

YES >> Proceed to EC-466, "Diagnosis Procedure".

P1568 ICC FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

NO-1 >> To check malfunction symptom before repair: Refer to GI-41, "Intermittent Incident".

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000011939940

1.CHECK DTC PRIORITY

If DTC P1568 is displayed with DTC UXXXX, P0605 or P0607, first perform the confirmation procedure for DTC UXXXX, P0605 or P0607.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable.
 - DTC UXXXX: Refer to EC-107, "DTC Index".
 - DTC P0605: Refer to EC-415, "DTC Description".
 - DTC P0607: Refer to EC-419, "DTC Description".

NO >> GO TO 2.

2.REPLACE ADAS CONTROL UNIT

- 1. Replace ADAS control unit. Refer to DAS-80, "Removal and Installation".
- 2. Perform Additional Service When Replacing ADAS Control Unit. Refer to <u>DAS-36, "Description"</u>.
- 3. Check DTC of ADAS control unit. Refer to DAS-14, "CONSULT Function (ICC/ADAS)".

>> INSPECTION END

P1572 ASCD BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

P1572 ASCD BRAKE 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-41</u>, "<u>AUTOMATIC SPEED CONTROL DEVICE (ASCD)</u> : <u>System Description</u>" for the ASCD function.

DTC Description

DTC DETECTION LOGIC

NOTE:

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.

- 1. 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.
- 2. Brake pedal position switch signal is not sent to ECM for extremely long time while the vehicle is driving.

DTC	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition	
P1572 ASCD BRAKE SW (Brake pedal position switch)		Diagnosis condition	-	
	1	Signal (terminal)	Brake pedal position switch signalStop lamp switch signal	
		Threshold	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	
		Diagnosis delay time	-	
	2	Diagnosis condition	_	
		Signal (terminal)	Brake pedal position switch signal	
		Threshold	Brake pedal position switch signal is not sent to ECM for extremely long time while the ve- hicle is driving	
			Diagnosis delay time	Extremely long time

POSSIBLE CAUSE

DTC P1572 - 1	M
Harness or connectors	
(The stop lamp switch circuit is shorted.)	
Harness or connectors	
(The brake pedal position switch circuit is shorted.)	N
Stop lamp switch	
Brake pedal position switch	
 Incorrect stop lamp switch installation 	0
 Incorrect brake pedal position switch installation 	
• ECM	
DTC P1572 - 2	Р
Harness or connectors	
(The stop lamp switch circuit is shorted.)	
Harness or connectors	
(The brake pedal position switch circuit is shorted.)	
Stop lamp switch	
Brake pedal position switch	
Incorrect stop lamp switch installation	

INFOID:000000011939941

INFOID:000000011939942

EC

D

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F

А

< DTC/CIRCUIT DIAGNOSIS >

· Incorrect brake pedal position switch installation

• ECM

FAIL-SAFE Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P1572 is displayed with DTC P0605, first perform the confirmation procedure for DTC P0605. <u>Is applicable DTC detected?</u>

YES >> Perform diagnosis of applicable. Refer to <u>EC-415</u>, "DTC Description".

NO >> GO TO 2.

2.INSPECTION START

Do you have CONSULT?

Do you have CONSULT?

YES >> GO TO 3.

NO >> GO TO 6.

3. 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 4.

4.PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION 1-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:

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-469, "Diagnosis Procedure".

NO >> GO TO 5.

5.PERFORM DTC CONFIRMATION PROCEDURE 1-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)

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

DIC								
Selector	r lever		Si	uitable po	osition			
Driving	location		fiv	ve secon		al for more than to come off from ehicle speed.		
2. Che	eck 1st tri	DTC.				•		
	ip DTC de							
YES NO		EC-469 ECTION	<u>, "Diagnosi</u> END	is Proce	edure".			
3. PER	FORM CO			TION C	HECK			
	n ignition eck the vo		N. ween ECM	1 harnes	ss connect	ors.		
	ECM						-	
Con-	+	_	(Conditior	ı	Voltage		
nector	Terminal	Terminal	ť					
E40	140	450	Droke resta		Slightly depressed	Approx. 0 V	-	
E10	140	152	Brake pedal	1	Fully re- leased	Battery voltage	-	
s the in	spection	result noi	rmal?				-	
NO 7.PER	2 >> Conf >> GO 1 FORM C(irmation a TO 7. OMPONE	after repair: ENT FUNC	: ÍNSPE TION C	HECK-II	ND	I-41. "Intermittent I	<u></u> .
NO 7.PER	2 >> Conf >> GO T FORM CO	irmation a TO 7. OMPONE	after repair:	: ÍNSPE TION C	HECK-II	ND		<u></u> .
NO 7.PER Check t	2 >> Conf >> GO 1 FORM CO he voltage ECM	irmation a TO 7. OMPONE	after repair: ENT FUNC ⁻ n ECM harr	TION C	HECK-II		_	<u></u> .
NO 7.PER Check t	2 >> Conf >> GO T FORM CO he voltago ECM +	irmation a TO 7. DMPONE e betwee 	after repair: ENT FUNC ⁻ n ECM harr	: ÍNSPE TION C	HECK-II	ND Voltage	_	
NO 7.PER Check t	2 >> Conf >> GO 1 FORM CO the voltage ECM + Terminal	irmation a TO 7. DMPONE e betwee 	after repair: ENT FUNC ⁻ n ECM har	: ÍNSPE TION C ness co	HECK-II		-	<u></u> .
NO 7.PER Check t	2 >> Conf >> GO T FORM CO he voltago ECM +	irmation a TO 7. DMPONE e betwee 	after repair: ENT FUNC ⁻ n ECM harr	: ÍNSPE TION C ness co	HECK-II	Voltage	-	
NO 7.PER Check t	2 >> Conf >> GO 1 FORM CO the voltage ECM + Terminal	irmation a TO 7. DMPONE e betwee 	after repair: ENT FUNC n ECM harr Brake pedal	: ÍNSPE TION C ness co	n Slightly depressed Fully re-	Voltage Battery voltage	-	
NO 7.PER Check t Con- nector E10 <u>s the in</u> YES-1	 >> Conf >> GO 1 FORM CO he voltage ECM + Terminal 139 nspection >> To ch >> Conf 	irmation a TO 7. DMPONE betwee 	after repair: ENT FUNC ⁻ n ECM harr Brake pedal	: INSPE TION C mess co Condition	HECK-II onnectors.	Voltage Battery voltage Approx. 0 V air: Refer to <u>G</u>	-	
NO 7.PER Check t Con- nector E10 <u>s the in</u> YES-1 YES-2 NO	 >> Conf >> GO 1 FORM CO he voltage ECM + Terminal 139 nspection >> To ch >> Conf 	irmation a TO 7. DMPONE betwee - Terminal 152 result nor heck malf irmation a D <u>EC-469</u>	after repair: ENT FUNC ⁻ n ECM hard Brake pedal mal? unction syn after repair: . "Diagnosi	: INSPE TION C mess co Condition	HECK-II onnectors.	Voltage Battery voltage Approx. 0 V air: Refer to <u>G</u>	-	
NO 7.PER Check t Con- nector E10 S the in YES-1 YES-2 NO Diagno	 >> Conf >> GO T FORM CO he voltage ECM + Terminal 139 aspection >> To ch >> Conf >> Conf >> Go to Osis Pro 	irmation a TO 7. DMPONE betwee Terminal 152 result non to EC-469 DCEdure	after repair: ENT FUNC [®] n ECM harr Brake pedal Brake pedal rmal? unction syr after repair: "Diagnosi	: INSPE TION C mess co Condition	HECK-II onnectors.	Voltage Battery voltage Approx. 0 V air: Refer to <u>G</u>	-	ncident".
NO 7.PER Check t Con- nector E10 S the in YES-1 YES-2 NO Diagno 1.CHE	 >> Conf >> GO T FORM CO he voltage ECM + Terminal 139 139 spection >> To ch >> Conf >> Conf >> Go to Osis Pro CK DTC I 	irmation a TO 7. DMPONE betwee Terminal 152 result non to EC-469 DEC-469 DECCUTE	after repair: ENT FUNC ⁻ n ECM harr Brake pedal Brake pedal rmal? function syr after repair: , "Diagnosi P	: ÍNSPE TION C mess co Condition	HECK-II onnectors.	Voltage Battery voltage Approx. 0 V air: Refer to <u>G</u>	- - - 	<u>ncident"</u> . ///FOID:000000011939943
NO 7.PER Check t Con- nector E10 S the in YES-1 YES-2 NO Diagno f DTC I	Souther Section 1 FORM CO FORM CO FORM CO ECM ECM + Terminal 139 Inspection Souther Section Souther Section Souther Section Configure Section Souther Section ECK DTC I P1572 is contracted and section	irmation a TO 7. DMPONE e betwee - Terminal 152 result nor neck malf irmation a b EC-469 DCEdURE PRIORIT displayed	after repair: ENT FUNC n ECM hard Brake pedal Brake pedal mail? function syn after repair: . "Diagnosi Y with DTC I	: ÍNSPE TION C mess co Condition	HECK-II onnectors.	Voltage Battery voltage Approx. 0 V air: Refer to <u>G</u>	-	<u>ncident"</u> . ///FOID:000000011939943
NO 7.PER Check t Con- nector E10 S the in YES-1 YES-2 NO Diagn f DTC I s applie	Sonf Solution FORM CO the voltage ECM + Terminal 139 Spection >> To ch >> To ch >> Conf >> Go to cosis Pro Cosis Pro CCK DTC I P1572 is cont cable DTC	irmation a TO 7. DMPONE e betwee 	after repair: ENT FUNC n ECM hard Brake pedal Brake pedal function syr after repair: . "Diagnosi ? Y with DTC I d?	: ÍNSPE TION C ness co Condition	HECK-II onnectors.	Voltage Battery voltage Approx. 0 V air: Refer to <u>G</u> ND	- - - 	<u>ncident"</u> . ///FOID:000000011939943
NO 7.PER Check t Con- nector E10 S the in YES-1 YES-2 NO Diagno f DTC I	Sonf Solution FORM CO the voltage ECM + Terminal 139 Spection >> To ch >> To ch >> Conf >> Go to cosis Pro Cosis Pro CCK DTC I P1572 is cont cable DTC	irmation a TO 7. DMPONE betwee - - Terminal 152 result nor beck malf irmation a b EC-469 DCEdure PRIORIT displayed C detecte orm diagr	after repair: ENT FUNC n ECM hard Brake pedal Brake pedal function syr after repair: . "Diagnosi ? Y with DTC I d?	: ÍNSPE TION C ness co Condition	HECK-II onnectors.	Voltage Battery voltage Approx. 0 V air: Refer to <u>G</u>	- - - 	<u>ncident"</u> . ///FOID:000000011939943
NO 7.PER Check t Con- nector E10 S the in YES-1 YES-2 NO Diagno f DTC I s applic YES NO	 >> Conf >> GO T FORM CO he voltage ECM + Terminal 139 Ispection >> To ch >> Conf >>	irmation a TO 7. DMPONE betwee - - Terminal 152 result nor neck malf irmation a b <u>EC-469</u> DCedure PRIORIT displayed C detecte Drm diagn TO 2.	after repair: ENT FUNC n ECM hard Brake pedal mal? function syn after repair: . "Diagnosi Y with DTC I d? nosis of app	: ÍNSPE TION C ness co Condition	HECK-II onnectors.	Voltage Battery voltage Approx. 0 V air: Refer to <u>G</u> ND	- - - 	<u>ncident"</u> . ///FOID:000000011939943
NO 7.PER Check t Con- nector E10 S the in YES-1 YES-2 NO Diagno f DTC I s applid YES NO 2.CHE	 >> Conf >> GO T FORM CO he voltage ECM + Terminal 139 Ispection >> To ch >> Conf >>	irmation a TO 7. DMPONE betwee - - Terminal 152 result nor neck malf irmation a b EC-469 DCEdURE PRIORIT displayed C detecte Drm diagn TO 2. RALL FUI	after repair: ENT FUNC n ECM hard Brake pedal Brake pedal function syr after repair: . "Diagnosi ? Y with DTC I d?	: ÍNSPE TION C ness co Condition	HECK-II onnectors.	Voltage Battery voltage Approx. 0 V air: Refer to <u>G</u> ND	- - - 	<u>ncident"</u> . ///FOID:000000011939943

- 2. Select "BRAKE SW1" in "DATA MONITOR" mode with CONSULT.
- 3. Check "BRAKE SW1" indication under the following conditions.

< DTC/CIRCUIT DIAGNOSIS >

Monitor item	Conditior	1	Indication
BRAKE SW1	Brake pedal	Slightly depressed	OFF
		Fully released	ON

Without CONSULT

1. Turn ignition switch ON.

2. Check the voltage between ECM harness connectors.

	ECM				
Connector	+	-	C	Condition	Voltage
Connector	Tern	ninal			
E10	140	152	Brake pedal	Slightly depressed	Approx. 0 V
L10	140	152	Diake peudi	Fully released	Battery voltage

Is the inspection result normal?

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

3.CHECK OVERALL FUNCTION-II

With CONSULT

Check "BRAKE SW2" indication in "DATA MONITOR" mode.

Monitor item	Condition	n	Indication
BRAKE SW2	Brake pedal	Slightly depressed	ON
DIVARE SW2		Fully released	OFF

Without CONSULT

Check the voltage between ECM harness connectors.

	ECM				
Connector	+	-	Co	ondition	Voltage
Connector	Terr	ninal			
E10	139	152	Brake pedal	Slightly depressed	Battery voltage
	139	152	Blake pedal	Fully released	Approx. 0 V

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 7.

4.CHECK BRAKE PEDAL POSITION SWITCH POWER SUPPLY

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	_	Voltage
Connector	Terminal		
E37	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

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5.CHECK BRAKE PEDAL POSITION SWITCH INPUT SIGNAL CIRCUIT

1. Turn ignition switch OFF.

- 2. Disconnect ECM harness connector.
- 3. Check the continuity between brake pedal position switch harness connector and ECM harness connector. EC

Brake pedal p	osition switch		ECM	Oantinu		C
Connector	Terminal	Connecto	or Termir		ty	C
E37	2	E10	140	Existe	t	
4. Also che	eck harness	for short f	to ground a	and short to pow	er.	D
Is the inspec	tion result n	ormal?				
	GO TO 6.	, .				F
•			-		ower in harness or connectors.	
6. CHECK E						
			n. Refer to	EC-473, "Comp	onent Inspection (Brake Pedal Position Switch)".	F
Is the inspec		ormal?				
-	GO TO 7. Poplaco bra	ko nodal	nocition sy	witch Defer to P	R-20, "Exploded View".	
_	•	-	•	UPPLY CIRCUIT	· · · · · · · · · · · · · · · · · · ·	G
			OWER SI			
	ition switch ect stop lam		arness con	nector		Н
					nector and ground.	
	Ū			,	č	
	+					
Stop	lamp relay		_	Voltage		
Connector	Termi	nal				J
E34	1		Ground	Battery voltage		
Is the inspec	tion result n	ormal?			—	
	GO TO 8.					Κ
•			•	or power supply o		
Ö. CHECK S	STOP LAMP	SWITCH	POWER	SUPPLY CIRCU	IT-I	1
	ect stop lam					
	ect stop lam				nnector and ground.	
J. Oneck i	ic voltage b	ctween st				M
	+				-	
Stop	lamp switch		_	Voltage		Ν
Connector	Termi	nal		-		IN
E38	2	(Ground	Battery voltage	-	
Is the inspec	tion result n				-	0
	GO TO 10.					
•	GO TO 9.					
9.CHECK	STOP LAMP	SWITCH	POWER	SUPPLY CIRCU	IT-II	Ρ
1. Disconn	ect stop lam	p relay ha	arness con	inector.		

1. Disconnect stop lamp relay harness connector.

Check the continuity between stop lamp switch harness connector and stop lamp relay harness connector.

< DTC/CIRCUIT DIAGNOSIS >

+		-	_	
Stop lam	p switch	Stop lar	np relay	Continuity
Connector	Terminal	Connector	Terminal	
E38	2	E34	2	Existed

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

10.CHECK STOP LAMP SWITCH GROUND CIRCUIT

Check the continuity between stop lamp switch harness connector and ground.

+	-		
Stop lam	p switch	_	Continuity
Connector	Terminal		
E38	1	Ground	Existed

Is the inspection result normal?

YES >> GO TO 11.

NO >> Perform the trouble diagnosis for power supply circuit.

11.CHECK STOP LAMP SWITCH

Check the stop lamp switch. Refer to EC-473, "Component Inspection (Stop Lamp Switch)".

Is the inspection result normal?

YES >> GO TO 12.

NO >> Replace stop lamp switch. Refer to <u>BR-20, "Exploded View"</u>.

12. CHECK STOP LAMP SWITCH SIGNAL POWER SUPPLY

Check the voltage between stop lamp relay harness connector and ground.

+	-		
Stop lan	np relay	_	Voltage
Connector	Terminal		
E34	3	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 13.

NO >> Perform the trouble diagnosis for power supply circuit.

13.CHECK STOP LAMP SWITCH SIGNAL CIRCUIT

1. Disconnect ECM harness connector.

2. Check the continuity between stop lamp relay harness connector and ECM harness connector.

+		-	_	
Stop lan	ıp relay	EC	CM	Continuity
Connector	Terminal	Connector	Terminal	
E34	5	E10	139	Existed

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

Is the inspection result normal?

YES >> GO TO 14.

NO >> Repair or replace error-detected parts

14.CHECK STOP LAMP RELAY

< DTC/CIRC				
	UIT DIAGNO	SIS >		[VQ35DE]
Check the sto	p lamp relay.	Refer to EC-474, "	Component Inspection (Stop Lamp Re	<u>lay)"</u> .
<u>s the inspect</u>	ion result norr	nal?		
	NSPECTION I			
NO >> R	Replace stop la	amp relay.		
Componer	nt Inspectio	n (Brake Peda	I Position Switch)	INFOID:000000011939944
1.снеск в	RAKE PEDAL	POSITION SWITC	CH-I	
	tion switch OF			
2. Disconne	ct brake peda	I position switch ha		
3. Check the	e continuity be	etween brake peda	position switch terminals under the fo	llowing conditions.
Tanatiaala		O and it an	O castion it.	
Terminals		Condition	Continuity	
1 and 2	Brake pedal	Fully released	Existed	
- 41 1		Slightly depressed	Not existed	
•	<u>ion result norr</u> NSPECTION I			
-	SPECTION E			
-		POSITION SWITC	CH-II	
			tion. Refer to <u>BR-12, "Adjustment"</u> . I position switch terminals under the fo	llowing conditions.
				lie in ig conclusioner
Terminals		Condition	Continuity	
		Fully released	Existed	
	Brake pedal			
1 and 2	Diano podai	Slightly depressed	Not existed	
			Not existed	
s the inspect YES >> II	ion result norr	nal? END	<u> </u>	
s the inspect YES >> II	ion result norr	nal? END	Not existed ch. Refer to <u>BR-20, "Exploded View"</u> .	
s the inspect YES >> II NO >> R	ion result norr NSPECTION I Replace brake	nal? END	ch. Refer to <u>BR-20, "Exploded View"</u> .	INFOID:000000011939945
s the inspect YES >> II NO >> R Componer	ion result norr NSPECTION I Replace brake Int Inspectio	nal? END pedal position swit n (Stop Lamp S	ch. Refer to <u>BR-20, "Exploded View"</u> .	INFOID.000000011939945
s the inspect YES >> II NO >> R Componer 1.CHECK S	ion result norr NSPECTION I Replace brake Int Inspectio	nal? END pedal position swit n (Stop Lamp S WITCH-I	ch. Refer to <u>BR-20, "Exploded View"</u> .	INFOID:000000011939945
s the inspect YES >> II NO >> R Componer I.CHECK S	ion result norr NSPECTION Replace brake It Inspectio TOP LAMP S\ tion switch OF	nal? END pedal position swit n (Stop Lamp \$ WITCH-I F.	ch. Refer to <u>BR-20, "Exploded View"</u> . Switch)	INFOID:000000011939945
s the inspect YES >> If NO >> R Componer .CHECK S ⁻ . Turn ignit	ion result norr NSPECTION I Replace brake It Inspectio TOP LAMP SV tion switch OF	nal? END pedal position swit n (Stop Lamp \$ WITCH-I F. switch harness con	ch. Refer to <u>BR-20, "Exploded View"</u> . Switch) nector.	
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s the inspect YES >> II NO >> R Componer 1.CHECK S ⁻ 1. Turn ignit 2. Disconne	ion result norr NSPECTION I Replace brake It Inspectio TOP LAMP SV tion switch OF	nal? END pedal position swit n (Stop Lamp \$ WITCH-I F. switch harness con	ch. Refer to <u>BR-20, "Exploded View"</u> . Switch) nector.	
s the inspect YES >> II NO >> R Componer 1.CHECK S 1. Turn ignit 2. Disconne 3. Check the Terminals	ion result norr NSPECTION I Replace brake It Inspectio TOP LAMP SV tion switch OF tot stop lamp s e continuity be	nal? END pedal position swit n (Stop Lamp \$ WITCH-I F. switch harness con etween stop lamp s	ch. Refer to <u>BR-20, "Exploded View"</u> . Switch) nector. witch terminals under the following co	
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s the inspect YES >> II NO >> R Componer 1.CHECK S 1. Turn ignit 2. Disconne 3. Check the Terminals 1 and 2 s the inspect YES >> II NO >> G 2.CHECK S	ion result norr NSPECTION I Replace brake It Inspectio TOP LAMP SV tion switch OF et stop lamp s e continuity be Brake pedal ion result norr NSPECTION I SO TO 2. TOP LAMP SV top lamp switch	nal? END pedal position swit n (Stop Lamp S WITCH-I F. switch harness conset etween stop lamp s Condition Fully released Slightly depressed nal? END WITCH-II n installation. Refer	ch. Refer to <u>BR-20, "Exploded View"</u> . Switch) nector. witch terminals under the following con <u>Continuity</u> Not existed	nditions.
$\frac{ s \text{ the inspect}}{ YES >> I } \\ NO >> R \\ Componer \\ 1.CHECK S^{T} \\ 1. CHECK S^{T} \\ 1. Turn ignit \\ 2. Disconner \\ 3. Check the \\ 1 and 2 \\ 1 and 2$	ion result norr NSPECTION I Replace brake It Inspectio TOP LAMP SV tion switch OF et stop lamp s e continuity be Brake pedal ion result norr NSPECTION I SO TO 2. TOP LAMP SV top lamp switch	nal? END pedal position swit n (Stop Lamp S WITCH-I F. switch harness conset etween stop lamp s Condition Fully released Slightly depressed nal? END WITCH-II n installation. Refer	ch. Refer to <u>BR-20, "Exploded View"</u> . Switch) nector. witch terminals under the following col <u>Continuity</u> Not existed <u>Existed</u> to <u>BR-12, "Adjustment"</u> .	nditions.
$\frac{ s \text{ the inspect}}{ YES >> I } \\ NO >> R \\ Componer \\ 1.CHECK S^{T} \\ 1. CHECK S^{T} \\ 1. Turn ignit \\ 2. Disconner \\ 3. Check the \\ 1 and 2 \\ 1 and 2$	ion result norr NSPECTION I Replace brake It Inspectio TOP LAMP SV tion switch OF et stop lamp s e continuity be Brake pedal ion result norr NSPECTION I SO TO 2. TOP LAMP SV top lamp switch	nal? END pedal position swit n (Stop Lamp S WITCH-I F. switch harness conset etween stop lamp s Condition Fully released Slightly depressed nal? END WITCH-II n installation. Refer	ch. Refer to <u>BR-20, "Exploded View"</u> . Switch) nector. witch terminals under the following col <u>Continuity</u> Not existed <u>Existed</u> to <u>BR-12, "Adjustment"</u> .	nditions.

Is the inspection result normal?

Brake pedal

Slightly depressed

Existed

< DTC/CIRCUIT DIAGNOSIS >

YES >> INSPECTION END

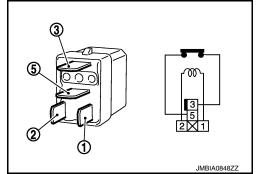
NO >> Replace stop lamp switch. Refer to <u>BR-20, "Exploded View"</u>.

Component Inspection (Stop Lamp Relay)

1.CHECK STOP LAMP RELAY

- 1. Turn ignition switch OFF.
- 2. Remove stop lamp relay.
- 3. Check the continuity between stop lamp relay terminals as per the following conditions.

Stop lamp relay				
+	-	Condition	Continuity	
Terminal				
3 5		12 V direct current supply between terminals 1 and 2	Existed	
		No current supply	Not existed	



Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace stop lamp relay.

[VQ35DE]

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< DTC/CIRCUIT DIAGNOSIS >

P1572 ICC BRAKE SWITCH

DTC Description

DTC DETECTION LOGIC

NOTE:

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.

- 1. When the vehicle speed is above 30 km/h (19 MPH), ON signals from the stop lamp switch and the brake pedal position switch (ICC brake switch) are sent to the ECM at the same time.
- 2. brake pedal position switch (ICC brake switch) signal is not sent to ECM for extremely long time while the vehicle is driving.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition			
P1572	ASCD BRAKE SW (ICC brake switch)		Diagnosis condition	-	
		1	Signal (terminal)	Brake pedal position switch signalStop lamp switch signal	
			Threshold	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	
			Diagnosis delay time	-	
		2	Diagnosis condition	-	
			Signal (terminal)	Brake pedal position switch signal	
			Threshold	Brake pedal position switch signal is not sent to ECM for extremely long time while the ve- hicle is driving	
			Diagnosis delay time	Extremely long time	

POSSIBLE CAUSE

	K
DTC P1572 - 1	
Harness or connectors	
(The stop lamp switch circuit is shorted.)	1
Harness or connectors	
(The brake pedal position switch circuit is shorted.)	
Stop lamp switch	
Brake pedal position switch	M
ICC brake hold relay	
Incorrect stop lamp switch installation	
Incorrect brake pedal position switch installation	
• ECM	N
DTC P1572 - 2	
Harness or connectors	0
(The stop lamp switch circuit is shorted.)	
Harness or connectors	
(The brake pedal position switch circuit is shorted.)	
Stop lamp switch	Р
Brake pedal position switch	
ICC brake hold relay	
Incorrect stop lamp switch installation	
Incorrect brake pedal position switch installation	
• ECM	

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< DTC/CIRCUIT DIAGNOSIS >

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P1572 is displayed with DTC P0605, first perform the confirmation procedure for DTC P0605.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to <u>EC-415</u>, "DTC Description".

NO >> GO TO 2.

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 1-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:

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-477, "Diagnosis Procedure".

NO >> GO TO 4.

4.PERFORM DTC CONFIRMATION PROCEDURE 1-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-477, "Diagnosis Procedure".

NO-1 >> To check malfunction symptom before repair: Refer to GI-41, "Intermittent Incident".

NO-2 >> Confirmation after repair: INSPECTION END

< DTC/CIRCUIT DIAGNOSIS >

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1. CHECK DTC PRIORITY

Diagnosis Procedure

If DTC P1572 is displayed with DTC P0605, first perform the confirmation procedure for DTC P0605.					
<u>Is appli</u>	cable DTC detected?				
YES	>> Perform diagnosis of applicable. Refer to <u>EC-415, "DTC Description"</u> .				
NO	>> GO TO 2.				

2. CHECK OVERALL FUNCTION-I

(B) 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	(Indication	
BRAKE SW1	Brake pedal	Slightly depressed	OFF
(ICC brake switch)	Brake pedal	Fully released	ON

Without CONSULT

1. Turn ignition switch ON.

2	Check the voltage h	etween ECM harness	connector terminals	under the f	ollowing conditions
∠.	CHECK THE VUILAGE D	EIMEEN LOW Harness			Unowing conditions.

ECM					
Connector	+	-	Condition Voltage (Voltage (V)
Connector	Terminal	Terminal			
540	140	152	Brake pedal	Slightly depressed	Approx. 0
E10	140		Brake pedal	Fully released	Battery voltage
Is the inspe	ection result normal?				
YES >:	> GO TO 3.				
NO >> GO TO 4.					

3.CHECK OVERALL FUNCTION-II

(B) With CONSULT

Select "BRAKE SW2" and check indication under the following conditions.

Monitor item	(Condition	Indication
BRAKE SW2	Brake pedal	Slightly depressed	ON
(Stop lamp switch)	Diake peudi	Fully released	OFF

Without CONSULT

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

ECM						
Connector	+ –		Condition Voltage (V)		Voltage (V)	
Connector	Terminal	Terminal				
E10	139	152	Brake	Slightly depressed	Battery voltage	
L 10	139		pedal	Fully released	Approx. 0	

Is the inspection result normal?

YES >> INSPECTION END NO >> GO TO 7.

< DTC/CIRCUIT DIAGNOSIS >

4.CHECK BRAKE PEDAL POSITION SWITCH POWER SUPPLY

- 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 p	position switch	_	Voltage
Connector	Terminal		
E37	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 5.

NO >> Perform the trouble diagnosis for power supply circuit.

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 p	osition switch	E	СМ	Continuity
Connector	Terminal	Connector	Terminal	Continuity
E37	2	E10	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 or replace error-detected parts.

6.CHECK BRAKE PEDAL POSITION SWITCH

Check brake pedal position switch. Refer to EC-480, "Component Inspection (ICC Brake Switch)".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace brake pedal position switch. Refer to <u>BR-20, "Removal and Installation"</u>.

I.CHECK STOP LAMP RELAY POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.

2. Disconnect stop lamp relay harness connector.

3. Check the voltage between stop lamp relay harness connector and ground.

+	+		
Stop lan	np relay	_	Voltage
Connector	Terminal		
E34	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 8.

NO >> Perform the trouble diagnosis for power supply circuit.

8.CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT-I

1. Reconnect stop lamp relay harness connector.

2. Disconnect stop lamp switch harness connector.

3. Check the voltage between stop lamp switch harness connector and ground.

< DTC/CIRCUIT DIAGNOSIS >

	+					-								
Stop la	amp switch		_		Voltage									
Connector	Termi	nal												
E38	2		Groun	nd	Battery voltage	_								
s the inspecti	<u>ion result n</u>	ormal?												
	GO TO 10.													
	GO TO 9.													
J. CHECK S	TOP LAMP	SWITC	CH PO	WER S	UPPLY CIRCU	JIT-II	I							
	ect stop lam e continuity				nector. switch harness	s con	nne	ector	and st	op lar	np re	lay ha	irness	conneo
+			_			-								
Stop lamp	switch	St	top lamp	o relay	Continuity									
Connector	Terminal	Conne	ector	Termin	al									
E38	2	E34	4	2	Existed	_								
3. Also cheo	ck harness	for shor	rt to gr	ound a	nd to power.									
YES >> IN	NSPECTIO													
10.снеск	Repair or reposition STOP LAM	place er /IP SWI1	rror-de TCH G	ROUN	D CIRCUIT									
10.снеск	Repair or reposition STOP LAM	place er /IP SWI1	rror-de TCH G	ROUN	•	necto	tor	and g	Jround	<u> </u>				
10.снеск	Repair or reposition of the Repair or reposition of the Repair of the Re	place er /IP SWI1	rror-de TCH G	ROUN	D CIRCUIT	necto	tor	and g	ground					
10.CHECK Check the co	Repair or rep STOP LAM ntinuity betw +	place er /IP SWI1	rror-de TCH G	ROUN	D CIRCUIT ch harness conr	necto	tor	and g	ground					
10.CHECK Check the cor Stop la	Repair or rep STOP LAM ntinuity betw + amp switch	place er /IP SWIT ween sto	rror-de TCH G	ROUN	D CIRCUIT	inecto	tor	and g	ground					
10.CHECK Check the con Stop la Connector	Repair or rep STOP LAM ntinuity betw + amp switch Termin	place er /IP SWIT ween sto	rror-de TCH G top lan	ROUN	D CIRCUIT ch harness conr Continuity	inecto	tor	and g	ground					
10.CHECK Check the cor Stop la Connector E38	Repair or rep STOP LAM ntinuity betw + amp switch Termin 1	place er /IP SWIT ween sto	rror-de TCH G top lan - Grou	ROUN	D CIRCUIT ch harness conr	inecto -	tor	and (ground					
10.CHECK Check the con Stop la Connector E38 Is the inspecti	Repair or rep STOP LAM ntinuity betw + amp switch Termin 1 ion result n	place er /IP SWIT ween sto	rror-de TCH G top lan - Grou	ROUN	D CIRCUIT ch harness conr Continuity		tor	and ç	ground	<u>.</u>				
10.CHECK Check the con Stop la Connector E38 Is the inspection YES >> G	Repair or rep STOP LAM ntinuity betw + amp switch Termin 1 ion result n GO TO 11.	place er /IP SWIT ween sto nal ormal?	rror-de TCH G top lan - - Grou	BROUN	D CIRCUIT ch harness conr Continuity	- -		and (ground					
10.CHECK Check the con Stop la Connector E38 Is the inspection YES >> G	Repair or rep STOP LAM ntinuity betw + amp switch Termin 1 ion result n GO TO 11. Perform the	place er /IP SWIT ween sto nal ormal? trouble	rror-de TCH G top lan Grou	BROUN	D CIRCUIT ch harness conr Continuity Existed	- -		and (ground	<u>.</u>				
10.CHECK Check the cor Stop la Connector E38 Sthe inspect YES >> G NO >> P 11.CHECK	Repair or rep STOP LAM ntinuity betw + amp switch Termin 1 ion result n GO TO 11. Perform the STOP LAM	place er /IP SWIT ween sto nal ormal? trouble IP SWIT	rror-de TCH G top lan Grou Grou TCH	BROUN np swite	D CIRCUIT ch harness conr Continuity Existed	- - circui	uit.				witch	 		
10.CHECK Check the cor Stop la Connector E38 Sthe inspect YES >> G NO >> P 11.CHECK	Repair or rep STOP LAM ntinuity betw + amp switch ion result n GO TO 11. Perform the STOP LAM	place er /IP SWIT ween sto nal ormal? trouble IP SWIT	rror-de TCH G top lan Grou diagno TCH fer to <u>F</u>	BROUN np swite	D CIRCUIT ch harness conr Continuity Existed	- - circui	uit.				witch	<u></u> .		
10.CHECK Check the cor Stop la Connector E38 Is the inspecti YES >> G NO >> P 11.CHECK Check the stop	Repair or rep STOP LAM ntinuity betw + amp switch ion result n GO TO 11. Perform the STOP LAM	place er /IP SWIT ween sto nal ormal? trouble IP SWIT	rror-de TCH G top lan Grou diagno TCH fer to <u>F</u>	BROUN np swite	D CIRCUIT ch harness conr Continuity Existed	- - circui	uit.				witch	<u>)"</u> .		
10.CHECK Check the cor Stop la Connector E38 S the inspecti YES >> G NO >> P 11.CHECK Check the sto s the inspecti YES >> G NO >> R	Repair or report of report of report of report of the second seco	place er /IP SWIT ween sto nal ormal? trouble IP SWIT itch. Ref ormal? p lamp s	rror-de TCH G top lan Grou Grou TCH fer to <u>F</u> switch	BROUN The switch and osis for EC-480 . Refer	D CIRCUIT ch harness conr Continuity Existed power supply c . "Component I to <u>BR-20. "Exp</u>	- circui Inspe	uit.	tion (S	Stop La		witch	<u></u> .		
10.CHECK Check the cor Stop la Connector E38 S the inspecti YES >> G NO >> P 11.CHECK Check the sto s the inspecti YES >> G NO >> R	Repair or report of report of report of report of the second seco	place er /IP SWIT ween sto nal ormal? trouble IP SWIT itch. Ref ormal? p lamp s	rror-de TCH G top lan Grou Grou TCH fer to <u>F</u> switch	BROUN The switch and osis for EC-480 . Refer	D CIRCUIT ch harness conr Continuity Existed power supply c . "Component I to <u>BR-20. "Exp</u>	- circui Inspe	uit.	tion (S	Stop La		witch	<u>ມ"</u> .		
10.CHECK Check the cor Stop la Connector E38 Sthe inspection YES $>> G$ NO $>> P$ 11.CHECK Check the stop is the inspection YES $>> G$ NO $>> R$ 12.CHECK	Repair or rep STOP LAM ntinuity betw + amp switch ion result n GO TO 11. Perform the STOP LAM p lamp swi ion result n GO TO 12. Replace stop STOP LAM	place er /IP SWIT ween sto nal ormal? trouble IP SWIT itch. Ref ormal? p lamp s /IP SWIT	rror-de TCH G top lan Grou diagne TCH fer to <u>f</u> switch TCH S	BROUN The switch and osis for EC-480 CREFER BIGNAL	D CIRCUIT ch harness conr Continuity Existed power supply c	- circui Inspe	uit. ect	tion (S	<u>Stop La</u>		witch	<u>ı)"</u> .		
10.CHECK Check the cor Stop la Connector E38 Sthe inspection YES $>> G$ NO $>> P$ 11.CHECK Check the stop is the inspection YES $>> G$ NO $>> R$ 12.CHECK	Repair or rep STOP LAM ntinuity betw + amp switch ion result n GO TO 11. Perform the STOP LAM p lamp swi ion result n GO TO 12. Replace stop STOP LAM	place er /IP SWIT ween sto nal ormal? trouble IP SWIT itch. Ref ormal? p lamp s /IP SWIT	rror-de TCH G top lan Grou diagne TCH fer to <u>f</u> switch TCH S	BROUN The switch and osis for EC-480 CREFER BIGNAL	D CIRCUIT ch harness conr Continuity Existed power supply c ."Component I to <u>BR-20, "Exp</u> POWER SUPF	- circui Inspe	uit. ect	tion (S	<u>Stop La</u>		witch	<u>)"</u> .		
10.CHECK Check the cor Stop la Connector E38 Sthe inspection YES $>> G$ NO $>> P$ 11.CHECK Check the stop is the inspection YES $>> G$ NO $>> R$ 12.CHECK	Repair or rep STOP LAM ntinuity betw + amp switch ion result n GO TO 11. Perform the STOP LAM p lamp swi ion result n GO TO 12. Replace stop STOP LAM	place er /IP SWIT ween sto nal ormal? trouble IP SWIT itch. Ref ormal? p lamp s /IP SWIT	rror-de TCH G top lan Grou diagne TCH fer to <u>f</u> switch TCH S	BROUN The switch and osis for EC-480 CREFER BIGNAL	D CIRCUIT ch harness conr Continuity Existed power supply c ."Component I to <u>BR-20, "Exp</u> POWER SUPF	- circui Inspe	uit. ect	tion (S	<u>Stop La</u>		witch	<u>)"</u> .		
10.CHECK Check the cor Stop la Connector E38 Is the inspect YES >> G NO >> P 11.CHECK Check the stop Sthe inspect YES >> G NO >> R 12.CHECK Check the vol	Repair or rep STOP LAM ntinuity betw + amp switch Termin ion result n GO TO 11. Perform the STOP LAM pop lamp swi ion result n GO TO 12. Replace stop STOP LAM Itage betwe	place er /IP SWIT ween sto nal ormal? trouble IP SWIT itch. Ref ormal? p lamp s /IP SWIT	rror-de TCH G top lan Grou diagne TCH fer to <u>f</u> switch TCH S	BROUN The switch and osis for EC-480 CREFER BIGNAL	D CIRCUIT ch harness conr Continuity Existed power supply c ."Component I to <u>BR-20, "Exp</u> POWER SUPF	- circui Inspe	uit. ect	tion (S	<u>Stop La</u>		witch	<u>)"</u> .		
10.CHECK Check the cor Stop la Connector E38 Is the inspect YES >> G NO >> P 11.CHECK Check the stop Sthe inspect YES >> G NO >> R 12.CHECK Check the vol	Repair or rep STOP LAM ntinuity betw + amp switch ion result n GO TO 11. Perform the STOP LAM op lamp swi ion result n GO TO 12. Replace stop STOP LAM Itage betwe	place er /IP SWIT ween sto nal ormal? trouble IP SWIT itch. Ref ormal? p lamp s /IP SWIT een stop	rror-de TCH G top lan Grou diagne TCH fer to <u>f</u> switch TCH S	BROUN The switch and osis for EC-480 CREFER BIGNAL	D CIRCUIT ch harness conr Continuity Existed power supply c ."Component I to <u>BR-20, "Exp</u> POWER SUPF arness connect	- circui Inspe	uit. ect	tion (S	<u>Stop La</u>		witch	<u></u> .		

Is the inspection result normal?

YES >> GO TO 13.

NO >> Perform the trouble diagnosis for power supply circuit.

13. CHECK STOP LAMP SWITCH SIGNAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

1. Disconnect ECM harness connector.

2. Check the continuity between stop lamp relay harness connector and ECM harness connector.

+		-		
Stop lan	np relay	EC	CM	Continuity
Connector	Terminal	Connector	Terminal	
E34	5	E10	139	Existed

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

Is the inspection result normal?

YES >> GO TO 14.

NO >> Repair or replace error-detected parts

14.CHECK STOP LAMP RELAY

Check the stop lamp relay. Refer to EC-481, "Component Inspection (Stop Lamp Relay)".

Is the inspection result normal?

YES >> Check ICC brake hold relay circuit. Refer to DAS-44, "Diagnosis Procedure".

NO >> Replace stop lamp relay.

Component Inspection (ICC Brake Switch)

INFOID:000000011939948

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	
1 and 2	Brake pedal	Fully released	Existed
i anu z	Diake peual	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-12, "Adjustment"</u>.
- 2. Check the continuity between brake pedal position switch terminals under the following conditions.

Terminals	C	Condition	Continuity
1 and 2	Brake pedal	Fully released	Existed
i anu z	Diake pedai	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)

INFOID:0000000011939949

1.CHECK STOP LAMP SWITCH-I

1. Turn ignition switch OFF.

2. Disconnect stop lamp switch harness connector.

3. Check the continuity between stop lamp switch terminals under the following conditions.

< DTC/CIRCUIT DIAGNOSIS >

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Terreiterelt		Condition		-	
Terminals			Continuity	_	
1 and 2	Brake pedal	Fully released	Not existed	_	
		Slightly depressed	Existed	_	
the inspec	tion result norn	<u>nal?</u>			
	NSPECTION E GO TO 2.	END			
CHECK S	STOP LAMP SV	VITCH-II			
		installation. Refer to <u>BR-</u> tween stop lamp switch te			
Check th		· ·		_	
Terminals		Condition	Continuity	_	
	1 and 2 Brake pedal Fully released		Not existed		
1 and 2					
		Slightly depressed	Existed	-	
the inspec	Brake pedal tion result norn	nal?	Existed	-	
the inspec YES >>	tion result norn	nal?			
the inspec YES >> NO >>	tion result norn NSPECTION E Replace stop la	nal? ND mp switch. Refer to <u>BR-20</u>	0, "Exploded V	- - iew".	INFQID:00000001246
the inspec YES >> NO >>	tion result norn NSPECTION E Replace stop la nt Inspectio	nal? END Imp switch. Refer to <u>BR-20</u> n (Stop Lamp Relay)	0, "Exploded V	- - iew".	INFOID:00000001246
the inspec YES >> NO >>	tion result norn NSPECTION E Replace stop la	nal? END Imp switch. Refer to <u>BR-20</u> n (Stop Lamp Relay)	0, "Exploded V		INFOID:00000001246
the inspec YES >> NO >> Compone .CHECK S	tion result norm NSPECTION E Replace stop la nt Inspection STOP LAMP RE ition switch OF	nal? END Imp switch. Refer to <u>BR-20</u> n (Stop Lamp Relay) ELAY	0, "Exploded V		INFOID:00000001246
the inspec YES >> NO >> OMPONE .CHECK S Turn ign Remove	tion result norm NSPECTION E Replace stop la nt Inspection STOP LAMP RE ition switch OF stop lamp rela	nal? END Imp switch. Refer to <u>BR-20</u> n (Stop Lamp Relay) ELAY F.	0, "Exploded V		INFOID:00000001246
the inspec YES >> NO >> COMPONE .CHECK S Turn ign Remove Check th	tion result norm NSPECTION E Replace stop la nt Inspection STOP LAMP RE ition switch OF stop lamp rela	nal? END Imp switch. Refer to <u>BR-20</u> n (Stop Lamp Relay) ELAY F. y. etween stop lamp relay te	0, "Exploded V		INFOID:000000001246
the inspec YES >> NO >> OMPONE .CHECK S Turn ign Remove Check th	tion result norm NSPECTION E Replace stop la nt Inspection STOP LAMP RE ition switch OF stop lamp rela ne continuity be	nal? END Imp switch. Refer to <u>BR-20</u> n (Stop Lamp Relay) ELAY F. y. etween stop lamp relay te	0, "Exploded V		INFOID:00000001246
the inspec YES >> NO >> COMPONE .CHECK S . Turn ign . Remove . Check the che	tion result norm NSPECTION E Replace stop la nt Inspection STOP LAMP RE ition switch OF stop lamp rela ne continuity be wing conditions	nal? END Imp switch. Refer to <u>BR-20</u> n (Stop Lamp Relay) ELAY F. y. etween stop lamp relay te	0, "Exploded V	3	INFOID:00000001246
the inspec YES >> NO >> Ompone .CHECK S Turn ign Remove Check the the follor	tion result norm NSPECTION E Replace stop la nt Inspection STOP LAMP RE ition switch OF stop lamp rela ne continuity be wing conditions	nal? END Imp switch. Refer to <u>BR-20</u> n (Stop Lamp Relay) ELAY F. y. etween stop lamp relay te	0, "Exploded V		
the inspec YES >> NO >> Ompone .CHECK S Turn ign Remove Check the the follow Stop lamp rel	tion result norm NSPECTION E Replace stop la nt Inspection STOP LAMP RE ition switch OF stop lamp rela ne continuity be wing conditions	nal? END Imp switch. Refer to <u>BR-20</u> In (Stop Lamp Relay) ELAY F. y. etween stop lamp relay te	D. "Exploded V) erminals as pe	3	
the inspec YES >> NO >> COMPONE CHECK S Turn ign Remove Check ti the follor Stop lamp rel +	tion result norm NSPECTION E Replace stop la nt Inspection STOP LAMP RE stop lamp rela ne continuity be wing conditions	nal? END Imp switch. Refer to <u>BR-20</u> In (Stop Lamp Relay) ELAY F. y. etween stop lamp relay te	D. "Exploded V) erminals as pe	3	

YES >> INSPECTION END

NO >> Replace stop lamp relay.

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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 EC-41, "AUTOMATIC SPEED CONTROL DEVICE (ASCD) : System Description" for ASCD functions.

DTC Description

INFOID:000000011939952

DTC DETECTION LOGIC

The difference the between two vehicle speed signals is out of the specified range.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
		Diagnosis condition	Start engine and drive the vehicle at more than 40 km/h (25 MPH)
P1574	ASCD VHL SPD SEN	Signal (terminal)	—
F 1374	(ASCD vehicle speed sensor)	Threshold	The difference the between two vehicle speed signals is out of the specified range
		Diagnosis delay time	—

POSSIBLE CAUSE

- Harness or connectors
- (The CAN communication line is open or shorted.)
- Combination meter
- ABS actuator and electric unit (control unit)
- Wheel sensor
- TCM
- ECM

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P1574 is displayed with DTC UXXXX, P0500, P0605 or P0607, first perform the confirmation procedure for DTC UXXXX, P0500, P0605 or P0607.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable.
 - DTC UXXXX: Refer to <u>EC-107</u>, "<u>DTC Index</u>".
 DTC P0500: Refer to <u>EC-386</u>, "<u>Description</u>".
 - DTC P0605: Refer to <u>EC-415</u>, "DTC Description".
 - DTC P0607: Refer to EC-419, "DTC Description".
- NO >> GO TO 2.

2. PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following 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.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine (VDC switch OFF). INFOID:000000011939951

P1574 ASCD VEHICLE SPEED SENSOR

P15/4 ASCD VEHICLE SPEED SENSOR	
< DTC/CIRCUIT DIAGNOSIS > [VQ35D	E]
2. Drive the vehicle at more than 40 km/h (25 MPH).	
CAUTION: Always drive vehicle at a safe speed.	A
NOTE:	
This procedure may be conducted with the drive wheels lifted in the shop or by driving the vehic	e. EC
If a road test is expected to be easier, it is unnecessary to lift the vehicle. 3. Check DTC.	
Is DTC detected?	
YES >> Proceed to EC-483, "Diagnosis Procedure".	С
NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-41, "Intermittent Incident"</u> .	
NO-2 >> Confirmation after repair: INSPECTION END	D
Diagnosis Procedure	39953
1. CHECK DTC PRIORITY	
If DTC P1574 is displayed with DTC UXXXX, P0500, P0605 or P0607, first perform the confirmation pro-	E
dure for DTC UXXXX, P0500, P0605 or P0607.	LE-
Is applicable DTC detected?	F
YES >> Perform diagnosis of applicable.	
 DTC UXXXX: Refer to <u>EC-107, "DTC_Index"</u>. DTC P0500: Refer to <u>EC-386, "Description"</u>. 	
DTC P0605: Refer to <u>EC-415, "DTC Description"</u> .	G
DTC P0607: Refer to <u>EC-419, "DTC Description"</u> .	
NO >> GO TO 2.	Н
Check DTC with TCM. Refer to <u>TM-42. "CONSULT Function"</u> .	
<u>Is the inspection result normal?</u> YES >> GO TO 3.	I
NO >> Perform trouble shooting relevant to DTC indicated.	
$\tilde{3}$. CHECK DTC WITH ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)	J
Check DTC with ABS actuator and electric unit (control unit). Refer to BRC-41, "CONSULT Function" (with	out
ICC), <u>BRC-212, "CONSULT Function"</u> (with ICC).	K
Is the inspection result normal?	IX.
YES >> GO TO 4. NO >> Repair or replace malfunctioning part.	
4. CHECK COMBINATION METER FUNCTION	L
Check combination meter function. Refer to <u>MWI-20, "CONSULT Function (METER/M&A)"</u> .	Μ
>> INSPECTION END	1 7 1
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< DTC/CIRCUIT DIAGNOSIS >

P1574 ICC 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 ICC control. Refer to <u>CCS-11</u>, "System Description" for ICC functions.

DTC Description

INFOID:000000011939955

INFOID:000000011939954

DTC DETECTION LOGIC

The difference the between two vehicle speed signals is out of the specified range.

DTC	CONSULT screen terms (Trouble diagnosis content)	DT	C detection condition
		Diagnosis condition	Start engine and drive the vehicle at more than 40 km/h (25 MPH)
P1574	ASCD VHL SPD SEN	Signal (terminal)	—
F 13/4	(ICC vehicle speed sensor)	Threshold	The difference the between two vehicle speed signals is out of the specified range
		Diagnosis delay time	—

POSSIBLE CAUSE

- Harness or connectors
- (The CAN communication line is open or shorted.)
- Combination meter
- ABS actuator and electric unit (control unit)
- Wheel sensor
- TCM
- ECM

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P1574 is displayed with DTC UXXXX, P0500, P0605 or P0607, first perform the confirmation procedure for DTC UXXXX, P0500, P0605 or P0607.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable.
 - DTC UXXXX: Refer to <u>EC-107, "DTC Index"</u>.
 - DTC P0500: Refer to EC-386, "Description".
 - DTC P0605: Refer to EC-415, "DTC Description".
 - DTC P0607: Refer to <u>EC-419</u>, "DTC Description".

NO >> GO TO 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.

>> GO TO 3.

3. PERFORM DTC CONFIRMATION PROCEDURE

- 1. Start engine (VDC switch OFF).
- 2. Drive the vehicle at more than 40 km/h (25 MPH).

P1574 ICC VEHICLE SPEED SENSOR

< DTC/CIRCUIT DIAGNOSIS > [VQ35DE]	
CAUTION: Always drive vehicle at a safe speed.	A
 NOTE: This procedure may be conducted with the drive wheels lifted in the shop or by driving the vehicle If a road test is expected to be easier, it is unnecessary to lift the vehicle. Check DTC. 	EC
Is DTC detected?YES>> Proceed to EC-485, "Diagnosis Procedure".NO-1>> To check malfunction symptom before repair: Refer to GI-41, "Intermittent Incident".NO-2>> Confirmation after repair: INSPECTION END	С
Diagnosis Procedure	i6 D
1.CHECK DTC PRIORITY	
If DTC P1574 is displayed with DTC UXXXX, P0500, P0605 or P0607, first perform the confirmation proce dure for DTC UXXXX, P0500, P0605 or P0607.	- E
<u>Is applicable DTC detected?</u> YES >> Perform diagnosis of applicable. • DTC UXXXX: Refer to <u>EC-107, "DTC Index"</u> .	F
 DTC P0500: Refer to <u>EC-386, "Description"</u>. DTC P0605: Refer to <u>EC-415, "DTC Description"</u>. DTC P0607: Refer to <u>EC-419, "DTC Description"</u>. NO >> GO TO 2. 	G
2. CHECK DTC WITH TCM	Н
Check DTC with TCM. Refer to TM-42, "CONSULT Function".	-
<u>Is the inspection result normal?</u> YES >> GO TO 3. NO >> Perform trouble shooting relevant to DTC indicated.	I
NO >> Perform trouble shooting relevant to DTC indicated. 3.CHECK DTC WITH ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)	
Check DTC with ABS actuator and electric unit (control unit). Refer to <u>BRC-41. "CONSULT Function"</u> (withou ICC), <u>BRC-212. "CONSULT Function"</u> (with ICC).	t
<u>Is the inspection result normal?</u> YES >> GO TO 4.	K
NO >> Repair or replace malfunctioning part.	
4. CHECK COMBINATION METER FUNCTION	L
Check combination meter function. Refer to <u>MWI-20, "CONSULT Function (METER/M&A)"</u> .	-
>> INSPECTION END	M
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< DTC/CIRCUIT DIAGNOSIS >

P1700 CVT CONTROL SYSTEM

Description

INFOID:000000011939959

[VQ35DE]

This DTC is displayed with other DTC regarding TCM. Perform the trouble diagnosis for corresponding DTC. Refer to <u>EC-107</u>. "<u>DTC Index</u>". When this DTC is detected, the ASCD control is canceled.

P1800 VIAS CONTROL SOLENOID VALVE 1

< DTC/CIRCUIT DIAGNOSIS >

P1800 VIAS CONTROL SOLENOID VALVE 1

DTC Description

А

EC

INFOID:000000011939963

[VQ35DE]

DTC DETECTION LOGIC

An excessively low or high voltage signal is sent to ECM through the VIAS control solenoid valve 1.

Internation sent to ECM Diagnosis delay time	DTC	CONSULT screen terms (Trouble diagnosis content)	DT	C detection condition
P1800 VIAS SV CIRC-B1 (VIAS solenoid valve circuit bank 1) Threshold An excessively low or high voltage signal is sent to ECM POSSIBLE CAUSE			Diagnosis condition	Start engine and let it idle
P1800 (VIAS solenoid valve circuit bank 1) Threshold An excessively low or high voltage signal is sent to ECM POSSIBLE CAUSE			Signal (terminal)	VIAS control solenoid valve 1 signal
POSSIBLE CAUSE Harness or connectors (Input speed sensor circuit is open or shorted) VIAS control solenoid valve 1 FAIL-SAFE Not applicable DTC CONFIRMATION PROCEDURE 1. CONDITIONING If DTC Confirmation Procedure has been previously conducted, always perform the following before condu ing the next test. 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. SGO TO 2. PERFORM DTC CONFIRMATION PROCEDURE Seconds. Check 1st trip DTC. Is 1st trip DTC detected? YES >> Proceed to EC-487. "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 Cuestion of the solenoid valve 1 harness connector. Cuestion of the voltage between VIAS control solenoid valve 1 harness connector and ground.	P1800		Threshold	An excessively low or high voltage signal is sent to ECM
 VIAS control solenoid valve 1 FAIL-SAFE Not applicable DTC CONFIRMATION PROCEDURE 1. CONDITIONING If DTC Confirmation Procedure has been previously conducted, always perform the following before conduing the next test. 1. Turn ignition switch OFF and wait at least 10 seconds. 2. Turn ignition switch OFF and wait at least 10 seconds. Turn ignition switch OFF and wait at least 10 seconds. Turn ignition switch OFF and wait at least 10 seconds. 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 5 seconds. 2. Check 1st trip DTC. Is 1st trip DTC detected? YES >> Proceed to EC-487, "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 Acheck VIAS CONTROL SOLENOID VALVE 1 POWER SUPPLY 1. Turn ignition switch OFF. 2. Disconnect VIAS control solenoid valve 1 harness connector. 3. Turn ignition switch ON. 4. Check the voltage between VIAS control solenoid valve 1 harness connector and ground. 			Diagnosis delay time	_
Not applicable DTC CONFIRMATION PROCEDURE 1.CONDITIONING If DTC Confirmation Procedure has been previously conducted, always perform the following before conduing the next test. 1. 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 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 5 seconds. 2. Check 1st trip DTC. Is 1st trip DTC detected? YES >> Proceed to EC-487. "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 1. Turn ignition switch OFF. 2. Disconnect VIAS CONTROL SOLENOID VALVE 1 POWER SUPPLY 1. Turn ignition switch OFF. 2. Disconnect VIAS control solenoid valve 1 harness connector. 3. Turn ignition switch OFF.	 Harness c (Input spe VIAS cont 	or connectors ed sensor circuit is open or short rol solenoid valve 1	ed)	
If DTC Confirmation Procedure has been previously conducted, always perform the following before condu- ing the next test. 1. Turn ignition switch OFF and wait at least 10 seconds. 2. Turn ignition switch OFF and wait at least 10 seconds. TESTING CONDITION: Before performing the following procedure, confirm battery voltage is more than 11 V at idle. >> GO TO 2. 2.PERFORM DTC CONFIRMATION PROCEDURE 1. Start engine and let it idle for at least 5 seconds. 2. Check 1st trip DTC. Is 1st trip DTC detected? YES >> Proceed to EC-487. "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 1. CHECK VIAS CONTROL SOLENOID VALVE 1 POWER SUPPLY 1. Turn ignition switch OFF. 2. Disconnect VIAS control solenoid valve 1 harness connector. 3. Turn ignition switch ON. 4. Check the voltage between VIAS control solenoid valve 1 harness connector and ground.	-			
If DTC Confirmation Procedure has been previously conducted, always perform the following before condu- ing the next test. 1. Turn ignition switch OFF and wait at least 10 seconds. 2. Turn ignition switch OFF and wait at least 10 seconds. TESTING CONDITION: Before performing the following procedure, confirm battery voltage is more than 11 V at idle. >> GO TO 2. 2.PERFORM DTC CONFIRMATION PROCEDURE 1. Start engine and let it idle for at least 5 seconds. 2. Check 1st trip DTC. Is 1st trip DTC detected? YES >> Proceed to EC-487. "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 1. CHECK VIAS CONTROL SOLENOID VALVE 1 POWER SUPPLY 1. Turn ignition switch OFF. 2. Disconnect VIAS control solenoid valve 1 harness connector. 3. Turn ignition switch ON. 4. Check the voltage between VIAS control solenoid valve 1 harness connector and ground.	DTC CONF	-IRMATION PROCEDURE		
ing the next test. Turn ignition switch OFF and wait at least 10 seconds. Turn ignition switch OFF and wait at least 10 seconds. 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 5 seconds. 2. Check 1st trip DTC. Is 1st trip DTC detected? YES >> Proceed to EC-487, "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 1.CHECK VIAS CONTROL SOLENOID VALVE 1 POWER SUPPLY 1. Turn ignition switch OFF. 2. Disconnect VIAS control solenoid valve 1 harness connector. 3. Turn ignition switch ON. 4. Check the voltage between VIAS control solenoid valve 1 harness connector and ground.	1.CONDIT	IONING		
 2.PERFORM DTC CONFIRMATION PROCEDURE Start engine and let it idle for at least 5 seconds. Check 1st trip DTC. Is 1st trip DTC detected? YES >> Proceed to EC-487. "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 I.CHECK VIAS CONTROL SOLENOID VALVE 1 POWER SUPPLY Turn ignition switch OFF. Disconnect VIAS control solenoid valve 1 harness connector. Turn ignition switch ON. Check the voltage between VIAS control solenoid valve 1 harness connector and ground. 	TESTING C Before per	ONDITION: forming the following procedur		ge is more than 11 V at idle.
 2. Check 1st trip DTC. <u>Is 1st trip DTC detected?</u> YES >> Proceed to <u>EC-487. "Diagnosis Procedure"</u>. NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-41. "Intermittent Incident"</u>. NO-2 >> Confirmation after repair: INSPECTION END Diagnosis Procedure I.CHECK VIAS CONTROL SOLENOID VALVE 1 POWER SUPPLY 1. Turn ignition switch OFF. 2. Disconnect VIAS control solenoid valve 1 harness connector. 3. Turn ignition switch ON. 4. Check the voltage between VIAS control solenoid valve 1 harness connector and ground. 	~		EDURE	
 CHECK VIAS CONTROL SOLENOID VALVE 1 POWER SUPPLY Turn ignition switch OFF. Disconnect VIAS control solenoid valve 1 harness connector. Turn ignition switch ON. Check the voltage between VIAS control solenoid valve 1 harness connector and ground. 	2. Check <u>Is 1st trip D</u> YES >> NO-1 >>	1st trip DTC. <u>TC detected?</u> Proceed to <u>EC-487, "Diagnosis F</u> To check malfunction symptom b	P <u>rocedure"</u> . efore repair: Refer to <u>GI-4</u>	41, "Intermittent Incident".
 Turn ignition switch OFF. Disconnect VIAS control solenoid valve 1 harness connector. Turn ignition switch ON. Check the voltage between VIAS control solenoid valve 1 harness connector and ground. 	Diagnosis	s Procedure		INFOID:000000011939964
 Disconnect VIAS control solenoid valve 1 harness connector. Turn ignition switch ON. Check the voltage between VIAS control solenoid valve 1 harness connector and ground. 	1.снеск	VIAS CONTROL SOLENOID VAI	VE 1 POWER SUPPLY	
+	 Disconr Turn igr 	nect VIAS control solenoid valve ² nition switch ON.		connector and ground.
		+		

VIAS control s	+ VIAS control solenoid valve 1		Voltage
Connector	Terminal		
F63	1	Ground	Battery voltage

P1800 VIAS CONTROL SOLENOID VALVE 1

< DTC/CIRCUIT DIAGNOSIS >

YES >> GO TO 2.

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

2. CHECK VIAS CONTROL SOLENOID VALVE 1 OUTPUT SIGNAL CIRCUIT

1. Turn ignition switch OFF.

- 2. Disconnect ECM harness connector.
- Check the continuity between VIAS control solenoid valve 1 harness connector and ECM harness connector.

VIAS control s	VIAS control solenoid valve 1		CM	Continuity
Connector	Terminal	Connector	Terminal	Continuity
F63	2	F14	108	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 VIAS CONTROL SOLENOID VALVE 1

Check VIAS control solenoid valve 1. Refer to EC-488, "Component Inspection".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace VIAS control solenoid valve 1. Refer to <u>EC-15, "ENGINE CONTROL SYSTEM : Component Parts Location"</u>.

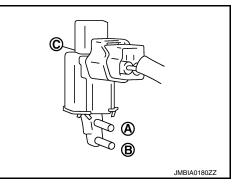
Component Inspection

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 \textcircled{A} and \textcircled{B}	Air passage continuity between \textcircled{A} and \textcircled{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.

INFOID:000000011939965

P1800 VIAS CONTROL SOLENOID VALVE 1

< DTC/CIRCUIT DIAGNOSIS >

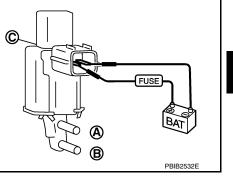
4. Check air passage continuity and operation delay time under the following conditions.

Condition	Air passage continuity between (A) and (B)	Air passage continuity between \textcircled{A} and \textcircled{C}
12 V direct current supply between 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 1. Refer to <u>EC-15, "ENGINE CONTROL SYSTEM : Component Parts Location"</u>.



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P1801 VIAS CONTROL SOLENOID VALVE 2

< DTC/CIRCUIT DIAGNOSIS >

P1801 VIAS CONTROL SOLENOID VALVE 2

DTC Description

INFOID:000000011939966

IVQ35DE1

DTC DETECTION LOGIC

An excessively low or high voltage signal is sent to ECM through the VIAS control solenoid valve 2.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
	1801 VIAS S/V CIRC-B2 (VIAS solenoid valve circuit bank 2)	Diagnosis condition	Start engine and let it idle
		Signal (terminal)	VIAS control solenoid valve 2 signal
P1801		Threshold	An excessively low or high voltage signal is sent to ECM
	Diagnosis delay time	-	

POSSIBLE CAUSE

- · Harness or connectors
- (The solenoid valve 2 circuit is open or shorted.)
- VIAS control solenoid valve 2

FAIL-SAFE

Not applicable

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 5 seconds.
- 2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to EC-490, "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:0000000011939967

1. CHECK VIAS CONTROL SOLENOID VALVE 2 POWER SUPPLY

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

+			
VIAS control solenoid valve 2		_	Voltage
Connector	Terminal		
F65	1	Ground	Battery voltage

Is the inspection result normal?

P1801 VIAS CONTROL SOLENOID VALVE 2

< DTC/CIRCUIT DIAGNOSIS >

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INFOID:000000011939968

YES >> GO TO 2.

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

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

1. Turn ignition switch OFF.

2. Disconnect ECM harness connector.

 Check the continuity between VIAS control solenoid valve 2 harness connector and ECM harness connector.

VIAS control s	olenoid valve 2	E	CM	Continuity
Connector	Terminal	Connector	Terminal	Continuity
F65	2	F14	102	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 VIAS CONTROL SOLENOID VALVE 2

Check VIAS control solenoid valve 2. Refer to EC-491, "Component Inspection".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace VIAS control solenoid valve 2. Refer to <u>EC-15, "ENGINE CONTROL SYSTEM : Component Parts Location"</u>.

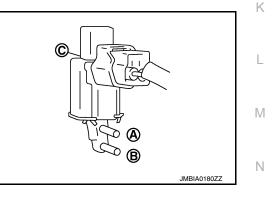
Component Inspection

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 \textcircled{B} and \textcircled{B}	Air passage continuity between \textcircled{A} and \textcircled{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.

P1801 VIAS CONTROL SOLENOID VALVE 2

< DTC/CIRCUIT DIAGNOSIS >

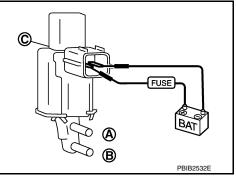
4. Check air passage continuity and operation delay time under the following conditions.

Condition	Air passage continuity between \textcircled{A} and \textcircled{B}	Air passage continuity between \textcircled{A} and \textcircled{C}
12 V direct current supply between 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>EC-15, "ENGINE CONTROL SYSTEM : Compo-</u> nent Parts Location".



[VQ35DE]

< DTC/CIRCUIT DIAGNOSIS >

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 Description

DTC DETECTION LOGIC

A brake switch signal is not sent to ECM for extremely long time while the vehicle is driving.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
		Diagnosis condition	—	E
		Signal (terminal)	Stop lamp switch signal	
P1805	BRAKE SW/CIRCUIT (Stop lamp switch circuit)	Threshold	A brake switch signal is not sent to ECM while the vehicle is driving	F
		Diagnosis delay time	Extremely long time	

POSSIBLE CAUSE

- Harness or connectors
- (Stop lamp switch circuit is open or shorted.)
- Stop lamp switch

FAIL-SAFE

	Engine operating condition	in fail-safe mode	
Fail safe mode	Vehicle behavior		
	ECM controls the electric throttle control actuator b Therefore, acceleration will be poor.	y regulating the throttle opening to a small ra	ange.
Brake switch	Vehicle condition	Driving condition	
	When engine is idling	Normal	
	When accelerating	Poor acceleration	
DTC CONFIRM	ATION PROCEDURE		
1.PERFORM D	TC CONFIRMATION PROCEDURE		
 Erase the D Check 1st tri Is 1st trip DTC de YES >> Go to NO-1 >> To cl 	s the brake pedal for at least 5 seconds. FC with CONSULT. p DTC.	Refer to <u>GI-41, "Intermittent Incident</u> "	<u>.</u>
Diagnosis Pro	ocedure		INFOID:000000011939971
1.CHECK STOP	P LAMP SWITCH CIRCUIT		
1. Turn ignition	switch OFF.	na hraka nadal	

2. Check the stop lamp when depressing and releasing the brake pedal.

Brake pedal	Stop lamp
Fully released	Not illuminated
Slightly depressed	Illuminated

INFOID:000000011939969

INFOID:000000011939970

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< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal? YES >> INSPECTION END

NO >> GO TO 2.

2. CHECK STOP LAMP RELAY POWER SUPPLY CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect stop lamp relay harness connector.
- 3. Check the voltage between stop lamp relay harness connector and ground.

	-		
Stop lan	np relay	_	Voltage
Connector	Terminal		
E34	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> Perform the trouble diagnosis for power supply circuit.

3.CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT-I

- 1. Reconnect stop lamp relay harness connector.
- 2. Disconnect stop lamp switch harness connector.
- 3. Check the voltage between stop lamp switch harness connector and ground.

+			
Stop lam	p switch	_	Voltage
Connector	Terminal		
E38	2	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4.CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT-II

- 1. Disconnect stop lamp relay harness connector.
- Check the continuity between stop lamp switch harness connector and stop lamp relay harness connector.

+		-		
Stop lam	Stop lamp switch		Stop lamp relay	
Connector	Terminal	Connector	Connector Terminal	
E38	2	E34	2	Existed

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

5.CHECK STOP LAMP SWITCH GROUND CIRCUIT

Check the continuity between stop lamp switch harness connector and ground.

	÷			
Stop lam	p switch	_	Continuity	
Connector	Terminal			
E38	1	Ground	Existed	

Is the inspection result normal?



			P180	5 BRAKE S	SWIICH	
< DTC/CIRC		NOSIS >			[VQ35	DE]
	GO TO 6.					
^		-	nosis for J	power supply of	sircuit.	A
6.CHECK S	TOP LAMF	SWITCH				
Check the sto	op lamp sw	itch. Refer to	כ <u>EC-495.</u>	"Component I	nspection (Stop Lamp Switch)".	EC
Is the inspect		ormal?				
	GO TO 7.	n lamn awit	ab Dafart			
_	•			o <u>BR-20, "Exp</u>		С
				OWER SUPPL		
Check the vo	Itage betwe	een stop lan	ip relay ha	irness connec	or and ground.	D
	+					L
Stop	lamp relay		_	Voltage		
Connector	Termi	inal		voltago		E
E34	3		round	Battery voltage		
Is the inspect	_		ound	Dattory Voltage		F
· · · · ·	30 TO 8.					1
		trouble diag	nosis for p	power supply o	sircuit.	
8.CHECK S	TOP LAMF	SWITCH S	IGNAL CI	RCUIT		G
1. Disconne	ect ECM ha	rness conne	ector.			
				elay harness c	onnector and ECM harness connector.	F
					_	
+			-			
Stop lam	ip relay	E	СМ	Continuity		
Connector	Terminal	Connector	Termina	I	_	
E34	5	E10	139	Existed	_	J
		for short to	ground an	d to power.		
Is the inspect		ormal?				
	GO TO 9. Repair or re	place error-	detected n	arte		k
9.CHECK S	•		Jeleoleu p			
			<u> </u>			
		-	<u>EC-496, "(</u>	<u>component in</u>	spection (Stop Lamp Relay)".	L
Is the inspect YES >> II	<u>ION RESULT N</u>					
		p lamp relay	1.			Ν
Componer	•			Switch)		
			, Lamp		INFOID:00000001	
1.CHECK S	TOP LAMF	SWITCH-I				Ν
1. Turn ignit	tion switch	OFF.				
2. Disconne	ect stop lan	np switch ha				C
3. Check th	e continuity	/ Detween si	op lamp s	witch terminal	s under the following conditions.	
Terminals		Conditior		Cont	nuity	
		Fully re		Not e		F
1 and 2	Brake peda		IEdSEU	NOL E		

Is the inspection result normal?

Brake pedal

Slightly depressed

YES >> INSPECTION END NO >> GO TO 2.

1 and 2

Existed

< DTC/CIRCUIT DIAGNOSIS >

2.CHECK STOP LAMP SWITCH-II

- 1. Adjust stop lamp switch installation. Refer to BR-12, "Adjustment".
- 2. Check the continuity between stop lamp switch terminals under the following conditions.

Terminals		Continuity	
1 and 2 B	Brake pedal	Fully released	Not existed
	Drake pedal	Slightly depressed	Existed

Is the inspection result normal?

YES >> INSPECTION END

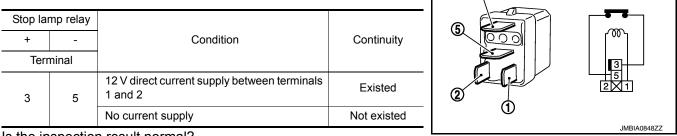
NO >> Replace stop lamp switch. Refer to <u>BR-20, "Exploded View"</u>.

Component Inspection (Stop Lamp Relay)

INFOID:000000012461056

1.CHECK STOP LAMP RELAY

- 1. Turn ignition switch OFF.
- 2. Remove stop lamp relay.
- 3. Check the continuity between stop lamp relay terminals as per the following conditions.



Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace stop lamp relay.

< DTC/CIRCUIT DIAGNOSIS >

P2096, P2097, P2098, P2099 A/F SENSOR 1

DTC Description

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DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition
		Diagnosis condition	—
	POST CAT FUEL TRIM SYS B1	Signal (terminal)	_
P2096 (Post c	(Post catalyst fuel trim system too lean bank 1)	Threshold	The output voltage computed by ECM from the A/F sensor 1 signal is shifts to the lean side for a specified period
		Diagnosis delay time	_
		Diagnosis condition	_
	POST CAT FUEL TRIM SYS B1	Signal (terminal)	_
	(Post catalyst fuel trim system too rich	Threshold	The A/F signal computed by ECM from the A/ F sensor 1 signal is shifts to the rich side for a specified period
		Diagnosis delay time	_
		Diagnosis condition	_
	POST CAT FUEL TRIM SYS B2	Signal (terminal)	_
	(Post catalyst fuel trim system too lean	Threshold	The output voltage computed by ECM from the A/F sensor 1 signal is shifts to the lean side for a specified period
		Diagnosis delay time	_
		Diagnosis condition	_
	POST CAT FUEL TRIM SYS B2	Signal (terminal)	-
P2099 (F	(Post catalyst fuel trim system too rich bank 2)	Threshold	The A/F signal computed by ECM from the A/ F sensor 1 signal is shifts to the rich side for a specified period
		Diagnosis delay time	—

POSSIBLE CAUSE

DTC P2096

- A/F sensor 1 (bank 1)
- A/F sensor 1 heater
- Heated oxygen sensor 2 (bank 1)Fuel pressure
- Fuel pressure
 Fuel injector
- Intake air leaks
- Exhaust gas leaks

DTC P2097

- A/F sensor 1 (bank 1)
- A/F sensor 1 heater
- Heated oxygen sensor 2 (bank 1)
- Fuel pressure
- Fuel injector
- Intake air leaks
- Exhaust gas leaks

DTC P2098

- A/F sensor 1 (bank 2)
- A/F sensor 1 heater
- Heated oxygen sensor 2 (bank 2)

- Fuel pressure
- Fuel injector
- Intake air leaks
- Exhaust gas leaks

DTC P2099

- A/F sensor 1 (bank 2)
- A/F sensor 1 heater
- Heated oxygen sensor 2 (bank 2)
- Fuel pressure
- Fuel injector
- Intake air leaks
- Exhaust gas leaks

FAIL-SAFE Not applicable

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-162, "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-498, "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:0000000011939974

1.RETIGHTEN A/F SENSOR 1 AND HEATED OXYGEN SENSOR 2

Loosen and retighten the A/F sensor 1 and heated oxygen sensor 2. Refer to <u>EM-32</u>, <u>"Removal and Installa-tion (bank 2)"</u>, <u>EM-34</u>, <u>"Removal and Installation (bank 1)"</u>.

>> GO TO 2.

2. CHECK FOR EXHAUST GAS LEAK

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

		P209	96, P2	097, P2	098, P20	99 A/F SI	ENSOR 1		
< DTC/CIR		AGNOSIS	>					[VQ35DE]	
		l run it at ic		ar tha mas	s air flow se	nsor			Δ
Is intake air			aye and		3 an now 30				А
YES >>	GO TO	4.							
	•	or replace r		• •					EC
4.CLEAR									
1. Clear th 2. Run en		e ratio self at least 10				62, "Descrip	<u>ption"</u> .		С
	-			•		? Is it difficu	lt to start en	gine?	
		<u>ion"</u> or <u>EC</u>				174 or P01	172, P0175.	Refer to EC-289, "DTC	D
5. CHECK		-	CTOR						Е
	nition swi								
		sensor 1 h connector f							
J. CHECK	namess		or wate	1.					F
		d not exit.							
Is the inspe YES >>	Ction res		<u>-</u>						G
-		o. or replace h	arness	connector					
6.снеск	AIR FUE	L RATIO (A	4∕F) SE	NSOR 1 P	OWER SUP	PPLY			Н
		sensor 1 h	arness	connector.					
	nition swi the voltad		n A/F se	nsor 1 har	ness conne	ctor and gro	ound.		
		+							J
DTC		A/F sensor		-	Volta	age			
P2096	Bank	Connector	Termin	al					
P2097	1	F12	1	Groun	d Battery	voltago			K
P2098 P2099	2	F61	1	Gloun	u Ballery	Vollage			
Is the inspe	ction res	ult normal?)						L
YES >>	GOTO	8.	-						
_	GOTO								M
7.CHECK			A/F) SE	NSOR 1 P	OWER SUP		UII		
	nition swi nect IPDI	ICN OFF. M E/R harr	iess cor	nnector.					Ν
3. Check	the contir	nuity betwe	en A/F	sensor 1 h	arness con	nector and I	IPDM E/R h	arness connector.	
		۸/E c	ensor 1		וחסו	M E/R			0
DTC	Ba		inector	Terminal	Connector	Terminal	Continuity		
P2096			=12	1		52			Р
P2097 P2098		2 1	-61	1	F50	53	Existed		
P2099			01	I		55			

Is the inspection result normal?

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

NO >> Repair or replace error-detected parts.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

8.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
P2096	1	F12	3		66	
P2097	I	F12	4	F14	67	Existed
P2098	2	F61	3	1 14	76	
P2099	2	101	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 (Terminal	Ground	Continuity
P2096	1	F12	3		
P2097	I	1 12	4	Not existed	
P2098	2 +61		3		Ground
P2099			4		

DTC -	EC	CM	Ground	Continuity	
	Connector	Terminal	Ground		
P2096		66		Not existed	
P2097	P2097 F14 P2098	67	Ground		
P2098		76			
P2099		77			

5. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 9.

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

9.CHECK A/F SENSOR 1 HEATER

Check A/F sensor 1 heater. Refer to EC-209, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 10.

NO >> GO TO 12.

10.CHECK HEATED OXYGEN SENSOR 2

Check heated oxygen sensor 2. Refer to EC-212, "Component Inspection".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace malfunctioning heated oxygen sensor 2.

11.REPLACE AIR FUEL RATIO (A/F) SENSOR 1

Replace malfunctioning air fuel ratio (A/F) sensor 1. Refer to <u>EM-32, "Removal and Installation (bank 2)", EM-34, "Removal and Installation (bank 1)"</u>.

Do you have CONSULT?

YES >> GO TO 12. NO >> GO TO 13.

< DTC/CIRCUIT DIAGNOSIS >	[VQ35DE]
12.confirm a/f adjustment data	<u> </u>
 With CONSULT Turn ignition switch ON. 	A
 Select "A/F ADJ-B1" and "A/F ADJ-B2" in "DATA MONITOR" mode with CONSULT. Make sure that "0.000" is displayed on CONSULT screen. 	EC
<u>Is "0.000" displayed?</u> YES >> INSPECTION END NO >> GO TO 13.	C
13.CLEAR THE MIXTURE RATIO SELF-LEARNING VALUE	D
Clear the mixture ratio self-learning value. Refer to <u>EC-162, "Description"</u> . <u>Do you have CONSULT?</u>	
YES >> GO TO 15. NO >> INSPECTION END	E
14.CONFIRM A/F ADJUSTMENT DATA	
 With CONSULT 1. Turn ignition switch ON. 	F
 Select "A/F ADJ-B1" and "A/F ADJ-B2" in "DATA MONITOR" mode with CONSULT. Make sure that "0.000" is displayed on CONSULT screen. 	G
>> INSPECTION END	
	Н
	I
	J
	K
	L
	N

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P2100, P2103 THROTTLE CONTROL MOTOR RELAY

< DTC/CIRCUIT DIAGNOSIS >

P2100, P2103 THROTTLE CONTROL MOTOR RELAY

DTC Description

INFOID:000000011939975

[VQ35DE]

DTC DETECTION LOGIC

• ECM detects that the voltage of power source for throttle control motor is excessively low.

• ECM detects that the throttle control motor relay is stuck ON.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
		Diagnosis condition	Start engine and let it idle
	ETC MOT PWR-B1	Signal (terminal)	Throttle control motor circuit
P2100 (Throttle actuator "A" control motor cir- cuit/open)	Threshold	ECM detects that the voltage of power source for throttle control motor is excessively low	
		Diagnosis delay time	-
ETC MOT PWR-B1 (Throttle actuator "A" control motor cir- cuit high)		Diagnosis condition	Ignition switch ON
	Signal (terminal)	Throttle control motor circuit	
		Threshold	ECM detects that the throttle control motor re- lay is stuck ON
		Diagnosis delay time	-

POSSIBLE CAUSE

DTC P2100

- Harness or connectors
- (Throttle control motor relay circuit is open)
- Throttle control motor relay

DTC P2103

- Harness or connectors
- (Throttle control motor relay circuit is shorted)
- Throttle control motor relay

FAIL-SAFE

Engine operating condition in fail-safe mode		
Fail safe mode Vehicle behavior		
Throttle control motor relay	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.	

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.

Witch DTC is detected?

P2100 >> GO TO 2.

P2103 >> GO TO 3.

2.PERFORM DTC CONFIRMATION PROCEDURE FOR DTC P2100

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

- 2. Start engine and let it idle for 5 seconds.
- 3. Check DTC.



D2400 D2402 TUDOTTI E CONTROL MOTOR DEL AV

	P2100	, P2103 TI	HROTTLE	CONTROL MOTOR RELAY		
< DTC/CIRC	UIT DIAGNC	SIS >			[VQ35DE]	
Is DTC detect						
	Proceed to <u>EC</u> NSPECTION	<u>-503, "Diagno</u> FND	osis Procedur	<u>e"</u> .		А
•			ROCEDURE	FOR DTC P2103		
		and wait at I				EC
2. Check D	TC.					J
Is DTC detect YES >> P			aia Dracadur	o"		С
NO-1 >> T	o check malfu		om before rep	pair: Refer to GI-41, "Intermittent Incident"		
NO-2 >> C	confirmation a	fter repair: IN	SPECTION E	ND		D
Diagnosis	Procedure				INFOID:000000011939976	
1. CHECK TH	HROTTLE CO	ONTROL MOT	FOR RELAY F	POWER SUPPLY CIRCUIT		Е
	ion switch OF					
		ess connector harness conn				_
				connector and ECM harness connector.		F
	/IE/R		CM	Continuity		G
Connector F50	Terminal 57	Connector F13	Terminal 2	Existed		
	-	r short to grou				Н
Is the inspect		-				
	O TO 2.	ward a la a with a				
~			-	ort to power in harness or connectors. NPUT SIGNAL CIRCUIT		
-				connector and ECM harness connector.		J
T. Oncor in	c continuity b		E/IX namess			0
IPDN	/IE/R	EC	CM	Continuity		17
Connector	Terminal	Connector	Terminal			Κ
F51	65	F13	8	Existed		
2. Also cheo Is the inspect		r short to grou	ind and short	to power.		L
		buble diagnos	is for power s	supply circuit.		
				ort to power in harness or connectors.		M
						Ν
						0
						0

P2101 ELECTRIC THROTTLE CONTROL FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

P2101 ELECTRIC THROTTLE CONTROL FUNCTION

DTC Description

INFOID:000000011939977

[VQ35DE]

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
	ETC FNCTN/CIRC-B1	Diagnosis condition	Start engine and let it idle
		Signal (terminal)	—
P2101 (Throttle actuator "A" control motor cir- cuit range/performance)	Threshold	Electric throttle control function does not op- erate properly	
		Diagnosis delay time	—

POSSIBLE CAUSE

- Harness or connectors
- (Throttle control motor circuit is open or shorted)
- Electric throttle control actuator

FAIL-SAFE

Engine operating condition in fail-safe mode		
Fail safe mode Vehicle behavior		
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.	

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P2101 is displayed with DTC P2100 or P2119, first perform the confirmation procedure for DTC P2100 or P2119.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable.
 - DTC P2100: Refer to <u>EC-502</u>, "DTC Description".
 - DTC P2119: Refer to <u>EC-509</u>, "DTC Description".

NO >> GO TO 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:

Before performing the following procedure, confirm that battery voltage is more than 11 V when engine is running.

>> GO TO 3.

3. 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 <u>EC-505</u>, "Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-41, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

P2101 ELECTRIC THROTTLE CONTROL FUNCTION

Diagnosi	e Droce					
0	511000	dure				INFOID:000000011939978
.снеск	DTC PRI	ORITY				
DTC P21 or P2119.	01 is disp	layed w	ith DTC P2	100 or P2119, first	perform the confirmation	procedure for DTC P2100
<u>s applicabl</u> YES >>			osis of appl	icable		
120 22	• DTC P	2100: F	Refer to <u>EC-</u>	502, "DTC Descrip 509, "DTC Descrip		
-	GO TO 2 THROTT			TOR RELAY INPU	T SIGNAL	
. Check	the voltag	ge betwo	een ECM ha	arness connector te	erminals.	
	EC	CM				
+			_	Condition	Voltage	
Connector	Terminal	Conditi	on Terminal			
F13	8	E10	152	Ignition switch OFF	Approx. 0 V Battery voltage	
the inspe	oction res	ult norm	al?	Ignition switch ON	Dattery voltage	
	• GO TO 5 • GO TO 3					
NO >>	GO TO 3	3.	NTROL MO	TOR RELAY POW	ER SUPPLY CIRCUIT	
NO >> CHECK	GO TO C THROTT	3. LE CON			ER SUPPLY CIRCUIT	
NO >> CHECK . Turn ig . Discon	GO TO THROTT nition swi nect ECN	3. LE CON tch OFF 1 harnes	- ss connecto	r.	ER SUPPLY CIRCUIT	
NO >> CHECK . Turn ig . Discon . Discon	GO TO C THROTT nition swi nect ECM nect IPDM	3. LE CON tch OFF 1 harnes M E/R h	s connecto arness conr	r. nector.	ER SUPPLY CIRCUIT	connector.
NO >> CHECK Discon Discon Check	GO TO C THROTT nition swi nect ECM nect IPDM the contir	3. LE CON tch OFF 1 harnes M E/R h	ss connecto arness conr ween IPDM	r. nector. I E/R harness conr		connector.
NO >> CHECK Discon Discon Check	GO TO C THROTT nition swi nect ECN nect IPDN the contir	3. LE COI tch OFF 1 harnes M E/R h nuity bet	: ss connecto arness conr tween IPDM E	r. nector. I E/R harness conr CM		connector.
NO >> CHECK Discon Discon Check	GO TO C THROTT nition swi nect ECM nect IPDM the contir	3. ILE CON tch OFF 1 harnes M E/R h nuity bet	ss connecto arness conr ween IPDM E Connector	r. nector. I E/R harness conr CM Terminal	ector and ECM harness o	connector.
NO >> CHECK . Turn ig . Discon . Discon . Check IP Connector F50	GO TO CONTROLLER CONTROLLE CONTROLLE CONTROLLER CONTROLLE CONTROLLER CONTROLL	3. ILE CON tch OFF 1 harnes M E/R h nuity bet ninal	E ss connecto arness conr tween IPDM E Connector F13	r. nector. I E/R harness conr CM Terminal 2	ector and ECM harness o	connector.
NO >> .CHECK . Turn ig . Discon . Discon . Check IP Connector F50 . Also ch	GO TO CONTROLLER CONTR	3. ILE CON tch OFF 1 harnes M E/R h nuity bet ninal 7 ess for s	ss connecto arness conr tween IPDM E Connector F13 short to grou	r. nector. I E/R harness conr CM Terminal	ector and ECM harness o	connector.
NO >> CHECK Turn ig Discon Discon Check IP Connector F50 Also ch the inspe YES >>	GO TO C THROTT nition swi nect ECM nect IPDM the contir	3. TLE CON tch OFF 1 harnes M E/R h nuity be ninal 7 ess for s ult norm 4.	E ss connector arness conr tween IPDM E Connector F13 short to grou al?	r. hector. I E/R harness conr CM Terminal 2 und and short to po	Continuity Existed	
NO >> CHECK Discon Discon Check IP Connector F50 Also ch the inspe YES >> NO >>	GO TO C THROTT nition swi nect ECM nect IPDM the contin	3. LE CON tch OFF 1 harnes M E/R h nuity ben ninal 7 ess for s <u>ult norm</u> 4. pen circ	E connecto arness conr tween IPDM Connector F13 short to grou al? cuit, short to	r. hector. I E/R harness conr CM Terminal 2 und and short to po 9 ground or short to	Continuity Existed wwer.	
NO >> CHECK Discon Discon Check IP Connector F50 Also ch the inspe YES >> NO >>	GO TO C THROTT nition swi nect ECM nect IPDM the contin	3. LE CON tch OFF 1 harnes M E/R h nuity ben ninal 7 ess for s <u>ult norm</u> 4. pen circ	E connecto arness conr tween IPDM Connector F13 short to grou al? cuit, short to	r. hector. I E/R harness conr CM Terminal 2 und and short to po 9 ground or short to	Continuity Existed	
NO >> CHECK Turn ig Discon Discon Check IP Connector F50 Also ch the inspe YES >> NO >> CHECK	GO TO C THROTT nition swi nect ECM nect IPDM the contir DM E/R DM E/R C COM E/R C COM E/R C COM E/R C COM E/R C COM E/R C COM E/R C C COM E/R C C C C C C C C C C C C C C C C C C C	3. LE CON tch OFF 1 harnes M E/R h nuity bet inal 7 ess for s <u>ult norm</u> 4. pen circ LE CON	E connecto arness conr tween IPDM Connector F13 short to grou al? cuit, short to	r. nector. I E/R harness conr CM Terminal 2 und and short to po 9 ground or short to TOR RELAY INPU	Continuity Existed wwer.	nectors.
NO >> CHECK Turn ig Discon Discon Check IP Connector F50 Also check YES >> NO >> CHECK Check	GO TO C THROTT nition swii nect ECM nect IPDM the contir DM E/R DM E/R DM E/R C DM E/R C C DM E/R C C DM E/R C C C DM E/R C C C C C C C C C C C C C C C C C C C	3. LE CON tch OFF 1 harnes M E/R h nuity bet inal 7 ess for s <u>ult norm</u> 4. pen circ LE CON	E connecto arness conr tween IPDM Connector F13 short to grou al? cuit, short to NTROL MO tween IPDM	r. nector. I E/R harness conr CM Terminal 2 und and short to po 9 ground or short to TOR RELAY INPU I E/R harness conr	Continuity Existed wer. Dower in harness or cont T SIGNAL CIRCUIT	nectors.
NO >> CHECK Discon Discon Check IP Connector F50 Also ch the inspe YES >> NO >> CHECK Check	GO TO CONTRIBUTION SWI INITION	3. LE CON tch OFF 1 harnes M E/R h nuity ben inal 7 ess for s <u>ult norm</u> 4. pen circo LE CON nuity ben	E connecto arness conr tween IPDM Connector F13 short to grou al? cuit, short to NTROL MO tween IPDM	r. hector. I E/R harness conr CM 2 und and short to po o ground or short to TOR RELAY INPU I E/R harness conr CM CM CM CM CM CM CM CO CO CO CO CO CO CO CO CO CO	Continuity Existed wer. Dower in harness or cont T SIGNAL CIRCUIT	nectors.
NO >> CHECK Turn ig Discon Discon Discon Check IP Connector F50 Also ch the inspe YES >> NO >> CHECK Check IP Connector IP Connector IP Connector IP Connector IP Connector IP Connector	GO TO C THROTT nition swii nect ECM nect IPDM the contir 2DM E/R GO TO 4 Repair o THROTT the contir 2DM E/R COM E/R	3. LE COI tch OFF 1 harnes M E/R h nuity bel ninal 7 ess for s ult norm 4. pen circ LE COI nuity bel	E connecto arness conr tween IPDM Connector F13 short to grou al? cuit, short to NTROL MO tween IPDM tween IPDM E Connector	r. nector. I E/R harness conr CM 2 und and short to po o ground or short to TOR RELAY INPU I E/R harness conr CM CM CM CM CM CM CM CM CM CM	Continuity Existed wwer. Dower in harness or control SIGNAL CIRCUIT Dector and ECM harness of Continuity	nectors.
NO >> CHECK Turn ig Discon Discon Check IP Connector F50 Also ch the inspe YES >> NO >> CHECK Check IP Connector F51	GO TO Control of Contr	3. LE CON tch OFF 1 harnes M E/R h nuity bel ninal 7 ess for s <u>ult norm</u> 4. pen circ LE CON nuity bel ninal 5	E SS CONNECTO arness CONN tween IPDM Connector F13 Short to grou al? Cuit, short to NTROL MO tween IPDM Connector F13	r. hector. I E/R harness conr CM 2 und and short to po o ground or short to TOR RELAY INPU I E/R harness conr CM CM Terminal 8	ector and ECM harness of Continuity Existed ower. power in harness or cont T SIGNAL CIRCUIT tector and ECM harness of Continuity Existed	nectors.
NO >> .CHECK . Turn ig . Discon . Discon . Discon . Check . Check . Also ch . CHECK . Check . Check . Check	GO TO Control of Contr	3. iLE CON tch OFF 1 harnes M E/R h nuity bel ninal 7 ess for s ult norm 4. pen circ iLE CON nuity bel ninal 5 ess for s	E SS CONNECTO arness Conr tween IPDM E Connector F13 Short to grou al? Cuit, short to NTROL MO tween IPDM E Connector F13 Short to grou	r. nector. I E/R harness conr CM 2 und and short to po o ground or short to TOR RELAY INPU I E/R harness conr CM CM CM CM CM CM CM CM CM CM	ector and ECM harness of Continuity Existed ower. power in harness or cont T SIGNAL CIRCUIT tector and ECM harness of Continuity Existed	nectors.
NO >> .CHECK . Turn ig . Discon . Discon . Discon . Check IP Connector F50 . Also ch . CHECK . Check IP . CHECK . Check IP . Check	GO TO Control of Contr	3. LE CON tch OFF 1 harnes M E/R h nuity bel ninal 7 ess for s ult norm 4. pen circ LE CON nuity bel ninal 5 ess for s ult norm	E connector arness conr tween IPDM Connector F13 short to grou al? cuit, short to NTROL MO tween IPDM Connector F13 short to grou al? connector F13	r. hector. I E/R harness conr CM 2 und and short to po o ground or short to po o ground or short to po TOR RELAY INPU I E/R harness conr CM CM CM I E/R harness conr CM und and short to po a guidant short to po	ector and ECM harness of Continuity Existed ower. power in harness or cont T SIGNAL CIRCUIT tector and ECM harness of Continuity Existed ower.	nectors.
NO >> .CHECK . Turn ig . Discon . Discon . Discon . Check . Check . Also ch . Also ch . CHECK . Chec	GO TO Control of Contr	3. LE COI tch OFF 1 harnes M E/R h nuity bei annal 7 ess for s <u>ult norm</u> 4. pen circo LE COI nuity bei annal 5 ess for s <u>ult norm</u> the trou	E connector arness conr tween IPDM Connector F13 short to grou al? cuit, short to NTROL MO tween IPDM Connector F13 short to grou al? connector F13 short to grou al?	r. nector. I E/R harness conr CM 2 Und and short to po o ground or short to po o ground or short to po TOR RELAY INPU I E/R harness conr CM CM CM CM CM CM CM CM CM CM	ector and ECM harness of Continuity Existed ower. power in harness or cont T SIGNAL CIRCUIT tector and ECM harness of Continuity Existed ower.	nectors. connector.

3. Disconnect ECM harness connector.

P2101 ELECTRIC THROTTLE CONTROL FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

 Check the continuity between electric throttle control actuator harness connector and ECM harness connector.

Electric throttle	control actuator	ECM		Continuity
Connector	Terminal	Connector	Terminal	Continuity
	1	F13	1	Not existed
E 57	2		3	Existed
F57			1	Existed
			3	Not existed

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

Is the inspection result normal?

YES >> GO TO 6.

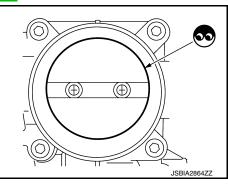
NO >> Repair or replace malfunctioning part.

 $\mathbf{6}$.CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

- 1. Remove the intake air duct. Refer to EM-26, "Removal and Installation".
- 2. Check if foreign matter is caught between the throttle valve and the housing.

Is the inspection result normal?

- YES >> GO TO 7.
- NO >> Remove the foreign matter and clean the electric throttle control actuator inside, refer to <u>EM-27</u>, "<u>Removal and Installation</u>", and then perform Throttle Valve Closed Position Learning. Refer to <u>EC-159</u>, "<u>Description</u>".



7. CHECK THROTTLE CONTROL MOTOR

Check throttle control motor. Refer to EC-506, "Component Inspection".

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Replace electric throttle control actuator. Refer to <u>EM-27, "Removal and Installation"</u>.

Component Inspection

INFOID:0000000011939979

[VQ35DE]

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?

YES >> INSPECTION END

NO >> Replace electric throttle control actuator. Refer to EM-27, "Removal and Installation".

P2118 THROTTLE CONTROL MOTOR

< DTC/CIRCUIT DIAGNOSIS >

P2118 THROTTLE CONTROL MOTOR

DTC Description

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition
		Diagnosis condition	Start engine and let it idle
	ETC MOT-B1	Signal (terminal)	Throttle control motor circuit
P2118	(Throttle actuator control motor current range/performance)	Threshold	ECM detects short in both circuits between ECM and throttle control motor
		Diagnosis delay time	-

POSSIBLE CAUSE

- Harness or connectors
 (Throttle control motor circuit is shorted.)
- Electric throttle control actuator (Throttle control motor)

FAIL-SAFE

Fail safe mode	Vehicle behavior
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.
DTC CONFIRMATION PRC	OCEDURE
1.PRECONDITIONING	
ing the next test.	e has been previously conducted, always perform the following before conduct- and wait at least 10 seconds.
	and wait at least 10 seconds.
>> GO TO 2. 2. PERFORM DTC CONFIRM	IATION PROCEDURE
 Turn ignition switch ON ar Start engine and let it idle Check DTC. Is DTC detected? 	nd wait at least 2 seconds. for 5 seconds.
YES >> Proceed to EC-50 NO-1 >> To check malfunct	7, "Diagnosis Procedure". tion symptom before repair: Refer to <u>GI-41, "Intermittent Incident"</u> . repair: INSPECTION END
Diagnosis Procedure	INFOID:00000001193998:
Diagnosis Procedure	

3. Check the continuity between electric throttle control actuator harness connector and ECM harness connector.

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INFOID:000000011939980

P2118 THROTTLE CONTROL MOTOR

< DTC/CIRCUIT DIAGNOSIS >

Electric throttle control actuator		ECI	N	Continuity
Connector	Terminal	Connector	Terminal	Continuity
F57	1	F13	1	Not existed
	2		3	Existed
			1	Existed
	2		3	Not 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-508, "Component Inspection".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace electric throttle control actuator. Refer to EM-27, "Removal and Installation".

Component Inspection

INFOID:0000000011939982

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?

YES >> INSPECTION END

NO >> Replace electric throttle control actuator. Refer to EM-27, "Removal and Installation".

P2119 ELECTRIC THROTTLE CONTROL ACTUATOR

< DTC/CIRCUIT DIAGNOSIS >

P2119 ELECTRIC THROTTLE CONTROL ACTUATOR

DTC Description

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)		D	TC detection condition
			Diagnosis condition	—
			Signal (terminal)	
		1	Threshold	Electric throttle control actuator does not function properly due to the return spring mal- function
			Diagnosis delay time	_
			Diagnosis condition	_
P2119	ETC ACTR-B1 (Throttle actuator control throttle		Signal (terminal)	_
F2119	body range/performance)	2	Threshold	Throttle valve opening angle in fail-safe mode is not in specified range
			Diagnosis delay time	_
			Diagnosis condition	_
			Signal (terminal)	_
		3	Threshold	ECM detects that the throttle valve is stuck open
			Diagnosis delay time	_

POSSIBLE CAUSE

Electric throttle control actuator

FAIL-SAFE

	Engine operating condition in fail-safe mode	
Fail safe mode	Vehicle behavior	K
	(When electric throttle control actuator does not function properly due to the return spring mal- function:) ECM controls the electric throttle actuator by regulating the throttle opening around the idle posi- tion. The engine speed will not rise more than 2,000 rpm.	L
Electric throttle control actuator	(When throttle valve opening angle in fail-safe mode is not in specified range:) ECM controls the electric throttle control actuator by regulating the throttle opening to 20 degrees or less.	M
	 (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 or more. 	Ν

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.

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P2119 ELECTRIC THROTTLE CONTROL ACTUATOR

< DTC/CIRCUIT DIAGNOSIS >

 $\overline{2}$. PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION 1 AND 2

- 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-510, "Diagnosis Procedure".

NO >> GO TO 3.

3. PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION 3

- 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-510, "Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-41, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

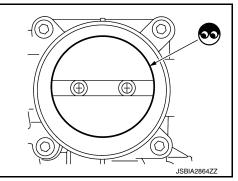
Diagnosis Procedure

1. CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

- 1. Turn ignition switch OFF.
- 2. Remove the intake air duct. Refer to EM-26, "Removal and Installation".
- 3. Check if foreign matter is caught between the throttle valve and the housing.

Is the inspection result normal?

- YES >> GO TO 2.
- NO >> Remove the foreign matter and clean the electric throttle control actuator inside, and then perform Throttle Valve Closed Position Learning. Refer to <u>EC-159</u>, "<u>Description</u>".



2.REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

- 1. Replace electric throttle control actuator. Refer to EM-27, "Removal and Installation".
- 2. Perform Idle Air Volume Learning. Refer to EC-160, "Description".

>> INSPECTION END

Revision: October 2015

[VQ35DE]

INFOID:000000011939984

DTC Description

DTC DETECTION LOGIC

• An excessively low voltage from the APP sensor 1 is sent to ECM.

• An excessively high voltage from the APP sensor 1 is sent to ECM.

DTC	CONSULT screen terms (Trouble diagnosis content)	C	DTC detection condition	
		Diagnosis condition	Start engine and let it idle	
P2122	APP SEN 1/CIRC (Throttle/Pedal position sensor/switch	Signal (terminal)	Voltage signal transmitted from APP sensor 1 to ECM	
	"D" circuit low) Thresho	Threshold	An excessively low voltage is sent to ECM	
		Diagnosis delay time	-	
		Diagnosis condition	Start engine and let it idle	
P2123	APP SEN 1/CIRC (Throttle/Pedal position sensor/switch	Signal (terminal)	Voltage signal transmitted from APP sensor 1 to ECM	
	"D" circuit high)	Threshold	An excessively high voltage is sent to ECM	
		Diagnosis delay time	—	

POSSIBLE CAUSE

DTC P2122

- Harness or connectors
- (APP sensor 1 circuit is open or shorted.)
- Accelerator pedal position sensor (APP sensor 1)

DTC P2123

- Harness or connectors
- (APP sensor 1 circuit is open or shorted.)
- Accelerator pedal position sensor
- (APP sensor 1)

FAIL-SAFE

Engine operating condition in fail-safe mode			
Fail safe mode	Vehicle behavior		
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 CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P2122 or P2123 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to <u>EC-424</u>, "<u>DTC Description</u>".

NO >> GO TO 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.

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< DTC/CIRCUIT DIAGNOSIS >

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10 V at idle.

>> GO TO 3.

3. PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and let it idle for 1 second.

2. Check DTC.

Is DTC detected?

YES >> Proceed to EC-512, "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:0000000011939986

1.CHECK DTC PRIORITY

If DTC P2122 or P2123 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to EC-424, "DTC Description".

NO >> GO TO 2.

2.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.

	+		Mallaca		
APP	sensor	_	Voltage (Approx.)		
Connector	Terminal		(II)		
E40 4		Ground	5 V		

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.CHECK APP SENSOR 1 POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF

2. Disconnect ECM harness connector.

3. Check the voltage between APP sensor harness connector and ECM harness connector.

APP	APP sensor		ECM		
Connector	Terminal	Connector	Terminal	Continuity	
E40	4	E10	146	Existed	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

4.CHECK APP SENSOR 1 GROUND 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	CM	Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
E40	2	E10	151	Existed	

Revision: October 2015

5.CHECK APP S 1. Check the co APP senso	result norma O 5. hir open circu SENSOR 1 I ontinuity betw or ferminal C 3	<u>I?</u> uit, short to NPUT SIG	ground or s NAL CIRCU sensor harne	hort to power in harr		stor.
YES >> GO T NO >> Repa D.CHECK APP S 1. Check the co APP senso Connector T E40 2. Also check ha	O 5. nir open circu SENSOR 1 I Intinuity betw or ierminal C 3	uit, short to NPUT SIG veen APP EC Connector	NAL CIRCU sensor harne	IIT ess connector and E		stor.
NO >> Reparation of the contract of the contra	ir open circu SENSOR 1 I Intinuity betwork or ierminal C 3	NPUT SIG veen APP EC Connector	NAL CIRCU sensor harne	IIT ess connector and E		tor.
CHECK APP S Check the co APP senso Connector T E40 Also check ha	SENSOR 1 I Intinuity betwork or erminal C 3	NPUT SIG veen APP EC Connector	NAL CIRCU sensor harne	IIT ess connector and E		tor.
Check the co APP senso Connector T E40 . Also check ha	ontinuity betwo or Germinal C 3	veen APP EC Connector	sensor harne	ess connector and E	CM harness connec	stor.
APP senso Connector T E40 . Also check ha	or Ferminal C 3	EC Connector	M		CM harness connec	tor.
Connector T E40 . Also check ha	erminal C	Connector		Continuity		
Connector T E40 Also check ha	erminal C	Connector		Continuity		
E40 Also check ha	3		Terminal	COMPANY		
Also check ha	-	F10				
	<u> </u>	210	150	Existed		
the inspection r	arness for sr	nort to grou	und and shor	rt to power.		
-		<u>l?</u>				
YES >> GO T						
•	•	lit, snort to	ground or s	hort to power in harr	ness or connectors.	
.CHECK APP S						
heck APP sense			component Ir	nspection".		
the inspection I						
	ECTION EN		accombly Dr	efer to <u>ACC-3, "Rem</u>	oval and Installation	
•			assembly. Re	elel to <u>ACC-3, Relli</u>		-
omponent Ir	nspection					INFOID:000000011939987
.CHECK ACCE			SITION SEN	NSOR		
 Reconnect al . Turn ignition 			isconnecteu	l.		
		en ECM ha	arness conne	ector terminals unde	r the following condi	tions.
				1		
	ECM					
Connector	+		-	Cor	ndition	Voltage (V)
		Terminal				
	150		151		Fully released	0.5 - 1.0
	100		101	Fully depressed		4.2 - 4.8
F10				Accelerator nedal	Fully depressed	4.2 - 4.8
E10	143		144	 Accelerator pedal 	Fully depressed Fully released	4.2 - 4.8 0.25 - 0.50

DTC Description

[VQ35DE]

DTC DETECTION LOGIC

• An excessively low voltage from the APP sensor 2 is sent to ECM.

· An excessively high voltage from the APP sensor 2 is sent to ECM.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
		Diagnosis condition	Start engine and let it idle	
P2127	APP SEN 2/CIRC (Throttle/Pedal position sensor/switch	Signal (terminal)	Voltage signal transmitted from APP sensor 2 to ECM	
	"E" circuit low)	Threshold An excessively low voltage is se	An excessively low voltage is sent to ECM	
		Diagnosis delay time	—	
		Diagnosis condition	Start engine and let it idle	
P2128	APP SEN 2/CIRC (Throttle/Pedal position sensor/switch	Signal (terminal)	Voltage signal transmitted from APP sensor 2 to ECM	
	"E" circuit high)	Threshold	An excessively high voltage is sent to ECM	
		Diagnosis delay time	-	

POSSIBLE CAUSE

DTC P2127

- Harness or connectors

 (APP sensor 2 circuit is open or shorted.)
 [CMP sensor (PHASE) circuit is open or shorted.]
 (Battery current sensor circuit is shorted.)
 (EOP sensor circuit is shorted.)
 (Refrigerant pressure sensor is shorted.)
- Accelerator pedal position sensor (APP sensor 2)
- Camshaft position sensor (PHASE)
- Battery current sensor
- Engine oil pressure sensor
- Refrigerant pressure sensor

DTC P2128

- Harness or connectors (APP sensor 2 circuit is open or shorted.) [CMP sensor (PHASE) circuit is open or shorted.] (Battery current sensor circuit is shorted.) (EOP sensor circuit is shorted.) (Refrigerant pressure sensor is shorted.)
- Accelerator pedal position sensor (APP sensor 2)
- Camshaft position sensor (PHASE)
- Battery current sensor
- Engine oil pressure sensor
- Refrigerant pressure sensor

FAIL-SAFE

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

Fail safe mode	(When electric throt	Vehicle behavior ottle control actuator does not function properly due to the return spring mal		
		electric throttle actuator by regulating the throttle opening around the idle po peed will not rise more than 2,000 rpm.		
Electric throttle control actuator		(When throttle valve opening angle in fail-safe mode is not in specified range:) ECM controls the electric throttle control actuator by regulating the throttle opening to 20 degree or less.		
	While the vehicle is stops, the engine st	ts the throttle valve is stuck open:) s being driven, it slows down gradually because of fuel cut. After the vehicle stalls. start in the N or P position, and engine speed will not exceed 1,000 rpm or		
TC CONFIRMATION PR	OCEDURE			
PRECONDITIONING				
	ure has been previo	iously conducted, always perform the following before condu		
ng the next test.				
 Turn ignition switch OFF Turn ignition switch ON. 	and wait at least 1	IU SECONDS.		
Turn ignition switch OFF	and wait at least 1	10 seconds.		
ESTING CONDITION: Before performing the follo	owing procedure.	, confirm that battery voltage is more than 8 V at idle.		
	.			
>> GO TO 2.				
2.PERFORM DTC CONFIF	RMATION PROCED	DURE		
. Start engine and let it idl	e for 1 second.			
2. Check DTC. s DTC detected?				
YES >> Proceed to EC-{	515. "Diagnosis Pro	ocedure".		
NO-1 >> To check malfun	ction symptom before	fore repair: Refer to <u>GI-41, "Intermittent Incident"</u> .		
NO-2 >> Confirmation aft	er repair: INSPECT	TION END		
Diagnosis Procedure		INFOID:0000000119		
CHECK APP SENSOR 2	POWER SUPPLY	1		
2. Turn ignition switch ON.		P) sensor harness connector. arness connector and ground.		
+				
APP sensor	_	Voltage (V)		
Connector Terminal				
E40 5	Ground	Approx. 5		
s the inspection result norm YES >> GO TO 3. NO >> GO TO 2.	<u>al?</u>			
CHECK APP SENSOR 2	POWER SUPPLY	(CIRCUIT		

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

< DTC/CIRCUIT DIAGNOSIS >

APP	P sensor ECM			Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
E40	5	E10	142	Existed	

Is the inspection result normal?

YES >> Check sensor power supply 2 circuit. Refer to EC-569, "Diagnosis Procedure".

NO >> Repair or replace error-detected parts.

3.CHECK APP SENSOR 2 GROUND 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	APP sensor		ECM		
Connector	Terminal	Connector	Terminal	Continuity	
E40	1	E10	144	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 APP SENSOR 2 INPUT SIGNAL CIRCUIT

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

APP :	sensor	ECM		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E40	6	E10	143	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 APP SENSOR

Check APP sensor. Refer to EC-516. "Component Inspection".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace accelerator pedal assembly. Refer to ACC-3, "Removal and Installation".

Component Inspection

INFOID:000000011939990

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					
Connector	+	_	Condition		Voltage (V)	
Connector	Terr	ninal				
	150 151		Fully released	0.5 - 1.0		
E10	150	151	Accelerator pedal	Fully depressed	4.2 - 4.8	
EIU	140	144	Accelerator pedar	Fully released	0.25 - 0.50	
	143	144		Fully depressed	2.0 - 2.5	

< DTC	/CIRCUIT DIAGNOSIS >	[VQ35DE]
-	inspection result normal?	
YES NO		A
		EC
		C
		D
		E
		F
		G
		Н
		I
		J
		K
		L
		M
		Ν
		0
		P

< DTC/CIRCUIT DIAGNOSIS >

P2135 TP SENSOR

DTC Description

INFOID:0000000011939991

[VQ35DE]

DTC DETECTION LOGIC

Rationally incorrect voltage is sent to ECM compared with the signals from TP sensor 1 and TP sensor 2.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
		Diagnosis condition	Start engine and let it idle	
	TP SENSOR-B1	Signal (terminal)	TP sensor 1 signal and TP sensor 2 signal	
P2135	(Throttle/Pedal position sensor/switch "A" / "B" voltage correlation)	Threshold	Rationally incorrect voltage is sent to ECM compared with the signals from TP sensor 1 and TP sensor 2	
	-	Diagnosis delay time	—	

POSSIBLE CAUSE

- Harness or connector (TP sensor 1 or 2 circuit is open or shorted.)
- Electric throttle control actuator (TP sensor 1 or 2)

FAIL-SAFE

Engine operating condition in fail-safe mode			
Fail safe mode Vehicle behavior			
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.		

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P2135 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to <u>EC-424, "DTC Description"</u>.

NO >> GO TO 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:

Before performing the following procedure, confirm that battery voltage is more than 8 V at idle.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and let it idle for 1 second.

2. Check DTC.

Is DTC detected?

YES >> Proceed to EC-519, "Diagnosis Procedure".

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

EC-518

P2135 TP SENSOR

IVQ35DE < DTC/CIRCUIT DIAGNOSIS > **Diagnosis** Procedure INFOID:000000011939992 А 1. CHECK DTC PRIORITY If DTC P2135 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. EC Is applicable DTC detected? YES >> Perform diagnosis of applicable. Refer to EC-424, "DTC Description". NO >> GO TO 2. 2.check throttle position sensor power supply 1. Disconnect electric throttle control actuator harness connector. 2. Turn ignition switch ON. D 3. Check the voltage between electric throttle control actuator harness connector and ground. + Ε Electric throttle control actuator Voltage (Approx.) Connector Terminal F57 5 5 V Ground Is the inspection result normal? YES >> GO TO 4. NO >> GO TO 3. ${\it 3.}$ CHECK THROTTLE POSITION SENSOR POWER SUPPLY CIRCUIT Н 1. Turn ignition switch OFF. 2. Disconnect ECM harness connector. Check the continuity between electric throttle control actuator harness connector and ECM harness con-3. nector. Electric throttle control actuator ECM Continuity Connector Terminal Connector Terminal F57 F14 5 98 Existed Is the inspection result normal? Κ YES >> INSPECTION END NO >> Repair or replace error-detected parts. ${f 4}$. CHECK THROTTLE POSITION SENSOR GROUND CIRCUIT L 1. Turn ignition switch OFF. Disconnect ECM harness connector. 2. Check the continuity between electric throttle control actuator harness connector and ECM harness con-3. M nector. ECM Electric throttle control actuator Ν Continuity Connector Terminal Connector Terminal F57 F14 4 75 Existed Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5.

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

 ${f 5}.$ CHECK THROTTLE POSITION SENSOR INPUT SIGNAL CIRCUIT

 Check the continuity between electric throttle control actuator harness connector and ECM harness connector. Ρ

P2135 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

Electric throttle control actuator		ECM		Continuity	
Connector Terminal		Connector	Terminal	Continuity	
F57	3	F14	72	Existed	
F57	6	1 14	71	LAISIEU	

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 THROTTLE POSITION SENSOR

Check throttle position sensor. Refer to EC-520, "Component Inspection".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace electric throttle control actuator. Refer to ACC-3, "Removal and Installation".

Component Inspection

INFOID:000000011939993

1. CHECK THROTTLE POSITION SENSOR

1. Turn ignition switch OFF.

- 2. Reconnect all harness connectors disconnected.
- 3. Perform Throttle Valve Closed Position Learning. Refer to <u>EC-159, "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.

ECM						
Connector	+	-	Condition		Voltage	
Connector	Terr	Terminal				
	F11	- 75	Accelerator pedal	Fully released	More than 0.36 V	
F14				Fully depressed	Less than 4.75 V	
	72			Fully released	Less than 4.75 V	
				Fully depressed	More than 0.36 V	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace electric throttle control actuator. Refer to <u>ACC-3, "Removal and Installation"</u>.

P2138 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P2138 APP SENSOR

DTC Description

INFOID:0000000011939994

[VQ35DE]

DTC DETECTION LOGIC

Rationally incorrect voltage is sent to ECM compared with the signals from APP sensor 1 and APP sensor 2.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
		Diagnosis condition	Start engine and let it idle
APP SENSOR (Throttle/Pedal position sensor/ "D" / "E" voltage correlation)		Signal (terminal)	APP sensor 1 signal and APP sensor 2 signal
	(Throttle/Pedal position sensor/switch	Threshold	Rationally incorrect voltage is sent to ECM compared with the signals from APP sensor 1 and APP sensor 2
		Diagnosis delay time	—

POSSIBLE CAUSE Harness or connector (APP sensor 1 or 2 circuit is open or shorted.) [CMP sensor (PHASE) circuit is open or shorted.] (Battery current sensor circuit is shorted.) (EOP sensor circuit is shorted.)

(Refrigerant pressure sensor is shorted.)

- Accelerator pedal position sensor
- (APP sensor 1 or 2)
- Camshaft position sensor (PHASE)
- Battery current sensor
- Engine oil pressure sensor
- Refrigerant pressure sensor

FAIL-SAFE

	Engine operating condition in fail-safe mode	
Fail safe mode	Vehicle behavior	K
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.	L

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P2135 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to <u>EC-424, "DTC Descri</u>	<u>ption"</u> .
---	-----------------

NO	>> GO TO 2.
\frown	

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:

Before performing the following procedure, confirm that battery voltage is more than 8 V at idle.

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< DTC/CIRCUIT DIAGNOSIS >

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and let it idle for 1 second.

2. Check DTC.

Is DTC detected?

- YES >> Proceed to EC-522. "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:000000011939995

1.CHECK DTC PRIORITY

If DTC P2135 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to EC-424, "DTC Description".

NO >> GO TO 2.

2.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.

	+		N / 11	
APP :	sensor	_	Voltage (Approx.)	
Connector	Connector Terminal			
E40	4	Ground	5 V	

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.CHECK APP SENSOR 1 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	Continuity	
Connector Terminal		Connector	Terminal	Continuity
E40	4	E10	146	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

4.CHECK APP SENSOR 2 POWER SUPPLY

1. Turn ignition switch ON.

2. Check the voltage between APP sensor harness connector and ground.

	+		Valtaga	
APP sensor		_	Voltage (Approx.)	
Connector	Connector Terminal			
E40	5	Ground	5 V	

Is the inspection result normal?

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

P2138 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

APP sensor ECM Continuity E40 5 E10 142 Existed Is the inspection result normal? YES >> Check sensor power supply 2 circuit. Refer to EC-569, "Diagnosis Procedure". NO >> Repair or replace error-detected parts. 6CHECK APP SENSOR GROUND CIRCUIT 1. Turn ignition switch OFF. 1. Disconnect ECM harness connector. 3. Check the continuity between APP sensor harness connector and ECM harness connector. APP sensor ECM Connector Terminal Connector Terminal Connector nesult normal? Continuity E40 1 E10 151 Existed 4. Also check harness for short to ground and short to power. Is the inspection result normal? YES YES > GO TO 7. NO >> Repair open circuit, short to ground or short to power in harness connectors. 7.CHECK APP SENSOR INPUT SIGNAL CIRCUIT 1. Check the continuity between APP sensor harness connector and ECM harness connector. Connector ECM Connector Terminal Connector Connector	1. Turn igni 2. Disconne	tion switch O ect ECM harr	ess connecto	or.		or and ECM harness connector.
Connector Terminal Continuity E40 5 E10 142 Existed Is the inspection result normal? YES >> Check sensor power supply 2 circuit. Refer to EC-569, "Diagnosis Procedure". NO NO >> Repair or replace error-detected parts. 6. CHECK APP SENSOR GROUND CIRCUIT 1 1. Turn ignition switch OFF. 2 Disconnect ECM harness connector. 3. Check the continuity between APP sensor harness connector and ECM harness connector. 2 Connector Terminal Continuity Connector Terminal Continuity Connector Terminal Continuity Connector Terminal Continuity Connector Terminal Connector Ket on the continuity between APP sensor harness connector and ECM harness connectors. 7. YES > GO TO 7. NO >> Repair open circuit, short to ground or short to power in harness connector. 7. CHECK APP SENSOR INPUT SIGNAL CIRCUIT 1. Check the continuity between APP sensor harness connector and ECM harness connector. 2. Also check harness for short to ground and short to power. Is the inspection result normal? YES > GO TO 8. <th></th> <th>-</th> <th></th> <th></th> <th></th> <th></th>		-				
Is the inspection result normal? YES >> Check sensor power supply 2 circuit. Refer to EC-569, "Diagnosis Procedure". NO >> Repair or replace error-detected parts. 6.CHECK APP SENSOR GROUND CIRCUIT 1 1. Turn ignition switch OFF. Disconnect ECM harness connector. 3. Check the continuity between APP sensor harness connector and ECM harness connector. APP sensor ECM Connector Terminal Connector Terminal Connector ECM Connector Terminal Connector Terminal Connector Terminal Connector EcM Connector Terminal Connector Terminal Connector EcM Connector Repair open circuit, short to ground or short to power in harness or connectors. 7.CHECK APP SENSOR INPUT SIGNAL CIRCUIT 1 1. Check the continuity between APP sensor harness connector and ECM harness connector. Connector Terminal Connector Terminal Continuity ECM Connector Terminal Connector Terminal <th></th> <th></th> <th></th> <th></th> <th>Continuity</th> <th></th>					Continuity	
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Disconnect ECM harness connector. Check the continuity between APP sensor harness connector and ECM harness connector. APP sensor ECM Connector Terminal E40 1 2 E10 151 Existed Also check harness for short to ground and short to power. athe inspection result normal? YES > GO TO 7. NO >> Repair open circuit, short to ground or short to power in harness or connectors. CHECK APP SENSOR INPUT SIGNAL CIRCUIT Connector Terminal Conn	NO >> F	Repair or repl	ace error-dete	ected parts.	efer to <u>EC-56</u>	9, "Diagnosis Procedure".
Connector Terminal Connector Terminal Continuity E40 1 E10 144 Existed Also check harness for short to ground and short to power. Image: Strength	. Disconne	ect ECM harn	ess connecto		ess connecto	or and ECM harness connector.
Connector Terminal Connector Terminal Terminal E40 1 E10 144 Existed Also check harness for short to ground and short to power. a the inspection result normal? YES > GO TO 7. NO >> Repair open circuit, short to ground or short to power in harness or connectors. · CHECK APP SENSOR INPUT SIGNAL CIRCUIT · Check the continuity between APP sensor harness connector and ECM harness connector. APP sensor ECM Connector Terminal	APP s	sensor	EC	CM	Continuity	-
E40 2 E10 151 Existed Also check harness for short to ground and short to power. athe inspection result normal? YES >> GO TO 7. NO >> Repair open circuit, short to ground or short to power in harness or connectors. .CHECK APP SENSOR INPUT SIGNAL CIRCUIT . Check the continuity between APP sensor harness connector and ECM harness connector. $\overrightarrow{Connector}$ Terminal </td <td>Connector</td> <td>Terminal</td> <td>Connector</td> <td>Terminal</td> <td>Continuity</td> <td>_</td>	Connector	Terminal	Connector	Terminal	Continuity	_
Also check harness for short to ground and short to power. a the inspection result normal? YES >> GO TO 7. NO >> Repair open circuit, short to ground or short to power in harness or connectors. .CHECK APP SENSOR INPUT SIGNAL CIRCUIT . Check the continuity between APP sensor harness connector and ECM harness connector. APP sensor ECM Connector Terminal Connector Continuity </td <td>E40</td> <td></td> <td>E10</td> <td></td> <td>Existed</td> <td></td>	E40		E10		Existed	
at the inspection result normal? YES >> GO TO 7. NO >> Repair open circuit, short to ground or short to power in harness or connectors. .CHECK APP SENSOR INPUT SIGNAL CIRCUIT . Check the continuity between APP sensor harness connector and ECM harness connector. APP sensor ECM <u>Connector</u> Terminal Connector Terminal		2		151		
ConnectorTerminalConnectorTerminalE403E10150Existed6143Existed \cdot Also check harness for short to ground and short to power.the inspection result normal?YES>> GO TO 8.NO>> Repair open circuit, short to ground or short to power in harness or connectors. \cdot CHECK APP SENSORheck APP sensor. Refer to EC-523. "Component Inspection".the inspection result normal?YES>> INSPECTION ENDNO>> Replace accelerator pedal assembly. Refer to ACC-3. "Removal and Installation".component InspectionInspection SENSOR.CHECK ACCELERATOR PEDAL POSITION SENSOR						or and ECM harness connector.
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	APP s	sensor	EC	CM		
E40 6 E10 143 Existed . Also check harness for short to ground and short to power. . . . athe inspection result normal? YES >> GO TO 8. . NO >> Repair open circuit, short to ground or short to power in harness or connectors. . CHECK APP SENSOR . . . check APP sensor. Refer to EC-523. "Component Inspection". . . s the inspection result normal? . . YES >> INSPECTION END . NO >> Replace accelerator pedal assembly. Refer to ACC-3. "Removal and Installation". component Inspection . cHECK ACCELERATOR PEDAL POSITION SENSOR	Connector	Terminal	Connector	Terminal	 Continuity 	
s the inspection result normal? YES >> GO TO 8. NO >> Repair open circuit, short to ground or short to power in harness or connectors. CHECK APP SENSOR Check APP sensor. Refer to EC-523. "Component Inspection". s the inspection result normal? YES >> INSPECTION END NO >> Replace accelerator pedal assembly. Refer to ACC-3. "Removal and Installation". Component Inspection .CHECK ACCELERATOR PEDAL POSITION SENSOR	E40	-	E10		Existed	-
YES >> GO TO 8. NO >> Repair open circuit, short to ground or short to power in harness or connectors. CHECK APP SENSOR Check APP sensor. Refer to EC-523. "Component Inspection". Sthe inspection result normal? YES >> INSPECTION END NO >> Replace accelerator pedal assembly. Refer to ACC-3. "Removal and Installation". Component Inspection .CHECK ACCELERATOR PEDAL POSITION SENSOR			-	und and sho	ort to power.	
the inspection result normal? YES >> INSPECTION END NO >> Replace accelerator pedal assembly. Refer to <u>ACC-3. "Removal and Installation"</u> . COMPONENT Inspection CHECK ACCELERATOR PEDAL POSITION SENSOR	YES >> (NO >> F	GO TO 8. Repair open c	ircuit, short to	o ground or s	short to powe	r in harness or connectors.
.CHECK ACCELERATOR PEDAL POSITION SENSOR	<u>s the inspect</u> YES >> I	<u>tion result no</u>	rmal? END			3. "Removal and Installation".
	Componer	nt Inspecti	on			INFOID:000000011939996
	.CHECK A	CCELERATO	OR PEDAL PO	DSITION SE	NSOR	
. Reconnect all harness connectors disconnected.						

Turn ignition switch ON.
 Check the voltage between ECM harness connector terminals under the following conditions.

P2138 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

	ECM		Condition		Voltage (V)
Connector	+	-			
Connector	Terminal				
E10 -	143	144	Accelerator nodel	Fully released	0.25 - 0.50
				Fully depressed	2.0 - 2.5
	150 151	454	Accelerator pedal	Fully released	0.5 - 1.0
			Fully depressed	4.2 - 4.8	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace accelerator pedal assembly. Refer to <u>ACC-3</u>, "Removal and Installation".

< DTC/CIRCUIT DIAGNOSIS >

P219A, P219B AIR FUEL RATIO

DTC Description

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
		Diagnosis condition	_	
	AIR FUEL RATIO IMBALANCE B1 (Air-fuel ratio imbalance bank 1)	Signal (terminal)		
P219A		Threshold	ECM detects a lean/rich air fuel ratio state in any cylinder for a specified length of time	[
		Diagnosis delay time		
		Diagnosis condition	_	l
	AIR FUEL RATIO IMBALANCE B2	Signal (terminal)		
P210B	(Air-fuel ratio imbalance bank 2)	Threshold	ECM detects a lean/rich air fuel ratio state in any cylinder for a specified length of time	I
		Diagnosis delay time		

POSSIBLE CAUSE

DTC P219A • Fuel injector • Exhaust gas leaks • Incorrect fuel pressure	Η
 Mass air flow sensor Intake air leaks Lack of fuel 	I
 Incorrect PCV hose connection Improper spark plug Insufficient compression The fuel injector circuit is open or shorted 	J
 Ignition coil The ignition signal circuit is open or shorted	K
DTC P219B • Fuel injector • Exhaust gas leaks • Incorrect fuel pressure • Mass air flow sensor	L
 Intake air leaks Lack of fuel 	Μ
 Incorrect PCV hose connection Improper spark plug Insufficient compression The fuel injector circuit is open or shorted Ignition coil 	Ν
The ignition signal circuit is open or shorted FAIL-SAFE	0
	Ρ
DTC CONFIRMATION PROCEDURE 1.CHECK DTC PRIORITY	
If DTC P219A or P219B is displayed with other DTC, first perform the trouble diagnosis for the other DTC. Is applicable DTC detected?	

YES >> Perform diagnosis of applicable. Refer to <u>EC-107, "DTC Index"</u>.

NO >> GO TO 2.

EC-525

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< DTC/CIRCUIT DIAGNOSIS >

2. 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 3.

3.PRECONDITIONING-2

- 1. Turn ignition switch ON.
- 2. Clear the mixture ratio self-learning value. Refer to EC-162, "Description".

Will CONSULT be used?

YES >> GO TO 4.

NO >> GO TO 7.

4.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 65°C (149°F).

>> GO TO 5.

5.PERFORM DTC CONFIRMATION PROCEDURE-2

(B) 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.

ENG SPEED	1,000 – 1,800 rpm
COOLAN TEMP/S	More than 65°C (149°F)
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.
- 3. Check "SYSTEM 1 DIAGNOSIS A B1" indication.

Is "CMPLT" displayed?

YES >> GO TO 6.

NO >> GO TO 3.

O.PERFORM DTC CONFIRMATION PROCEDURE-3

Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to EC-527, "Diagnosis Procedure".

NO-1 >> To check malfunction symptom before repair: Refer to GI-41, "Intermittent Incident".

NO-2 >> Confirmation after repair: INSPECTION END

< DTC/CIRCUIT DIAGNOSIS > 7. PERFORM DTC CONFIRMATION PROCEDURE-4 А 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. EC CAUTION: Always drive vehicle at a safe speed. Engine speed 1,000 - 1,800 rpm Calculated load value 27 - 80 % Selector lever D position D NOTE: Drive the vehicle at approximately 88 km/h (55MPH) allows easy diagnosis. Keep the accelerator pedal as possible during crusing. Ε Check 1st trip DTC. Is 1st trip DTC detected? YES >> Proceed to EC-527, "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:0000000011939998 1. CHECK DTC PRIORITY Н If DTC P219A or P219B is displayed with other DTC, first perform the trouble diagnosis for the other DTC. Is applicable DTC detected? YES >> Perform diagnosis of applicable. Refer to EC-107, "DTC Index". NO >> GO TO 2. 2.CHECK FOR INTAKE AIR LEAK Stop engine and check the following for connection. 1. Air duct Vacuum hoses PCV hose Κ Intake air passage between air duct to intake manifold 2. Start engine and let it idle. Listen for an intake air leak after the mass air flow sensor. 3. Is the inspection result normal? YES >> GO TO 3. NO >> Repair or replace error-detected parts. Μ 3.CHECK EXHAUST GAS LEAK 1. Stop engine and visually check exhaust tube, three way catalyst and muffler for dents connection. 2. Start engine and let it idle. Ν 3. Listen for an exhaust gas leak before three way catalyst (manifold). Three way catalyst 1 Three way catalyst 2 Muffler A/F sensor 1 HO2S2 Ρ

: Exhaust gas Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

To exhaust manifold

PBIB1922E

[VQ35DE]

< DTC/CIRCUIT DIAGNOSIS >

4.CHECK FUEL PRESSURE

- 1. Release fuel pressure to zero. Refer to EC-168. "Work Procedure".
- 2. Check fuel pressure. Refer to <u>EC-168, "Work Procedure"</u>.

Is the inspection result normal?

YES >> GO TO 5. NO >> GO TO 10.

5. CHECK MASS AIR FLOW SENSOR

()With CONSULT

Check "MASS AIR FLOW" in "DATA MONITOR" mode of "ENGINE" using CONSULT.

For specification, refer to EC-587, "Mass Air Flow Sensor".

With GST

Check mass air flow sensor signal in Service \$01 using GST.

For specification, refer to EC-587, "Mass Air Flow Sensor".

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 grounds. Refer to <u>EC-222, "Diagnosis Procedure"</u>.

6.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.

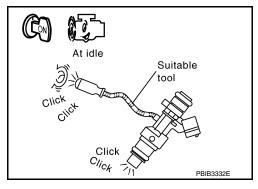
Without CONSULT

- 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 7.
- NO >> Perform trouble diagnosis for fuel injector, refer to <u>EC-</u> <u>551, "Component Inspection"</u>.



7. CHECK FUNCTION OF FUEL INJECTOR-2

CAUTION:

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-46, "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.

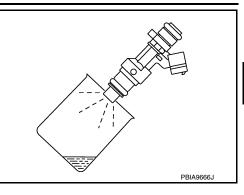
< DTC/CIRCUIT DIAGNOSIS >

7. Crank engine for approximately 3 seconds.

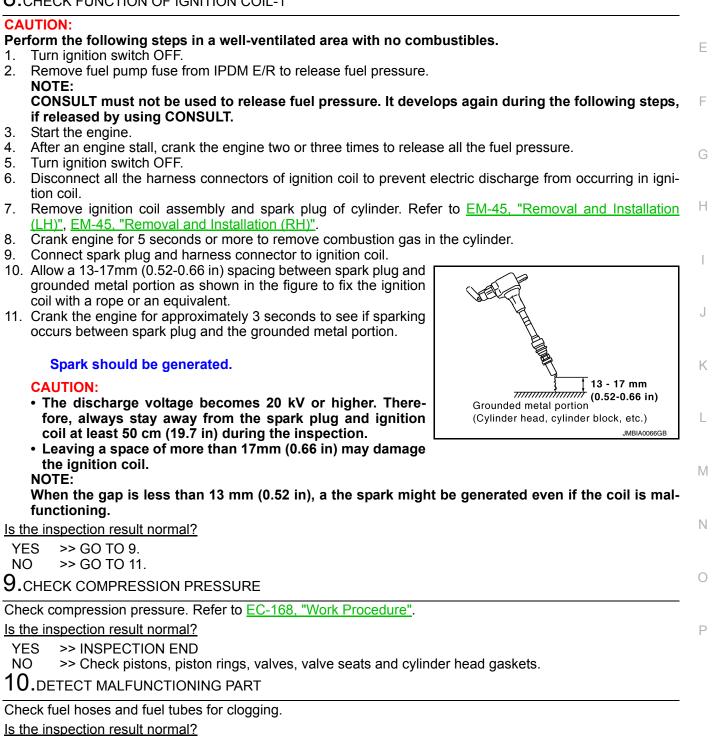
Fuel should be sprayed evenly for each fuel injector. Fuel must not drip from the tip of fuel injector.

Is the inspection result normal?

- YES >> GO TO 8.
- NO >> Replace fuel injector. Refer to <u>EM-46, "Removal and</u> <u>Installation"</u>.



8. CHECK FUNCTION OF IGNITION COIL-1



YES >> Replace fuel filter and fuel pump assembly. Refer to FL-5, "Removal and Installation".

EC-529

[VQ35DE]

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< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

NO >> Repair or replace error-detected parts.

11. 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?

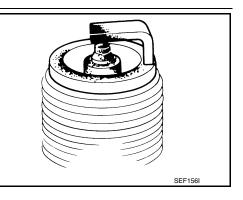
- YES >> GO TO 12.
- NO >> Check ignition coil, power transistor and their circuits. Refer to <u>EC-555. "Component Function</u> Check".

12.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-14</u>, <u>"Removal and Installation"</u>.
 - 2. GO TO 13.
- NO >> Replace spark plug(s) with standard type one(s). For spark plug type, refer to <u>EM-140, "Spark Plug"</u>.



13.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 >> INSPECTION END
- NO >> Replace spark plug(s) with standard type one(s). For spark plug type, refer to <u>EM-140, "Spark</u> <u>Plug"</u>.

< 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 Description

INFOID:000000011940000

INFOID:000000011939999

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
			Diagnosis condition	_
			Signal (terminal)	_
		1	Threshold	ECM internal engine off timer is malfunction- ing
	ECM/PCM INTERNAL ENG OFF		Diagnosis delay time	-
P2610	TIMER		Diagnosis condition	-
1 2010	(ECM/PCM internal engine off timer		Signal (terminal)	-
	performance)	2	Threshold	The time calculated by ECM based on a de- scent allowance of engine coolant tempera- tures during ignition switch OFF is extremely shorter than the time counted by the Engine internal OFF timer
			Diagnosis delay time	_
1.INSPEC	FIRMATION PROCEDURE			
	ary to erase permanent DTC? GO TO 4.			
	GO TO 4. GO TO 2.			
2.PRECO	NDITIONING			
 Turn igi Turn igi TESTING C Before per 	nition switch OFF and wait at le nition switch ON. nition switch OFF and wait at le CONDITION: forming the following proced F condition.	ast	10 seconds.	y voltage is 12 V or more under ignition
>>	GO TO 3.			
3.PERFOR	RM DTC CONFIRMATION PRO	CE	DURE-I	
4 T		-	100	

1. Turn ignition switch ON and wait at least 190 seconds.

2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to <u>EC-532. "Diagnosis Procedure"</u>.

NO-1 >> To check malfunction symptom before repair: Refer to GI-41, "Intermittent Incident".

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P2610 ECM INTERNAL TIMER

< DTC/CIRCUIT DIAGNOSIS >

NO-2 >> Confirmation after repair: INSPECTION END

4.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 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.

>> GO TO 5.

5.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-532, "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-532, "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:0000000011940001

1.CHECK ECM POWER SUPPLY AND GROUND CIRCUIT

Check ECM power supply and ground circuit. Refer to EC-190, "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-107, "DTC Index"</u>.

NO >> GO TO 3.

3. PERFORM DTC CONFIRMATION PROCEDURE

P2610 ECM INTERNAL TIMER

< DTC/CIRCUIT DIAGNOSIS >	[VQ35DE]	
 Erase DTC. Perform DTC Confirmation Procedure again. Refer to <u>EC-531, "DTC Description"</u>. Is the 1st trip DTC P2610 displayed again? 	A	7
YES >> Replace ECM. Refer to <u>EC-586. "Removal and Installation"</u> . NO >> INSPECTION END	E	С
	C	С
	E)
	E	_
	F	-
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< DTC/CIRCUIT DIAGNOSIS >

ASCD INDICATOR

Component Function Check

INFOID:000000011940002

INFOID:000000011940003

[VQ35DE]

1. CHECK ASCD INDICATOR FUNCTION

Check ASCD indicator under the following conditions.

ASCD INDICATOR	СО	SPECIFICATION	
CRUISE	Ignition switch: ON	MAIN switch: Pressed at the 1st time →at the 2nd time	$ON\toOFF$

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to EC-534, "Diagnosis Procedure".

Diagnosis Procedure

1.CHECK DTC

Check that DTC UXXXX is not displayed.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Perform trouble diagnosis for DTC UXXXX.

2. CHECK COMBINATION METER FUNCTION

Check combination meter function. Refer to <u>MWI-20, "CONSULT Function (METER/M&A)"</u>.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace malfunctioning part.

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-68, "Removal and Installation"</u>.

NO >> Repair or replace error-detected parts.

BATTERY CURRENT SENSOR

< DTC/CIRCUI	T DIAGNOSI	S >			[VQ35DE]
BATTERY	CURREN	T SENSOF	R		
Diagnosis Pi	rocedure				INFOID:000000011940004
1. CHECK BAT	TERY CURRE	ENT SENSOR F	POWER SUPF	LY	1
		t sensor harnes			
2. Turn ignition	n switch ON.				
3. Check the v	voltage betwee	en battery curre	nt sensor harn	ess connector and grou	ind.
+	-			-	
Battery curr	rent sensor	_	Voltage (V)		
Connector	Terminal	-	5 ()		
F5	1	Ground	Approx. 5	_	
s the inspectior	n result norma	?		-	
YES >> GO		_			
NO >> GO					
CHECK BAT	TERY CURRE	ENT SENSOR F	POWER SUPP	LY CIRCUIT	
	n switch OFF.				
	ECM harness		rant aanaar ba	rease connector and D	CM hornoon connector
. Check the o	continuity betw	een ballery cur	rent sensor na	mess connector and E	CM harness connector.
Battery curr	rent sensor	E	CM		
· · · · , · ·					
Connector	Terminal	Connector	Terminal	Continuity	
Connector F5	Terminal 1	Connector F14	Terminal 87	Existed	
F5	1	F14			
F5 s the inspectior	1 n result norma	F14	87	Existed	cedure".
F5 s the inspection YES >> Che	1 n result norma eck sensor pov	F14	87 cuit. Refer to <u>E</u>		<u>cedure"</u> .
F5 s the inspection YES >> Che NO >> Rep	1 n result norma eck sensor pov pair or replace	F14 <u>?</u> wer supply 2 cir	87 cuit. Refer to <u>E</u> parts.	Existed	cedure".
F5 s the inspection YES >> Che NO >> Rep CHECK BAT	1 n result norma eck sensor pov pair or replace	F14 Prer supply 2 cir error-detected	87 cuit. Refer to <u>E</u> parts.	Existed	<u>cedure"</u> .
F5 <u>s the inspection</u> YES >> Che NO >> Rep CHECK BAT . Turn ignition . Disconnect	1 eck sensor pov pair or replace TERY CURRE n switch OFF. ECM harness	F14 Prover supply 2 cir error-detected ENT SENSOR (connector.	87 cuit. Refer to <u>F</u> parts. GROUND CIR(Existed	
F5 <u>s the inspection</u> YES >> Che NO >> Rep CHECK BAT . Turn ignition . Disconnect	1 eck sensor pov pair or replace TERY CURRE n switch OFF. ECM harness	F14 Prover supply 2 cir error-detected ENT SENSOR (connector.	87 cuit. Refer to <u>F</u> parts. GROUND CIR(Existed	<u>cedure"</u> . CM harness connector.
F5 S the inspection YES >> Che NO >> Rep CHECK BAT . Turn ignition . Disconnect . Check the o	1 eck sensor por pair or replace TERY CURRE n switch OFF. ECM harness continuity betw	F14 ver supply 2 cir error-detected ENT SENSOR (connector. reen battery cur	87 cuit. Refer to <u>F</u> parts. GROUND CIR(rrent sensor ha	Existed	
F5 s the inspection YES >> Che NO >> Rep CHECK BAT . Turn ignition . Disconnect . Check the o Battery curr	1 eck sensor pow pair or replace TERY CURRE n switch OFF. ECM harness continuity betw	F14 Per supply 2 cir error-detected ENT SENSOR (connector. reen battery cur	87 cuit. Refer to <u>F</u> parts. GROUND CIRC rent sensor ha	Existed	
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F5 the inspection YES >> Che NO >> Rep CHECK BAT . Turn ignition . Disconnect . Check the of Battery curr Connector F5	1 eck sensor pow pair or replace TERY CURRE n switch OFF. ECM harness continuity betw ent sensor Terminal 3	F14 Prover supply 2 cir error-detected ENT SENSOR (connector. reen battery cur EC Connector F14	87 cuit. Refer to <u>F</u> parts. GROUND CIRC rrent sensor ha	Existed C-569, "Diagnosis Prod CUIT rness connector and Ed Continuity Existed	
F5 the inspection YES >> Che NO >> Rep CHECK BAT Disconnect Disconnect Check the of Battery curr Connector F5 Also check	1 <u>n result norma</u> eck sensor pov pair or replace TERY CURRE n switch OFF. ECM harness continuity betw ent sensor <u>Terminal</u> 3 harness for sh	F14 Prover supply 2 cirrerror-detected ENT SENSOR (Connector. Proven battery current Connector F14 Provention of the provention of t	87 cuit. Refer to <u>F</u> parts. GROUND CIRC rrent sensor ha	Existed C-569, "Diagnosis Prod CUIT rness connector and Ed Continuity Existed	
F5 the inspection YES >> Che NO >> Rep CHECK BAT . Turn ignition . Disconnect . Disconnect . Check the of Battery curr Connector F5 . Also check a the inspection	1 eck sensor pow pair or replace TERY CURRE n switch OFF. ECM harness continuity betw ent sensor Terminal 3 harness for sh n result norma	F14 Prover supply 2 cirrerror-detected ENT SENSOR (Connector. Proven battery current Connector F14 Provention of the provention of t	87 cuit. Refer to <u>F</u> parts. GROUND CIRC rrent sensor ha	Existed C-569, "Diagnosis Prod CUIT rness connector and Ed Continuity Existed	
F5 S the inspection YES >> Che NO >> Rep CHECK BAT . Turn ignition . Disconnect . Disconnect . Check the of Battery curr Connector F5 . Also check S the inspection YES >> GO	1 n result norma eck sensor pow- pair or replace TERY CURRE n switch OFF. ECM harness continuity betw ent sensor Terminal 3 harness for sh n result norma o TO 4.	F14 Prover supply 2 cirreror-detected ENT SENSOR (Connector. Preen battery currer ECC Connector F14 Prover to ground a Prover to ground a Prover to ground a	87 cuit. Refer to E parts. GROUND CIRC rrent sensor ha mod short to power	Existed C-569, "Diagnosis Prod CUIT rness connector and Ed Continuity Existed	CM harness connector.
F5 S the inspection YES >> Che NO >> Rep CHECK BAT . Turn ignition . Disconnect . Disconnect . Check the of Battery curr Connector F5 . Also check s the inspection YES >> GO NO >> Rep	1 n result normal eck sensor pow- bair or replace TERY CURRE n switch OFF. ECM harness continuity betw ent sensor Terminal 3 harness for sh n result normal 0 TO 4. pair open circu	F14 Prover supply 2 cirrerror-detected ENT SENSOR (Connector. reen battery current Connector F14 Port to ground a Provent to ground to ground a Provent to ground to ground to ground to groun	87 cuit. Refer to E parts. GROUND CIR(rrent sensor ha mod short to power nd short to power nd or short to power	Existed Existed EC-569. "Diagnosis Prod CUIT rness connector and Ed Continuity Existed ver. cower in harness or cor	CM harness connector.
F5 S the inspection YES >> Che NO >> Rep CHECK BAT . Turn ignition . Disconnect . Disconnect . Check the of Battery curr Connector F5 . Also check S the inspection YES >> GO NO >> Rep . CHECK BAT	1 n result normal eck sensor pow- bair or replace TERY CURRE n switch OFF. ECM harness continuity betw ent sensor Terminal 3 harness for sh n result normal 0 TO 4. bair open circul TERY CURRE	F14 Prover supply 2 cirrerror-detected ENT SENSOR (Connector. reen battery currer Connector F14 Port to ground a Provent to ground a Provent SENSOR I	87 cuit. Refer to E parts. GROUND CIRO rrent sensor ha mod short to power nd or short to power NPUT SIGNAL	Existed Existed EC-569. "Diagnosis Prod CUIT rness connector and Ed Continuity Existed ver. Dower in harness or cor CIRCUIT	CM harness connector.
F5 S the inspection YES >> Che NO >> Rep CHECK BAT . Turn ignition . Disconnect . Disconnect . Disconnect . Check the of Battery curr Connector F5 . Also check s the inspection YES >> GO NO >> Rep . CHECK BAT	1 n result normal eck sensor pow- bair or replace TERY CURRE n switch OFF. ECM harness continuity betw ent sensor Terminal 3 harness for sh n result normal 0 TO 4. bair open circul TERY CURRE	F14 Prover supply 2 cirrerror-detected ENT SENSOR (Connector. reen battery currer Connector F14 Port to ground a Provent to ground a Provent SENSOR I	87 cuit. Refer to E parts. GROUND CIRO rrent sensor ha mod short to power nd or short to power NPUT SIGNAL	Existed Existed EC-569. "Diagnosis Prod CUIT rness connector and Ed Continuity Existed ver. Dower in harness or cor CIRCUIT	CM harness connector.
F5 S the inspection YES >> Che NO >> Rep CHECK BAT . Turn ignition . Disconnect . Disconnect . Check the of Battery curr Connector F5 . Also check s the inspection YES >> GO NO >> Rep . CHECK BAT . Check the of	1 n result normal eck sensor pow- bair or replace TERY CURRE n switch OFF. ECM harness continuity betw ent sensor Terminal 3 harness for sh n result normal 0 TO 4. bair open circu TERY CURRE continuity betw	F14 Prover supply 2 cirrerror-detected ENT SENSOR (Connector. reen battery currer Connector F14 Prover to ground a Prover SENSOR I Preen battery currer Prover SENSOR I Preen battery currer	87 cuit. Refer to E parts. GROUND CIRC rrent sensor ha M Terminal 64 nd short to pow nd or short to pow NPUT SIGNAI	Existed C-569. "Diagnosis Prod CUIT rness connector and Ed Continuity Existed ver. cower in harness or cor CIRCUIT rness connector and Ed	CM harness connector.
F5s the inspectionYES>> CheNO>> RepJ.CHECK BATI. Turn ignition2. Disconnect3. Check the colspan="2">Battery currConnectorF5I. Also checks the inspectionYES>> GONO>> RepJ.CHECK BATI. Check the colspan="2">Battery currConnectorF5I. Also checks the inspectionYES>> GONO>> RepJ.CHECK BATI. Check the colspan="2">Battery curr	1 n result normal eck sensor pow- bair or replace TERY CURRE n switch OFF. ECM harness continuity betw ent sensor Terminal 3 harness for sh n result normal 0 TO 4. bair open circu TERY CURRE continuity betw ent sensor	F14 Prover supply 2 cirrerror-detected ENT SENSOR (Connector. Preen battery currer Connector F14 Prover to ground a Preen battery currer ENT SENSOR I Preen battery currer ECC Connector F14 Prover to ground a Prover to ground a Prov	87 cuit. Refer to E parts. GROUND CIRO rrent sensor ha CM Terminal 64 nd short to pow nd or short to pow NPUT SIGNAL rrent sensor ha	Existed Existed EC-569. "Diagnosis Prod CUIT rness connector and Ed Continuity Existed ver. Dower in harness or cor CIRCUIT	CM harness connector.
F5 s the inspection YES >> Che NO >> Rep CHECK BAT . Turn ignition Disconnect Disconnect . Disconnect Battery curr Connector F5 Also check s the inspection YES >> GO NO >> Rep . CHECK BAT . Check the o	1 n result normal eck sensor pow- bair or replace TERY CURRE n switch OFF. ECM harness continuity betw ent sensor Terminal 3 harness for sh n result normal 0 TO 4. bair open circu TERY CURRE continuity betw	F14 Prover supply 2 cirrerror-detected ENT SENSOR (Connector. reen battery currer Connector F14 Prover to ground a Prover SENSOR I Preen battery currer Prover SENSOR I Preen battery currer	87 cuit. Refer to E parts. GROUND CIRC rrent sensor ha M Terminal 64 nd short to pow nd or short to pow NPUT SIGNAI	Existed C-569. "Diagnosis Prod CUIT rness connector and Ed Continuity Existed ver. cower in harness or cor CIRCUIT rness connector and Ed	CM harness connector.

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.

BATTERY CURRENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

INFOID:000000011940005

5. CHECK BATTERY CURRENT SENSOR

Check battery current sensor. Refer to EC-536, "Component Inspection".

Is the inspection result normal?

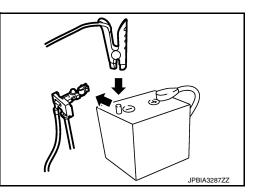
- YES >> Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u>.
- NO >> Replace battery negative cable assembly.

Component Inspection

1. CHECK BATTERY CURRENT SENSOR

- 1. Turn ignition switch OFF.
- 2. Reconnect harness connectors disconnected.
- 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	
F14	69	64	Approx. 2.5



Before measuring the terminal voltage, confirm that the battery is fully charged. Refer to PG-92, "How to Handle Battery".

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Replace battery negative cable assembly.

< DTC/CIRCL	JIT DIAGNO		RAKE PE	DAL POSITIC	N SWITCH	[VQ35DE]	
BRAKE P	EDAL P	OSIT	ION SWI	ТСН			
Component Function Check						INFOID:000000011940006	A
1. СНЕСК ВР	RAKE PEDA	L POSI	TION SWITC	CH FUNCTION			EC
	SULT					-	
2. Select "Bl		in "DA		R" mode with CON following condition			С
Monitor item		Conditio	on	Indication			D
BRAKE SW1	Brake peda	Slig	htly depressed	OFF			
DIVARE OWN	Diake peda	Full	y released	ON			Е
	ion switch O		ECM harness	connector termin	als.		F
	ECM					-	
Connector	+	_	С	condition	Voltage		G
	Terminal					_	
E10	140	152	Brake pedal	Slightly depressed Fully released	Approx. 0 V Battery voltage	_	Н
	ISPECTION roceed to <u>E(</u>	END C-537, '	'Diagnosis Pr	rocedure".		INFOID:000000011940007	I
4				CH POWER SUPF		197012.000000011940007	J
 Turn igniti Disconnee Turn igniti 	ion switch O ct brake ped ion switch O	FF. lal posit N.	ion switch ha	arness connector.		and ground.	K
+		_					
Brake pedal pe	Terminal		Voltaç	Je			M
E37	1	Grour	d Battery vo	oltage			
NO >> G	O TO 3. O TO 2.			CH POWER SUPF			N
 Turn igniti Disconne 	ion switch O ct fuse block e continuity b	FF. ((J/B) h	arness conn	ector.		r and fuse block (J/B) harness	C
Brake pedal r	osition switch		Fuse block (J	/B)			

Brake pedal position switch		Fuse bl	Continuity		
Connector	Terminal	Connector Terminal		Continuity	
E37	1	E6	1M	Existed	

Is the inspection result normal?

BRAKE PEDAL POSITION SWITCH

< DTC/CIRCUIT DIAGNOSIS >

- YES >> Perform the trouble diagnosis for power supply circuit.
- 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
E37	2	E10	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-538</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:000000011940008

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 BR-12, "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>.

< DTC/CIRCUIT DIAGNOSIS >

ICC BRAKE SWITCH

Component Function Check

1. CHECK BRAKE PEDAL POSITION SWITCH FUNCTION

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	Co	Indication	
BRAKE SW1 (ICC brake switch)	Brake pedal	Slightly depressed	OFF
	Diake pedal	Fully released	ON

Without CONSULT

1. Turn ignition switch ON.

2. Check the voltage between ECM harness connector terminals.

	ECM						
_	+	_	Condition Voltage				
Connector	Termir	nal					
E10	140	152	Brake pedal	Slightly depressed	Approx. 0 V		
LIU	140	152	Diake pedai	Fully released	Battery voltage	-	
s the inspe	ction result n	ormal?				-	
	INSPECTIC Proceed to		'Diagnosis F	Procedure".			
Diagnosi	s Procedu	re				INFOID:000000011940010	
1.снеск	BRAKE PED	AL POSI	TION SWIT	CH POWER SUPP	PLY CIRCUIT		
2. Discon 3. Turn ig	nition switch	edal posit ON.		arness connector. position switch har	ness connector a	nd ground.	
	+						
Brake neda	al position switch		Volta				
Connector	Terminal	-	Volte	ige in the second se			
E37	1	Groun	d Battery	voltage			
ls the inspe	ction result n	ormal?					
YES >>	GO TO 3. GO TO 2.						
2.снеск	BRAKE PED	AL POSI	TION SWIT	CH POWER SUPP	PLY CIRCUIT		
1. Turn ig 2. Discon	nition switch nect fuse blo	OFF. ck (J/B) h	arness conr	nector.		and fuse block (J/B) harness	

3. Check the continuity between brake pedal position switch harness connector and fuse block (J/B) harness P connector.

Brake pedal position switch		Fuse bl	Continuity		
Connector	Terminal	Connector	Terminal	Continuity	
E37	1	E6	1M	Existed	

Is the inspection result normal?

INFOID:000000011940009

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< DTC/CIRCUIT DIAGNOSIS >

- YES >> Perform the trouble diagnosis for power supply circuit.
- 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		ECM		Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
E37	2	E10	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 EC-540, "Component Inspection (ICC Brake Switch)".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace brake pedal position switch. Refer to <u>BR-20, "Exploded View"</u>.

Component Inspection (ICC Brake Switch)

INFOID:0000000011940011

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 peual	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-12, "Adjustment"</u>.

2. Check the continuity between brake pedal position switch terminals under the following conditions.

Terminals	(Continuity	
1 and 2	Brake pedal	Fully released	Existed
	biake peuai	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>.

< DTC/CIRCUIT DIAGNOSIS >

					А
Component Function	n Check			INFOID:000000011940012	
1. CHECK COOLING FAI	N FUNCTIO	ON			EC
 With CONSULT 1. Turn ignition switch O 2. Perform "COOLING F 3. Touch "LOW", "MID", 4. Check that cooling fail 	AN" in "AC "HI" on the	CONSULT scree		INE" using CONSULT.	С
® Without CONSULT	auto active	test and check o	cooling fan	motors operation, refer to PCS-9. "Diagnosis	D
Is the inspection result no YES >> INSPECTION NO >> Proceed to E	<u>rmal?</u> I END		· <u>e"</u> .		E
Diagnosis Procedure	Э			INFOID:000000011940013	
1. CHECK COOLING FAI	N RELAY F	OWER SUPPLY	CIRCUIT		G
 Turn ignition switch O Disconnect cooling fa Turn ignition switch O Check the voltage be 	n relays-2, N.		-3 harness	connectors and ground.	Η
+					
Cooling fan rel	ay		Voltag	•	
Connector	Termina	I			J
E42	2				
(cooling fan relay-2)	5	Ground	Battery vol	tage	1Z
E43 (cooling fan relay-3)	2				K
Is the inspection result no YES >> GO TO 2.	rmal?				L
NO >> Perform troub	-		•		
 CHECK COOLING FAI Turn ignition switch O Disconnect IPDM E/R Check the continuity I tor. 	FF. harness c	onnectors.		s connectors and IPDM E/R harness connec-	M
+		_			0
Cooling fan relay IPDM E		IPDM E/F	२	Continuity	

Ŧ		—		
Cooling fan relay		IPDM E/R		Continuity
Connector	Terminal Connector		Terminal	
E42 (cooling fan relay-2)	1	E19	27	Existed
E43 (cooling fan relay-3)	1		39	Existed

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

Is the inspection result normal?

YES >> GO TO 3.

Revision: October 2015

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< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair or replace error-detected parts.

${\it 3.}$ check cooling fan motor power supply circuit

1. Disconnect cooling fan motor-1 harness connector.

2. Check the voltage between cooling fan motor-1 harness connector and ground.

+ Cooling fan motor-1		_	Voltage
Connector	Terminal	•	
E220	1 2	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.

NO >> Perform trouble diagnosis for power supply circuit.

4.CHECK COOLING FAN MOTOR CIRCUIT-1

- 1. Disconnect cooling fan motor-2 harness connector.
- 2. Check the continuity between cooling fan relay-2, -3 harness connectors and cooling fan motor-1, -2 harness connectors.

+		-		
Cooling fan relay		Cooling fan mot	or	Continuity
Connector	Terminal	Connector	Terminal	
E42	3	E221 (Cooling fan motor-2)	2	
(cooling fan relay-2)	7	E220 (Cooling fan motor-1)	3	Existed
E43	3	E221 (Cooling fan motor-2)	1	LAISteu
(cooling fan relay-3)	7	E220 (Cooling fan motor-1)	4	

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

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.CHECK COOLING FAN MOTOR CIRCUIT-2

 Check the continuity between IPDM E/R harness connector and cooling fan motor-1, -2 harness connector.

+		-		
IPDM E/R		Cooling fan motor		Continuity
Connector	Terminal	Connector	Terminal	
E17	4	E220 (Cooling fan motor-1)	4	Existed
	6	E221 (Cooling fan motor-2)	1	LAISIEU

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

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6.CHECK COOLING FAN MOTOR CIRCUIT-3

< DTC/CIRCUIT DIAGNOSIS >

1. Check the continuity between cooling fan relay-2, -3 harness connectors and ground.

		-		
-	÷			
Cooling	fan relay	-	Continuity	
Connector	Terminal			
E42 (cooling fan relay-2)) 6	Ground	Existed	
E43 (cooling fan relay-3)				
2. Also check ha		to ground and	to power.	
s the inspection re				
YES >> GO TO NO >> Repai	o 7. r or replace eri	or-detected pa	arts.	
7.CHECK COOL	•			
			notor-2 harness connector	r and ground
	landity betwee			
+				
Cooling fan n	notor-2	-	Continuity	
Connector	Terminal			
E221	3	Ground	Existed	
	4	Ground	LAISteu	
2. Also check ha	rness for short	to ground and	to power.	
Is the inspection re				
YES >> GO TO NO >> Repai		or datastad p	arto.	
8. CHECK COOL	r or replace er	•	ans.	
Refer to <u>EC-544. '</u>		spection (Coo	<u>ing Fan Relay)"</u> .	
Is the inspection re YES >> GO Te				
	ce malfunction	ing cooling far	n relay.	
9.CHECK COOL	ING FAN MOT	ORS-1 AND -2	2	
Refer to <u>EC-543.</u> '	Component In	spection (Coo	ing Fan Motor)"	
Is the inspection re			<u></u>	
YES >> GO T				
			n motor. Refer to <u>CO-16, "F</u>	Removal and Installation".
10. CHECK INTE	ERMITTENT IN	ICIDENT		
Perform . <u>GI-41, "lı</u>	ntermittent Inci	dent"		
Is the inspection re	esult normal?			
			36, "Removal and Installat	tion".
	r or replace er	-		
Component In		-		INFOID:000000011940014
1.CHECK COOL	ING FAN MOT	OR		
1. Turn ignition s	witch OFF.			
	oling fan moto		nector. Itery voltage and check on	

3. Supply cooling fan motor terminals with battery voltage and check operation.

Cooling			
Terr	Terminal		
+	-		
1	3 and 4		
2	3 and 4	А	
1 and 2	3	~	
1 and 2	4		
1, 2	3, 4	В	

Check that cooling fan speed of condition B is higher than that of A.

Is the inspection result normal?

YES >> INSPECTION END

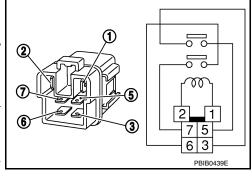
NO >> Replace cooling fan motor. Refer to <u>CO-16, "Removal and Installation"</u>.

Component Inspection (Cooling Fan Relay)

1. CHECK COOLING FAN RELAYS

- 1. Turn ignition switch OFF.
- 2. Remove cooling fan relay-2, -3.
- 3. Check the continuity between cooling fan relay-2, -3 terminals as per the following conditions.

Cooling fai	n relay-2, -3		
+	_	Conditions	Continuity
Terr	minal		
5	3	12V direct current supply between termi- nals 1 and 2	Existed
		No current supply	Not existed
7	6	12V direct current supply between termi- nals 1 and 2	Existed
		No current supply	Not existed



Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace cooling fan relay.

INFOID:000000011940015

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.
- 3. Select "LOAD SIGNAL" and check indication under the following conditions.

Monitor item	Monitor item Condition		Indication
LOAD SIGNAL	Rear window defogger switch	ON	ON
LOAD SIGNAL	Real window delogger switch	OFF	OFF
Is the inspection result normal?			

YES	>> GO TO 2.	

. = •	
NO	>> Proceed to EC-545, "Diagnosis Procedure".
\mathbf{O}	

2.CHECK LIGHTING SWITCH FUNCTION

Check "LOAD SIGNAL" indication under the following conditions.

Monitor item	Co	ondition	Indication
LOAD SIGNAL	Lighting switch	ON at 2nd position	ON
LOAD SIGNAL	Lighting switch	OFF	OFF

Is the inspection result normal?

YES	>> GO TO 3.
NO	>> Proceed to <u>EC-545, "Diagnosis Procedure"</u> .

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
HEATENTAN SW	rieater fan control Switch	OFF	OFF

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to EC-545, "Diagnosis Procedure".

Diagnosis Procedure

1.INSPECTION START

Confirm the malfunctioning circuit (rear window defogger, headlamp or heater fan). Refer to <u>EC-545, "Compo-</u> nent 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-16, "Work Flow".

INFOID:000000011940016

INFOID-000000011940017

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INFOID:000000011940018

ELECTRICAL LOAD SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

3.CHECK HEADLAMP SYSTEM

>> INSPECTION END

Check headlamp system. Refer to <u>EXL-66, "Work Flow"</u> (LED headlamp) or <u>EXL-186, "Work Flow"</u> (halogen headlamp).

>> INSPECTION END

4.CHECK HEATER FAN CONTROL SYSTEM

Check heater fan control system. Refer to HAC-43, "Work Flow".

>> INSPECTION END

ELECTRONIC CONTROLLED ENGINE MOUNT

< DTC/CIRCUIT DIAGNOSIS >

ELECTRONIC CONTROLLED ENGINE MOUNT

[VQ35DE]

LEEOINOI				•	А
Component F	Function Che	ck		INFCID:000000011940019	
1.CHECK OVE	RALL FUNCTION	N			EC
 Shift selecto Disconnect e 	electronic control ody vibration inc	nile depressing the led engine moun	he brake pedal and t control solenoid	l parking brake pedal. valve harness connector. of step 2 above (with vehicle stopped).	С
	PECTION END 547, "Diagnosis F	Procedure".			D
Diagnosis Pro	ocedure			INFCID:000000011940020	
1.CHECK VACU	JUM SOURCE				E
3. Disconnect v	electronic controll		t control solenoid v	valve harness connector. jine mount.	F
	um hose for vacu	um existence.			G
Vacuum	should exist.				
Is the inspection					Н
YES >> GO NO >> GO	-				
2.CHECK VACU	JUM HOSES AN	ID VACUUM GAL	LERY		
	um hoses and va		r clogging, cracks JNT : System Des	or improper connection. Refer to <u>EC-43.</u> cription".	J
Is the inspection					
YES >> GO NO >> Repa	TO 3. air or replace vac	cuum hoses and	vacuum gallery.		Κ
3.CHECK ELEC	CTRONIC CONT	ROLLED ENGIN	E MOUNT CONTF	ROL SOLENOID VALVE POWER SUPPLY	
 Disconnect e Turn ignition 		led engine moun	t control solenoid	valve harness connector.	L
		ront electronic co	ntrolled engine mo	ount harness connector and ground.	B. 4
	+				M
	lled engine mount enoid valve	_	Voltage		Ν
Connector	Terminal				
F64	1	Ground	Battery voltage		0
Is the inspection YES >> GO NO >> Repair	TO 4.	hort to ground or	^r short to power in	harness connectors.	D
4.CHECK ELEC	CTRONIC CONT		NE MOUNT CON	TROL SOLENOID VALVE OUTPUT SIG-	Г
NAL CIRCUIT FO					
2. Check the c	ECM harness con continuity betwee ve harness conne	en ECM harness	connector and el	ectronic controlled engine mount control	

ELECTRONIC CONTROLLED ENGINE MOUNT

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

E	СМ		ntrolled engine solenoid valve	Continuity
Connector	Terminal	Connector	Terminal	
F13	49	F64	2	Existed

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

Is the inspection result normal?

YES >> GO TO 5.

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

5.CHECK ELECTRONIC CONTROLLED ENGINE MOUNT CONTROL SOLENOID VALVE

Check electronic controlled engine mount control solenoid valve. Refer to <u>EC-548</u>, "Component Inspection". Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace electronic controlled engine mount control solenoid valve. Refer to <u>EC-15, "ENGINE</u> <u>CONTROL SYSTEM : Component Parts Location"</u>.

6.CHECK ELECTRONIC CONTROLLED ENGINE MOUNT

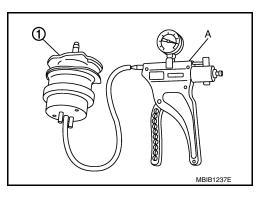
1. Turn ignition switch OFF.

- Install vacuum pump (A) to electronic controlled engine mount
 1.
- Check that a vacuum is maintained when applying the vacuum of -40 kPa (-0.4 bar, -0.41 kg/cm², -5.8 psi) to electronic controlled engine mount.
- 4. Also visually check electronic controlled engine mount.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace electronic controlled engine mount.



7. CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

- YES >> Replace intake manifold collector. Refer to EM-27, "Removal and Installation".
- NO >> Repair or replace error-detected parts.

Component Inspection

INFOID:0000000011940021

1. CHECK ELECTRONIC CONTROLLED ENGINE MOUNT CONTROL SOLENOID VALVE

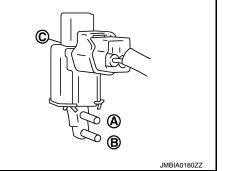
With CONSULT

- 1. Turn ignition switch OFF.
- 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 \textcircled{A} and \textcircled{C}
TRVL	Existed	Not existed
IDLE	Not existed	Existed

Without CONSULT

1. Turn ignition switch OFF.

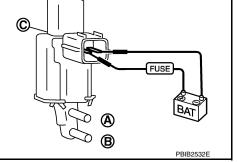


ELECTRONIC CONTROLLED ENGINE MOUNT

< DTC/CIRCUIT DIAGNOSIS >

- 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 \textcircled{A} and \textcircled{B}	Air passage continuity between \textcircled{A} and \textcircled{C}
12 V direct current supply be- tween terminals 1 and 2	Existed	Not existed
No supply	Not existed	Existed



[VQ35DE]

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace electronic controlled engine mount control solenoid valve. Refer to <u>EC-15, "ENGINE</u> <u>CONTROL SYSTEM : Component Parts Location"</u>.



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< DTC/CIRCUIT DIAGNOSIS >

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-550, "Diagnosis Procedure".

2. CHECK FUEL INJECTOR FUNCTION

- 1. Start engine.
- 2. Perform "POWER BALANCE" in "ACTIVE TEST" mode with CONSULT.
- 3. Check that each circuit produces a momentary engine speed drop.

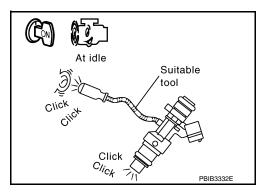
Without CONSULT

- 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-550. "Diagnosis Procedure".



Diagnosis Procedure

INFOID:0000000011940023

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		-	Voltage
Cylinder	Connector	Terminal		
1	F17	1		
2	F18	1		
3	F19	1	Ground	Patton
4	F20	1	Giouna	Battery voltage
5	F21	1	1	
6	F22	1	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.

INFOID:000000011940022

FUEL INJECTOR

< DTC/CIRCUIT DIAGNOSIS >

	Fuel injector		IPDN	/IE/R	A H H	_
Cylinder	Connector	Terminal	Connector	Terminal	Continuity	
1	F17	1		54		_
2	F18	1	-	60		
3	F19	1	550	54	Eviete d	
4	F20	1	F50	60	Existed	
5	F21	1		54		
6	F22	1		60		
YES >> NO >> .CHECK F	Repair or rep	rouble diagr lace error-de FOR OUTPL	nosis for powe etected parts JT SIGNAL C		uit. OPEN AND SI	HORT
. Disconn	ition switch (ect ECM har he continuity	ness conneo		ness connect	or and ECM ha	rness connector.
	Fuel injector		EC	CM	Continuity	-
Cylinder	Connector	Terminal	Connector	Terminal	Continuity	
1	F17	2		17		-
2	F18	2		16		
3	F19	2	F13	22	Existed	
4	F20	2	115	12	LAISted	
5	F21	2		11		
6	F22	2		21		
YES >> NO >> CHECK F heck fuel in the inspec YES >> NO >> CHECK I	FUEL INJECT njector. Refer ction result no GO TO 5. Replace malt NTERMITTE	circuit, short FOR to <u>EC-551,</u> ormal? functioning f NT INCIDEN	" <u>Component</u> uel injector. F NT	Inspection". Refer to <u>EM-4</u>	er in harness o	
	nittent incide		GI-41, "Interm	intent incider	<u>IL</u> .	
YES >>	Replace IPD	M E/R. Refe	r to <u>PCS-36,</u> etected parts		<u>d Installation"</u> .	
	nt Inonact	ion				
Compone	ni inspeci					INFOID:0000000119400
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Turn ignition switch OFF.
 Disconnect fuel injector harness connector.

FUEL INJECTOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

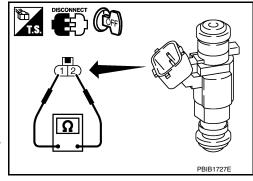
3. Check resistance between fuel injector terminals as per the following.

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

NO >> Replace malfunctioning fuel injector. Refer to <u>EM-46.</u> <u>"Removal and Installation"</u>.



< DTC/CIRCUIT DIAGNOSIS >

FUEL PUMP

Component Function Check

1.CHECK FUEL PUMP FUNCTION

- 1. Turn ignition switch ON.
- 2. Pinch fuel feed hose with two fingers.

<□ : Vehicle front

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-553, "Diagnosis Procedure".

Diagnosis Procedure

ALBIA1341ZZ

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.

	E	CM		
	+		_	Voltage
Connector	Terminal	Connector	Terminal	
F13	19	E10	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.

	+ // E/R		Voltago	
		_	Voltage	
Connector	Terminal			
F51	69	Ground	Battery voltage	
Is the inspection result normal?				
YES >> GO				
NO >> GO	TO 7.			
3.CHECK FUE	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.

E	СМ	IPDI	II E/R	Continuity
Connector	Terminal	Connector	Terminal	Continuity
F13	19	F51	69	Existed

Revision: October 2015

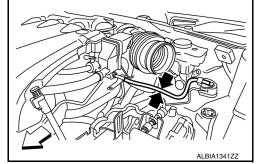
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< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

- YES >> Perform the trouble diagnosis for power supply circuit.
- NO >> Repair or replace error-detected parts.

4.CHECK FUEL PUMP POWER SUPPLY CIRCUIT

- 1. Disconnect "fuel level sensor unit and fuel pump" harness connector.
- Check the continuity between IPDM E/R harness connector and "fuel level sensor unit and fuel pump" harness connector.

IPDI	M E/R		sor unit and fuel	Continuity
Connector	Terminal	Connector	Terminal	
E18	15	B42	6	Existed

Is the inspection result normal?

YES >> GO TO 5.

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

5.CHECK FUEL PUMP GROUND CIRCUIT

- 1. Disconnect "fuel level sensor unit and fuel pump" harness connector.
- 2. Check the continuity between "fuel level sensor unit and fuel pump" harness connector and ground.

	sor unit and fuel	Ground	Continuity
Connector	Terminal		
B42	4	Ground	Existed

Is the inspection result normal?

YES >> GO TO 6.

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

6.CHECK FUEL PUMP

Check fuel pump. Refer to EC-554, "Component Inspection(Fuel Pump)".

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace "fuel filter and fuel pump assembly". Refer to <u>FL-5, "Removal and Installation"</u>.

7.CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

- YES >> Replace IPDM E/R. Refer to PCS-36, "Removal and Installation".
- NO >> Repair or replace error-detected parts.

Component Inspection(Fuel Pump)

INFOID:000000011940027

1.CHECK FUEL PUMP

- 1. Turn ignition switch OFF.
- 2. Disconnect "fuel level sensor unit and fuel pump" harness connector.
- 3. Check resistance between "fuel level sensor unit and fuel pump" terminals as follows.

Terminals	Resistance (Ω)
4 and 6	0.2 - 5.0 [at 25°C (77°F)]

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace "fuel filter and fuel pump assembly". Refer to <u>FL-5</u>, "<u>Removal and Installation</u>".

< DTC/CIRCUIT DIAGNOSIS >

Component Function Check Descention start Component Function Start 1.INSPECTION START EC Turn ignition switch OFF, and restart engine. Does file engine start? C VES-1 >> With CONSULT: GO TO 2. YES-2 >> With CONSULT: GO TO 2. C YES-1 >> With CONSULT: GO TO 2. YES-1 >> With CONSULT: GO TO 2. C 2. CHECK IGNITION SIGNAL FUNCTION D D @With CONSULT YES >> INSPECTION END D 1. Perform POWER BALANCE" in "ACTIVE TEST" mode with CONSULT. E 2. CHECK IGNITION SIGNAL FUNCTION P With CONSULT F 3. CHECK INTION SIGNAL FUNCTION F 3. CHECK INTION SIGNAL FUNCTION G Without CONSULT F 1. Let engine idle. Set and the voltage signal between ECM harness connector terminals with an oscilloscope. The file wold changes depending on pm at Idle. Immediate wold wold wold wold wold wold wold wold	IGNITIO	N SIGNA	۹L					А
Turni ignition switch OFF, and restart engine. Description of the angine start? C VES-1 >> With CONSULT: GO TO 2. C YES-2 >> Without CONSULT: GO TO 3. D NO >> Proceed to EC-555. "Diagnosis Procedure". D 2. CHECK IGNITION SIGNAL FUNCTION D Is the inspection result normal? F 2. Check IGNITION SIGNAL FUNCTION E 3. CHECK IGNITION SIGNAL FUNCTION F 3. CHECK IGNITION SIGNAL FUNCTION F Without CONSULT 1. Let engine idle. 3. CHECK IGNITION SIGNAL FUNCTION G Without CONSULT 6 1. Let engine idle. F 2. Read the voltage signal between ECM harness connector terminals with an oscilloscope. H Image: Terminal function for terminal functin for terminal function for terminal function for ter	Compone	nt Function	on Check				INFOID:000000011940029	A
Turn ignition switch OFF, and restart engine. C Does the engine start? YES-1 >> With CONSULT: GO TO 2. YES-2 >> With CONSULT: GO TO 2. YES-2 YES-1 >> Kinh CONSULT: GO TO 10 D 2. CHECK IGNITION SIGNAL FUNCTION D @ With CONSULT 1. Perform "POWER BALANCE" in "ACTIVE TEST" mode with CONSULT. E 2. Check KIGNITION SIGNAL FUNCTION D With a each circuit produces a momentary engine speed drop. Is the inspection result normal? YES >> INSPECTION END F NO >> Proceed to EC-555. "Diagnosis Procedure". 3. CHECK IGNITION SIGNAL FUNCTION @ @ Without CONSULT F 1. Let engine idle. Connector Terminal 1. Let engine idle. F 2. Read the voltage signal between ECM harness connector terminals with an oscilloscope. H WITE: The pulse cycle changes depending on rpm at idle. L Is the inspection result normal? Voltage signal K NOT >> Proceed to EC-555. "Diagnosis Procedure". M N NOT >> Proceed to EC-555. "Diagnosis Procedure". M N NOT >> Proceed to EC-555. "Diagnosis Procedure". M	1.INSPECT	TION START	г					EC
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$\begin{array}{c} \text{YES-2} > \text{Without CONSULT: GO TO 3.} \\ \text{YES-2} > \text{Vithout CONSULT: GO TO 3.} \\ \text{NO} \qquad > \text{Proceed to EC-S55. "Diagnosis Procedure".} \\ \hline \textbf{2. CHECK IGNITION SIGNAL FUNCTION} \\ \hline \textbf{3. CHECK IGNITION SIGNAL FUNCTION} \\ \hline \textbf{3. Check that each circuit produes a momentary engine speed drop.} \\ \hline \textbf{3. In the insection result normal?} \\ \text{YES > NSPECTION END} \\ \text{NO} \qquad > \text{Proceed to EC-S55. "Diagnosis Procedure".} \\ \hline \textbf{3. CHECK IGNITION SIGNAL FUNCTION} \\ \hline \textbf{4. totege signal between ECM harness connector terminals with an oscilloscope.} \\ \hline 4. totege signal for the second signa$		-						C
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NO >> Proceed to EC-555. "Diagnosis Procedure". 3. CHECK IGNITION SIGNAL FUNCTION Image: Signal between ECM harness connector terminals with an oscilloscope. Image: Signal between ECM harness connector terminals with an oscilloscope. Image: Signal between ECM harness connector terminals with an oscilloscope. Image: Signal between ECM harness connector terminals with an oscilloscope. Image: Signal between ECM harness connector terminal Image: Signal between ECM harness connector terminals. Image: Signal between ECM harness connector terminal I								_
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Connector Terminal Connector Terminal 103 104 103 104 J 104 106 E10 152 50mSec/div J F14 107 E10 152 50mSec/div J NOTE: The pulse cycle changes depending on rpm at idle. J J J Is the inspection result normal? YES >> INSPECTION END M NO >> Proceed to EC-555. "Diagnosis Procedure". M Diagnosis Procedure N N 1. CHECK ECM POWER SUPPLY I. Turn ignition switch OFF, wait at least 10 seconds and then turn it ON. O 2. Check the voltage between ECM harness connector terminals. O Image: the second terminal is the image of the second terminal is the second		E	СМ		_			
103 104 104 106 111 1			Connector	- Torminal	_	Voltage signal		
Indi	Connector		Connector	Terminal				
F14 107 E10 152 Image: Second			-			50mSec/div		J
107 113 Image: Second sec	544	106	E 40	450				
113 114 2V/div JMBIA0035GB NOTE: The pulse cycle changes depending on rpm at idle. Is the inspection result normal? YES >> INSPECTION END NO M NO >> Proceed to EC-555, "Diagnosis Procedure". M Diagnosis Procedure MFOID 000000011940030 N 1. CHECK ECM POWER SUPPLY 1. Turn ignition switch OFF, wait at least 10 seconds and then turn it ON. 0 2. Check the voltage between ECM harness connector terminals. 0 Image: the image of the	F14	107	EIU	152	÷			K
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Is the inspection result normal? M YES >> INSPECTION END M NO >> Proceed to EC-555, "Diagnosis Procedure". N Diagnosis Procedure N N 1. CHECK ECM POWER SUPPLY N N 1. Turn ignition switch OFF, wait at least 10 seconds and then turn it ON. O 2. Check the voltage between ECM harness connector terminals. O YEOL Connector Terminal YEOL Connector Terminal YEOL Connector Terminal YEOL Connector Terminal P		cycle changes	s depending on	rpm at idle.				L
NO >> Proceed to EC-555, "Diagnosis Procedure". Diagnosis Procedure N 1.CHECK ECM POWER SUPPLY N 1. Turn ignition switch OFF, wait at least 10 seconds and then turn it ON. O 2. Check the voltage between ECM harness connector terminals. P ECM Voltage + - Voltage ECM Voltage P	-							
Diagnosis Procedure INFOLD.00000011940030 N 1. CHECK ECM POWER SUPPLY 1. Turn ignition switch OFF, wait at least 10 seconds and then turn it ON. 0 2. Check the voltage between ECM harness connector terminals. 0 Image: the voltage between ECM harness connector terminals. 0 Image: the voltage between ECM harness connector terminals. 0 Image: the voltage between ECM harness connector terminals. 0 Image: the voltage between ECM harness connector terminals. 0 Image: the voltage between ECM harness connector terminal 0 Image: the voltage between ECM harness connector terminal 0 Image: the voltage between ECM harness connector terminal 0 Image: the voltage between ECM harness connector terminal 0 Image: the voltage between ECM harness connector terminal 0 Image: the voltage between ECM harness connector terminal 0 Image: the voltage between ECM harness connector terminal 0 Image: the voltage between ECM harness connector terminal 0 Image: the voltage between ECM harness connector terminal 0 Image: the voltage between ECM harness connector terminal 0 Image: the voltage between ECM harnese terminal 0				anocio Pro	ooduro"			M
1. CHECK ECM POWER SUPPLY 1. Turn ignition switch OFF, wait at least 10 seconds and then turn it ON. 0 2. Check the voltage between ECM harness connector terminals. 0 <u>ECM</u> <u>+</u> <u>-</u> <u>Voltage</u> <u>Voltage</u> <u>F14 86 E10 152 Battery voltage <u>Battery voltage </u> <u>Voltage </u> <u>Connector Terminal F14 86 E10 152 Battery voltage </u></u>					<u></u> .			
1. Turn ignition switch OFF, wait at least 10 seconds and then turn it ON. 0 2. Check the voltage between ECM harness connector terminals. 0 ECM Voltage + - Connector Terminal F14 86 E10 152 Battery voltage							INFOID:000000011940030	Ν
2. Check the voltage between ECM harness connector terminals. ECM Voltage + - Voltage Connector Terminal Connector Terminal F14 86 E10 152 Battery voltage	1. CHECK E	ECM POWE	R SUPPLY					
ECM Voltage + - Connector Terminal F14 86 E10 152 Battery voltage								0
+-VoltageConnectorTerminalConnectorTerminalF1486E10152Battery voltage		ne volaye b				ธ าาาแา ต เอ.		
ConnectorTerminalConnectorTerminalF1486E10152Battery voltage			ECM					Р
F14 86 E10 152 Battery voltage		+		_		Voltage		
le the increation regult normal'				10	152	Battery voltage		

YES >> GO TO 2.

>> Refer to EC-190, "Diagnosis Procedure". NO

< DTC/CIRCUIT DIAGNOSIS >

$\overline{2.\text{CHECK}}$ condenser-1 power supply

- 1. Turn ignition switch OFF.
- 2. Disconnect condenser-1 harness connector.
- 3. Turn ignition switch ON.
- 4. Check the voltage between condenser-1 harness connector and ground.

	+		
Conde	enser-1	_	Voltage
Connector	Terminal		
F26	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.CHECK CONDENSER-1 POWER SUPPLY CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect IPDM E/R harness connector.
- 3. Check the continuity between IPDM E/R harness connector and condenser-1 harness connector.

IPDN	/I E/R	Conde	enser-1	Continuity
Connector	Terminal	Connector	Terminal	Continuity
F50	55	F26	1	Existed

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

Is the inspection result normal?

YES >> Refer to EC-190, "Diagnosis Procedure".

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

4.CHECK CONDENSER-1 GROUND CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Check the continuity between condenser-1 harness connector and ground.

Conde	enser-1	Ground	Continuity
Connector	Terminal	Ground	Continuity
F26	2	Ground	Existed

3. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 5.

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

5.CHECK CONDENSER-1

Check condenser-1. Refer to EC-559, "Component Inspection (Condenser-1)"

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace condenser-1.

6.CHECK IGNITION COIL POWER SUPPLY

- 1. Reconnect all harness connectors disconnected.
- 2. Disconnect ignition coil harness connector-1.
- 3. Turn ignition switch ON.
- 4. Check the voltage between ignition coil harness connector and ground.

< DTC/CIRCUIT DIAGNOSIS >

	+						А
	Ignition coil		_	Voltage			
Cylinder	Connector	Terminal					EC
1	F34	3					LO
2	F35	3					
3	F36	3	Cround	Detter valt			С
4	F37	3	Ground	Battery volta	age		
5	F38	3					
6	F39	3					D
Is the inspect	ion result no	rmal?					
	GO TO 7.	_					Е
	Repair or repl						
7. CHECK 10	GNITION CO	IL GROUNI	O CIRCUIT	FOR OPEN	AND SHORT		_
	tion switch O						F
2. Check th	e continuity b	petween ign	ition coil ha	rness conne	ctor and ground		
	1	- 11					G
	Ignition c	OIL		Ground	Continuity		
Cylinder	Connecte	or Ter	minal		,		
1	F34		2				Н
2	F35		2				
	1						

Ground

Existed

3. Also check harness for short to power.

F36

F37

F38

F39

Is the inspection result normal?

YES >> GO TO 8.

3

4

5

6

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

2

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 $\mathbf{8}$. 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		EC	CM	Continuity
Cylinder	Connector	Terminal	Connector	Terminal	Continuity
1	F34	1		113	
2	F35	1		106	-
3	F36	1	F14	103	Existed
4	F37	1	F 14	114	Existed
5	F38	1		107	-
6	F39	1		104	1

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

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< DTC/CIRCUIT DIAGNOSIS >

Check ignition coil with power transistor. Refer to <u>EC-558</u>, "Component Inspection (Ignition Coil with Power <u>Transistor)</u>".

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
- NO >> Replace malfunctioning ignition coil with power transistor. Refer to <u>EM-45</u>, "<u>Removal and Installa-</u> tion (LH)", <u>EM-45</u>, "<u>Removal and Installation (RH)</u>".

Component Inspection (Ignition Coil with Power Transistor)

INFOID:000000011940031

1. CHECK IGNITION COIL WITH POWER TRANSISTOR-I

- 1. Turn ignition switch OFF.
- 2. Disconnect ignition coil harness connector.
- 3. Check resistance between ignition coil terminals as per the following.

Terminal No. (Polarity)	Resistance Ω [at 25°C (77°F)]
1 and 2	Except 0 or ∞
1 and 3	- Except 0
2 and 3	Except 0

Is the inspection result normal?

- YES >> GO TO 2.
- NO >> Replace malfunctioning ignition coil with power transistor. Refer to <u>EM-45. "Removal and Installa-</u> tion (LH)", <u>EM-45. "Removal and Installation (RH)</u>".

2.CHECK IGNITION COIL WITH POWER TRANSISTOR-II

CAUTION:

Perform the following procedure in a place with no combustible objects and good ventilation.

- 1. Turn ignition switch OFF.
- 2. Reconnect all harness connectors disconnected.
- 3. 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.

- 4. Start engine.
- 5. After engine stalls, crank it 2 or 3 times to release all fuel pressure.
- 6. Turn ignition switch OFF.
- 7. Remove all ignition coil harness connectors to avoid the electrical discharge from the ignition coils.
- 8. Remove ignition coil and spark plug of the cylinder to be checked.
- 9. Crank engine for 5 seconds or more to remove combustion gas in the cylinder.
- 10. Connect spark plug and harness connector to ignition coil.
- 11. Fix ignition coil using a rope etc. with gap of 13 17 mm (0.52 0.66 in) between the edge of the spark plug and grounded metal portion as shown in the figure.
- 12. Crank engine for approximately 3 seconds, and check whether spark is generated between the spark plug and the grounded metal portion.

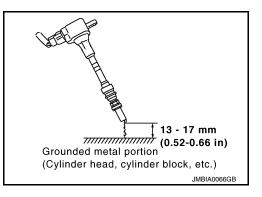
Spark should be generated.

CAUTION:

- 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?



>> Replace malfunctioning ignition coil with power transistor. Refer to EM-45, "Removal and Installa-

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1.CHECK CONDENSER-1 1. Turn ignition switch OFF.

< DTC/CIRCUIT DIAGNOSIS >

>> INSPECTION END

YES

NO

Disconnect condenser-1 harness connector.

Component Inspection (Condenser-1)

3. Check resistance between condenser-1 terminals as per the following.

tion (LH)", EM-45, "Removal and Installation (RH)".

Terminals	Resistance
1 and 2	Above 1 M Ω [at 25C° (77C°)]

Is the inspection result normal?

YES >> INSPECTION END NO >> Replace condenser-1. INFOID:000000011940032

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< DTC/CIRCUIT DIAGNOSIS >

INFORMATION DISPLAY (ASCD)

Component Function Check

1. CHECK INFORMATION DISPLAY

1. Start engine.

- 2. Press MAIN switch on ASCD steering switch.
- 3. Drive the vehicle at more than 40 km/h (25 MPH). CAUTION:

Always drive vehicle at a safe speed.

- 4. Press SET/COAST switch.
- 5. Check that the reading of the speedometer shows the same value as the set speed indicated in the information display while driving the vehicle on a flat road.

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Proceed to EC-560. "Diagnosis Procedure".

Diagnosis Procedure

1.CHECK DTC

Check that DTC UXXXX, P0500 or P1574 is not displayed.

- Is the inspection result normal?
- YES >> GO TO 2.
- NO-1 >> Perform trouble diagnosis for DTC UXXXX.
- NO-2 >> Perform trouble diagnosis for DTC P0500. Refer to EC-386, "DTC Description".
- NO-3 >> Perform trouble diagnosis for DTC P1574. Refer to EC-482. "DTC Description".

2. CHECK DTC WITH COMBINATION METER

Refer to MWI-20, "CONSULT Function (METER/M&A)".

Is the inspection result normal?

- YES >> GO TO 3.
- NO >> Perform trouble diagnosis for DTC indicated.

3.CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

- YES >> Replace combination meter. Refer to <u>MWI-68, "Removal and Installation"</u>.
- NO >> Repair or replace.

INFOID:000000011940033

INFOID:000000011940034

MALFUNCTION INDICATOR LAMP

< DTC/CIRCUIT DIAGNOSIS >	[VQ35DE]	
MALFUNCTION INDICATOR LAMP		
Component Function Check	INFOID:000000011940035	A
1.CHECK MIL FUNCTION		EC
1. Turn ignition switch ON.		
 2. Check that MIL illuminates. <u>Is the inspection result normal?</u> YES >> INSPECTION END 		С
NO >> Proceed to <u>EC-561, "Diagnosis Procedure"</u> .		
Diagnosis Procedure	INFOID:000000011940036	D
1.снеск дтс		E
Check that DTC UXXXX is not displayed.		
Is the inspection result normal?		
YES >> GO TO 2.		F
NO >> Perform trouble diagnosis for DTC UXXXX.		
2.CHECK COMBINATION METER FUNCTION		0
Check combination meter function. Refer to <u>MWI-20, "CONSULT Function (METER/M&A)"</u> .		G
Is the inspection result normal?		
YES >> GO TO 3. NO >> Repair or replace.		Н
3.CHECK INTERMITTENT INCIDENT		
Check intermittent incident. Refer to <u>GI-41, "Intermittent Incident"</u> .		
Is the inspection result normal?		
 YES >> Replace combination meter. Refer to <u>MWI-68, "Removal and Installation"</u>. NO >> Repair or replace error-detected parts. 		J
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		K
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ON BOARD REFUELING VAPOR RECOVERY (ORVR)

< DTC/CIRCUIT DIAGNOSIS >

ON BOARD REFUELING VAPOR RECOVERY (ORVR)

Component Function Check

1.CHECK ORVR FUNCTION

Check whether the following symptoms are present.

- Fuel odor from EVAP canister is strong.
- Cannot refuel/Fuel odor from the fuel filler opening is strong while refueling.

Are any symptoms present?

YES >> Proceed to EC-562, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

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.

<u>A or B</u>

A >> GO TO 2.

B >> GO TO 7.

2. CHECK EVAP CANISTER

- Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached. Refer to <u>FL-15</u>. "<u>Removal and Installation</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?

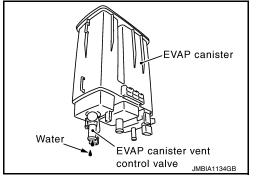
YES >> GO TO 3. NO >> GO TO 4.

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. NO >> GO TO 6.



4.REPLACE EVAP CANISTER

Replace EVAP canister with a new one. Refer to FL-15, "Removal and Installation".

>> 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 <u>FL-17, "Exploded View"</u>.

6.CHECK REFUELING EVAP VAPOR CUT VALVE

Check refueling EVAP vapor cut valve. Refer to EC-564, "Component Inspection".

EC-562

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ON BOARD REFUELING VAPOR RECOVERY (ORVR)

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

Is the inspection result normal?	
YES >> INSPECTION END	
NO >> Replace refueling EVAP vapor cut valve with fuel tank. R	keter to <u>FL-10, "Removal and Installation"</u> .
7.CHECK EVAP CANISTER	E
1. Remove EVAP canister with EVAP canister vent control valve a	nd EVAP control system pressure sensor
 attached. Refer to <u>FL-15, "Removal and Installation"</u>. Weigh the EVAP canister with EVAP canister vent control valve a 	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.	EVAP canister
	Water Water
	EVAP canister vent
0	control valve JMBIA1134GB
9.REPLACE EVAP CANISTER Replace EVAP canister with a new one. Refer to <u>FL-15</u> , " <u>Removal an</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 <u>FL-17, "Exploded</u>	d View".
11.CHECK VENT HOSES AND VENT TUBES	
Check hoses and tubes between EVAP canister and refueling control improper connection.	ol valve for clogging, kinks, looseness and
Is the inspection result normal?	1
YES >> GO TO 12.	
NO >> Repair or replace hoses and tubes.	
12.CHECK FILLER NECK TUBE	I
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-564, "Component	nt Inspection".
Is the inspection result normal?	
YES >> GO TO 14.	
NO >> Replace refueling EVAP vapor cut valve with fuel tank. R	Refer to FL-10, "Removal and Installation".
14.CHECK FUEL FILLER TUBE	
Check filler neck tube and hose connected to the fuel tank for cloggi	ng, dents and cracks.
	-

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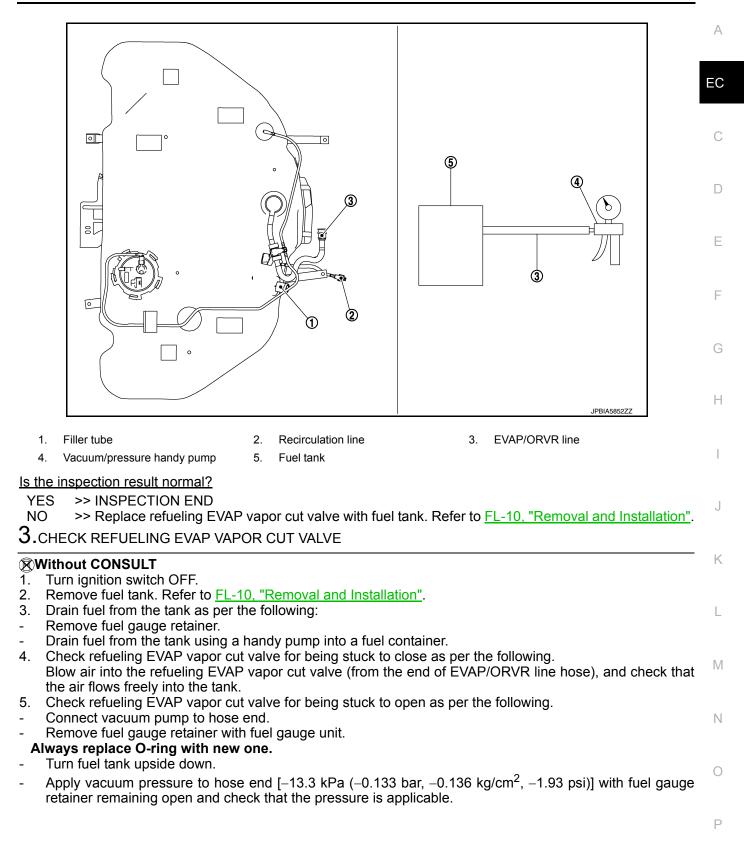
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ON BOARD REFUELING VAPOR REC					
< DTC/CIRCUIT DIAGNOSIS >	[VQ35DE]				
Is the inspection result normal?					
YES >> GO TO 15.					
NO >> Replace fuel filler tube. Refer to <u>FL-10, "Removal and Ins</u>	<u>tallation"</u> .				
15.CHECK ONE-WAY FUEL VALVE-I					
Check one-way valve for clogging.					
Is the inspection result normal?					
YES >> GO TO 16. NO >> Repair or replace one-way fuel valve with fuel tank. Refer	to EL-10 "Removal and Installation"				
16. CHECK ONE-WAY FUEL VALVE-II					
1. Check that fuel is drained from the tank.					
 Remove fuel filler tube and hose. Refer to <u>FL-10, "Removal and li</u> 	nstallation".				
3. Check one-way fuel valve for operation as per the following.	After removing filler tube				
When a stick is inserted, the valve should open, when removing stick it should close.					
Do not drop any material into the tank.	One-way fuel valve				
Is the inspection result normal?					
YES >> INSPECTION END					
NO >> Replace fuel filler tube or replace one-way fuel valve with fuel tank. Refer to <u>FL-10</u> , " <u>Removal and Installa-</u>					
tion".					
	Fuel tank				
Component Inspection	SEF665U				
	INFOID:000000011940039				
1.INSPECTION START					
Will CONSULT be used?					
Will CONSULT be used?					
YES >> GO TO 2.					
NO >> GO TO 3. 2 OUT OUT NOT DEFINE THE REPORT OF THE R					
2.CHECK REFUELING EVAP VAPOR CUT VALVE					
 Turn ignition switch OFF. Remove fuel tank. Refer to <u>FL-10, "Removal and Installation"</u>. 					
3. Drain fuel from the tank as per the following:					
- Remove fuel feed hose located on the fuel gauge retainer. Refer to FL-10, "Removal and Installation".					
 Connect a spare fuel hose, one side to fuel gauge retainer where the hose was removed and the other side to a fuel container. 					
- Drain fuel using "FUEL PUMP RELAY" in "ACTIVE TEST" mode					
 Check refueling EVAP vapor cut valve for being stuck to close as Blow air into the refueling EVAP vapor cut valve (from the end of 	per the following. 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 (-0.133 bar, -0. retainer remaining open and check that the pressure is applicable 					
retainer remaining open and encok that the pressure is applicable	•				

ON BOARD REFUELING VAPOR RECOVERY (ORVR)

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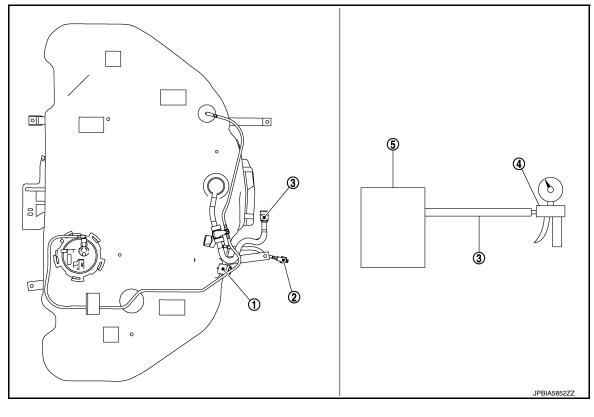
[VQ35DE]



ON BOARD REFUELING VAPOR RECOVERY (ORVR)

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]



1. Filler tube

- 4. Vacuum/pressure handy pump
- Recirculation line
 Fuel tank
- 3. EVAP/ORVR line

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace refueling EVAP vapor cut valve with fuel tank. Refer to <u>FL-10, "Removal and Installation"</u>.

< DTC/CIRCU				CESSURE S	ENSOR [VQ35DE]	
REFRIGE			SENSO	R	[]	
					А	
Component Function Check						
1.CHECK REFRIGERANT PRESSURE SENSOR FUNCTION						EC
2. Turn A/C s	e and warm it witch and blov voltage betwe	wer fan switcl	h ÓN.		der the following conditions.	С
	ECM					
Connector	+ Ti	erminal	Voltag	ge (V)		D
F13	20	25	1.0 -	4.0		Е
	SPECTION EI	ND	is Procedure	<u>3"</u> .	INFOID:000000011940041	F
						C
1. Disconnect	refrigerant pi			OWER SUPPLY		G
	n switch ON. voltage betwe	en refrigeran	t pressure s	ensor harness c	onnector and ground.	Η
Define ende	+					
Connector	oressure sensor Terminal		V	oltage (V)		
E219	1	Grou	ind A	pprox. 5		J
YES >> GC NO >> GC	Is the inspection result normal? YES >> GO TO 3.					K
 Turn ignitio Disconnect Check the tor. 	n switch OFF ECM harnes continuity bet	s connector. ween refrige	rant pressure		s connector and ECM harness connec-	L
Refrigerant pres			CM To available	Continuity		
Connector	Terminal	Connector	Terminal	Eviated		Ν
E219	1 n result norm:	F13	18	Existed		
Is the inspection result normal? YES >> Check sensor power supply 2 circuit. Refer to EC-569, "Diagnosis Procedure". 0 NO >> Repair or replace error-detected parts. 0 3.CHECK REFRIGERANT PRESSURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT 0						
 Turn ignition switch OFF. Disconnect ECM harness connector. Check the continuity between refrigerant pressure sensor harness connector and ECM harness connector. 						

REFRIGERANT PRESSURE SENSOR

REFRIGERANT PRESSURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

Refrigerant pressure sensor		E	Continuity	
Connector	Terminal	Connector	Terminal	Continuity
E219	3	F13	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	CM	Continuity
Connector	Terminal	Connector	Terminal	Continuity
E219	2	F13	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>HAC-107, "Removal and Installation"</u>.

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
- Battery current sensor

NOTE:

If sensor power supply 1 circuit is malfunctioning, DTC P0643 is displayed.

Sensor power supply 2

- Accelerator pedal position (APP) sensor 2
- Camshaft position (CMP) sensor (PHASE)
- Engine oil pressure (EOP) sensor
- Refrigerant pressure sensor

Diagnosis Procedure

1.CHECK SENSOR POWER SUPPLY 2

- 1. Turn ignition switch OFF.
- Disconnect ECM harness connectors 2.
- 3. Turn ignition switch ON.
- 4. Check the voltage between ECM harness connector and ground.

	+		
E	СМ		Voltage (Approx.)
Connector	Terminal		()
E10	142		
F13	18	Ground	5 V
F14	92		
Is the inspectio	n 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.

ECM		Sensor			
Connector	Terminal Name		Connector	Terminal	
E10	142	APP sensor 2	E40	5	
F13	18	Refrigerant pressure sensor	E219	1	
FIJ	10	EOP sensor	F80	3	
F14	92	CMP sensor (PHASE) (bank 1)	F55	1	
F 14	92	CMP sensor (PHASE) (bank 2)	F60	1	

Is the inspection result normal?



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< DTC/CIRCUIT DIAGNOSIS >

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 <u>EC-513</u>, "Component Inspection".)
- Camshaft position sensor (PHASE) (bank 1) (Refer to EC-334, "Component Inspection".)
- Camshaft position sensor (PHASE) (bank 2) (Refer to <u>EC-334. "Component Inspection"</u>.)
- Engine oil pressure (EOP) sensor (Refer to EC-398, "Component Inspection".)
- Refrigerant pressure sensor (Refer to EC-567, "Diagnosis Procedure".)

Is the inspection result normal?

- YES >> Perform <u>GI-41, "Intermittent Incident"</u>.
- NO >> Replace malfunctioning component.

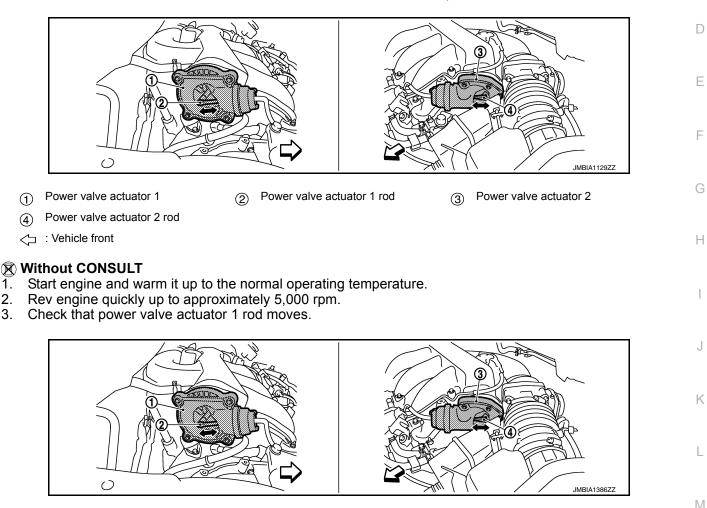
< DTC/CIRCUIT DIAGNOSIS >

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.



- Power valve actuator 1 (\mathbf{f})
- Power valve actuator 2 rod (4)
- C : Vehicle front

1.

2. 3.

Is the inspection result normal?

YES >> GO TO 2.

NO >> EC-572, "Diagnosis Procedure".

2.CHECK OVERALL FUNCTION-II

(P) With CONSULT

Perform "VIAS S/V-2" in "ACTIVE TEST" mode with CONSULT. 1

(2)

Turn VIAS control solenoid valve 2 "ON" and "OFF", and check that power valve actuator 2 rod moves. 2.

Power valve actuator 1 rod

[VQ35DE]

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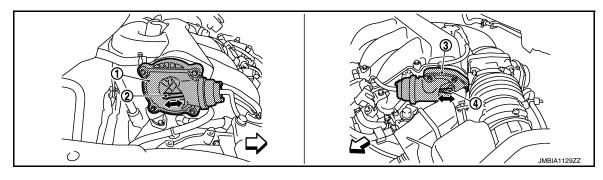
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Power valve actuator 2

3

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]



- (1) Power valve actuator 1
- Power valve actuator 1 rod
- (3) Power valve actuator 2

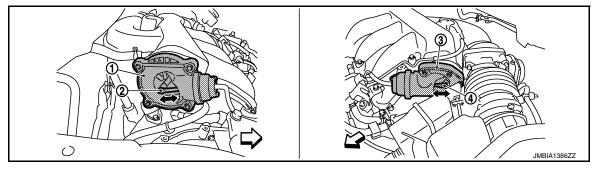
Power valve actuator 2

- (4) Power valve actuator 2 rod

Without CONSULT

- 1. When revving engine up to 5,000 rpm quickly.
- Rev engine quickly up to approximately 5,000 rpm.
- 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
- : Vehicle front

Is the inspection result normal?

YES >> INSPECTION END

NO >> <u>EC-572. "Diagnosis Procedure"</u>.

Diagnosis Procedure

INFOID:000000011940045

1.INSPECTION START

Confirm the malfunctioning system (power valve 1 or power valve 2). Refer to <u>EC-571</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

(I) With CONSULT

1. Stop engine and disconnect vacuum hose connected to power valve actuator 1.

 \bigcirc

- 2. Start engine and let it idle.
- 3. Perform "VIAS S/V-1" in "ACTIVE TEST" mode with CONSULT.
- 4. Turn VIAS control solenoid valve 1 ON and OFF, and check vacuum existence under the following conditions.

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

VIAS S/V-1	Vacuum	—		А
ON	Existed			
OFF	Not existed			EC
 Disconnect VIAS co Start engine. Rev engine quickly 	ntrol solenoid valve up to approximately		lve actuator 1.	С
5. Check vacuum exis	tence under the follo	owing conditions.		D
Conditi	on	Vacuum		
Idle		Existed		E
Rev engine quickly up to ap	proximately 5,000 rpm	Not existed		
Is the inspection result n	ormal?			
YES >> Repair or re ponent Part NO >> GO TO 3.		ctuator 1. Refer to <u>EC-15</u>	. "ENGINE CONTROL SYSTEM : Com-	F
3. CHECK VACUUM TA	NK			G
 Stop engine and dis Start engine and let Check vacuum existence 	it idle. tence from intake m		anifold collector.	Н
YES >> GO TO 4.	ake manifold collecto	or. Refer to <u>EM-27, "Remo</u>	oval and Installation".	I
1. Stop engine.				1
2. Check vacuum hose	er to <u>EC-52, "VARI</u> <u>Description"</u> . lormal?	, improper connection or ABLE INDUCTION AIR	Clogging	K
			Improper connection	M
5. CHECK VIAS CONT	ROL SOLENOID VA	LVE 1	SELIVAL	
Check VIAS control sole Is the inspection result r YES >> GO TO 8. NO >> Replace VIA	enoid valve 1. Refer ormal? AS control solenoid v	to <u>EC-488. "Component I</u> r	nspection". ENGINE CONTROL SYSTEM : Compo-	N
<u>nent Parts L</u> 6.CHECK VACUUM E				E.
 Start engine and let Perform "VIAS S/V-2 	it idle. 2" in "ACTIVE TEST	se connected to power va " mode with CONSULT. and OFF, and check vacu	lve actuator 2. um existence under the following condi-	Р

< 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-15, "ENGINE CONTROL SYSTEM : Component Parts Location"</u>.

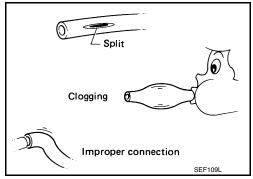
NO >> GO TO 7.

7.CHECK VACUUM HOSE

- 1. Stop engine.
- Check vacuum hose for crack, clogging, improper connection or disconnection. Refer to <u>EC-52</u>, "VARIABLE INDUCTION AIR <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-491</u>, "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 <u>EC-15. "ENGINE CONTROL SYSTEM : Compo-</u> nent Parts Location".

< SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS ENGINE CONTROL SYSTEM SYMPTOMS

Symptom Table

SYSTEM — BASIC ENGINE CONTROL SYSTEM

		SYMPTOM										С				
						z					HIGH				-	
				3/FLAT SPOT	VATION	DR ACCELERATION		(1)) IDLE	OVERHEATS/WATER TEMPERATURE HI	EXCESSIVE FUEL CONSUMPTION	OIL CONSUMPTION	ER CHARGE)	Reference	D
		START/RESTART	ALL	HESITATION/SURGING/FLAT	SPARK KNOCK/DETONATION	POWER/POOR	LOW IDLE	ROUGH IDLE/HUNTING	RATION	SLOW/NO RETURN TO IDLE	S/WATER T	E FUEL CON	E OIL CONS	BATTERY DEAD (UNDER	page	F
		HARD/NO S	ENGINE STALL	HESITATIOI	SPARK KNO	LACK OF P	HIGH IDLE/LOW IDLE	Rough Idi	IDLING VIBRATION	SLOW/NO F	OVERHEAT	EXCESSIVE	EXCESSIVE	BATTERY D		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	EC-553	
	Fuel pressure regulator system	3	3	4	4	4	4	4	4	4		4			EC-168	
	Fuel injector circuit	1	1	2	3	2		2	2			2			<u>EC-550</u>	
	Evaporative emission system	3	3	4	4	4	4	4	4	4		4			<u>EC-46</u>	
Air	Positive crankcase ventilation sys- tem	3	3	4	4	4	4	4	4	4		4	1		<u>EC-31</u>	J
	Incorrect idle speed adjustment						1	1	1	1		1			<u>EC-164</u>	K
	Electric throttle control actuator	1	1	2	3	3	2	2	2	2		2		2	<u>EC-504,</u> <u>EC-509</u>	
Ignition	Incorrect ignition timing adjustment	3	3	1	1	1		1	1			1			<u>EC-164</u>	L
	Ignition circuit	1	1	2	2	2		2	2			2			<u>EC-555</u>	
Power s	supply and ground circuit	2	2	3	3	3		3	3		2	3			<u>EC-190</u>	
Mass ai	r flow sensor circuit	1			2										<u>EC-221,</u> <u>EC-226</u>	M
Engine	coolant temperature sensor circuit						3			3					<u>EC-238,</u> <u>EC-244</u>	N
Air fuel	ratio (A/F) sensor 1 circuit		1	2	3	2		2	2			2			EC-252, EC-256, EC-259, EC-282, EC-497	0
Throttle	position sensor circuit						2	+		2					EC-241, EC-312, EC-440, EC-442, EC-518	Ρ
Accelera	ator pedal position sensor circuit			3	2	1									EC-424, EC-511, EC-514, EC-521	

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< SYMPTOM DIAGNOSIS >

[VQ35DE]

						S١	MPT	ОМ						
	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 symptom code	AA	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	HA	50.000
Knock sensor circuit			2								3			<u>EC-323</u>
Engine oil temperature sensor			4		2						3			<u>EC-306,</u> <u>EC-310</u>
Crankshaft position sensor (POS) circuit	2	2												<u>EC-326</u>
Camshaft position sensor (PHASE) circuit	3	2												<u>EC-330</u>
Vehicle speed signal circuit		2	3		3						3			<u>EC-386</u>
ECM	2	2	3	3	3	3	3	3	3	3	3			<u>EC-411,</u> EC-415
Intake valve timing control solenoid valve cir- cuit		3	2		1	3	2	2	3		3			<u>EC-213</u>
Intake valve timing intermediate lock control solenoid valve circuit														<u>EC-404</u>
Exhaust valve timing control solenoid valve		3	2		1	3	2	2	3		3			<u>EC-218</u>
PNP signal circuit			3		3		3	3			3			<u>EC-427</u>
VIAS control solenoid valve 1 circuit					1									<u>EC-487</u>
VIAS control solenoid valve 2 circuit					1									<u>EC-490</u>
Refrigerant pressure sensor circuit		2				3			3		4			<u>EC-567</u>
Electrical load signal circuit							3							<u>EC-545</u>
Air conditioner circuit	2	2	3	3	3	3	3	3	3		3		2	<u>HAC-43</u>
ABS actuator and electric unit (control unit)			4											<u>BRC-60,</u> <u>BRC-243</u>

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

(continued on next page)

SYSTEM — ENGINE MECHANICAL & OTHER

< SYMPTOM DIAGNOSIS >

[VQ35DE]

			SYMPTOM								А					
		START/RESTART (EXCP. HA)				RATION					IRE HIGH			(;		EC
				HESITATION/SURGING/FLAT SPOT	ONATION	LACK OF POWER/POOR ACCELERATION	щ	NG		TO IDLE	OVERHEATS/WATER TEMPERATURE	EXCESSIVE FUEL CONSUMPTION	NSUMPTION	BATTERY DEAD (UNDER CHARGE)	Reference page	С
			ENGINE STALL	ATION/SURGI	SPARK KNOCK/DETONATION	OF POWER/P	HIGH IDLE/LOW IDLE	ROUGH IDLE/HUNTING	IDLING VIBRATION	SLOW/NO RETURN TO IDLE	HEATS/WATE	SSIVE FUEL C	EXCESSIVE OIL CONSUMPTION	ERY DEAD (UN	pago	D
		HARD/NO	ENGI	HESI	SPAR	LACK	HIGH	ROUC	IDLIN	SLOW	OVEF	EXCE	EXCE	BATTI		
Warranty s	symptom code	AA	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	HA		F
Fuel	Fuel tank	5													<u>FL-4</u>	
	Fuel piping	5		5	5	5		5	5			5			<u>ru-4</u>	
	Vapor lock		5												—	G
	Valve deposit														_	
	Poor fuel (Heavy weight gasoline, Low octane)	5		5	5	5		5	5			5			_	Н
Air	Air duct														<u>EM-26</u>	
	Air cleaner							5							<u>EM-26</u>	
	Air leakage from air duct (Mass air flow sensor — electric throttle control actuator)		5	5		5			5			5			<u>EM-26</u>	I
	Electric throttle control actuator	5			5		5			5					<u>EM-27</u>	J
	Air leakage from intake manifold/ Collector/Gasket	-													<u>EM-27,</u> <u>EM-30</u>	K
Cranking	Battery														<u>PG-92</u>	
															<u>CHG-13</u> (With EXP- 800 NI or GR8-1200	L
	Generator circuit	1	1	1		1		1	1			1		1	NI)*, <u>CHG-</u> <u>16</u> (Without EXP-800 NI or GR8- 1200 NI)*	М
	Starter circuit	3													<u>STR-10</u> (With GR8- 1200 NI)*, <u>STR-14</u> (Without GR8-1200 NI)*	N O
	Signal plate	6													<u>EM-126</u>	Ρ
	PNP signal	4													<u>EC-427</u>	

< 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	
Engine	Cylinder head	F	F	F	F	F		F	F			F			EM 07
	Cylinder head gasket	5	5	5	5	5		5	5		4	5	3		<u>EM-97</u>
	Cylinder block														
	Piston												4		
	Piston ring	6	6	6	6	6		6	6			6			<u>EM-126</u>
	Connecting rod	Ŭ	U	U	U	U		Ū				0			
	Bearing														
	Crankshaft														
Valve mecha-	Timing chain														<u>EM-66</u>
nism	Camshaft														<u>EM-86</u>
	Intake valve timing control	5	5	5	5	5		5	5			5			<u>EM-55</u> , <u>EM-56</u>
	Exhaust valve timing control														<u>EM-55,</u> <u>EM-56</u>
	Intake valve												3		<u>EM-97</u>
	Exhaust valve														
Exhaust	Exhaust manifold/Tube/Muffler/ Gasket	5	5	5	5	5		5	5			5			<u>EM-32,</u> <u>EM-34</u> , <u>EX-</u>
	Three way catalyst														<u>4</u>
Lubrica- tion	Oil pan/Oil strainer/Oil pump/Oil filter/Oil gallery/Oil cooler	5	5	5	5	5		5	5			5			<u>EM-39,</u> <u>EM-40, LU-</u> <u>12, LU-15,</u> <u>LU-6</u>
	Oil level (Low)/Filthy oil														<u>LU-8</u>
Cooling	Radiator/Hose/Radiator filler cap														<u>CO-15,</u> <u>CO-10</u>
	Thermostat									5					<u>CO-23</u>
	Water pump	5	5	5	5	5		5	5		4	E			<u>CO-18</u>
	Water gallery	Э	Э	Э	Э	Э		Э	Э		4	5			<u>CO-8</u>
	Cooling fan														<u>CO-16</u>
	Coolant level (Low)/Contaminat- ed coolant								5					<u>CO-10</u>	
NVIS (NIS: NATS)	SAN Vehicle Immobilizer System —	1	1												<u>SEC-51</u>

< SYMPTOM DIAGNOSIS >

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

*: For the details of the EXP-800 NI or GR8-1200 NI, refer to STR-3, "Special Service Tool".

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NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

NORMAL OPERATING CONDITION

Description

INFOID:000000011940047

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-37</u>. <u>"MULTIPORT FUEL INJECTION SYSTEM : System Description"</u>.

< PERIODIC MAINTENANCE > 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

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[VQ35DE]

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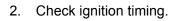
< PERIODIC MAINTENANCE >

IGNITION TIMING

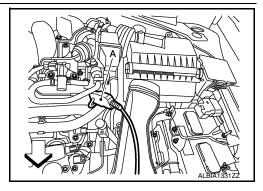
Work Procedure

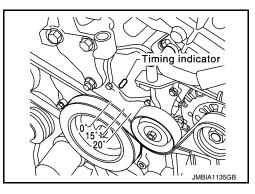
1. CHECK IGNITION TIMING

- 1. Attach timing light to loop wires as shown.
 - (A) : Timing light



>> INSPECTION END







INFOID:000000011940049

EVAP LEAK CHECK

< PERIODIC MAINTENANCE >

EVAP LEAK CHECK

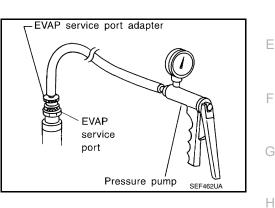
Work Procedure

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

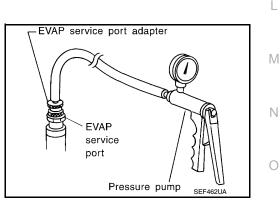
- 1. To locate the EVAP leakage, install EVAP service port adapter (commercial service tool) and pressure pump to EVAP service port.
- 2. Turn ignition switch ON.
- Select the "EVAP SYSTEM CLOSE" of "WORK SUPPORT MODE" with CONSULT.
- 4. Touch "START". A bar graph (Pressure indicating display) will appear on the screen.
- 5. Apply positive pressure to the EVAP system until the pressure indicator reaches the middle of the bar graph.
- 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-46</u>, "EVAPORATIVE EMISSION SYS-<u>TEM : System Description</u>".



Leak detector

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.





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INFOID:000000011940050

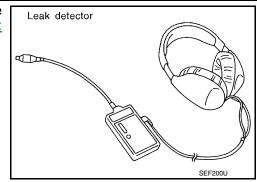
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EVAP LEAK CHECK

< PERIODIC MAINTENANCE >

 Locate the leakage using a leak detector (commercial service tool). Refer to <u>EC-46</u>, "EVAPORATIVE EMISSION SYSTEM : <u>System Description</u>".



[VQ35DE]

< PERIODIC MAINTENANCE >

POSITIVE CRANKCASE VENTILATION

Work Procedure

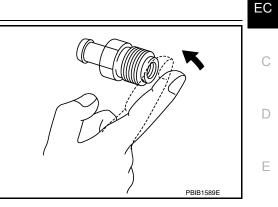
1. CHECK PCV VALVE

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.

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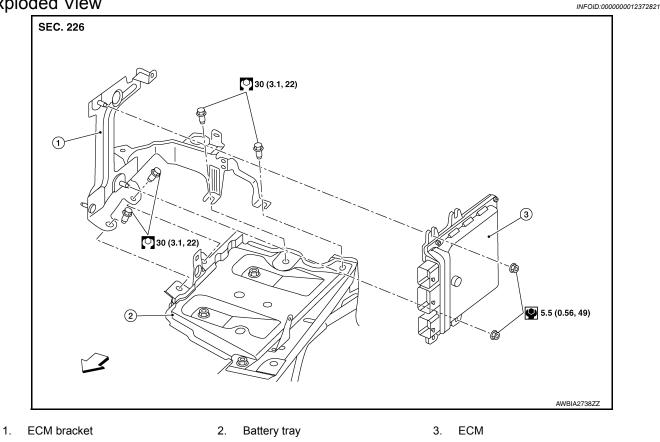
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[VQ35DE]

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REMOVAL AND INSTALLATION ECM

Exploded View

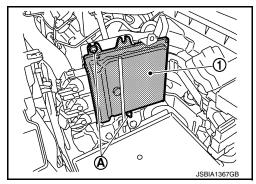


⟨⊐ Front

Removal and Installation

REMOVAL

- 1. Remove front air duct. Refer to EM-26, "Removal and Installation".
- 2. Remove battery. Refer to PG-101, "Removal and Installation (Battery)".
- 3. Disconnect the harness connectors from the ECM. Refer to PG-9, "Harness Connector".
- 4. Remove ECM nuts (A), and then remove ECM (1).



INSTALLATION Installation is in the reverse order of removal. CAUTION: Perform ADDITIONAL SERVICE WHEN REPLACING ECM. Refer to EC-156, "Description".

EC-586

INFOID:000000011940052

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At idle	15 – 40 %
At 2,500 rpm	15 – 40 %
lass Air Flow Sensor	INFCID:000000011940058

		K
Supply voltage	Approx. 5 V	
Output frequency at idle (in N position)	3,900 – 4,500 Hz*	
Mass air flow (Using CONSULT or GST)	2.1 – 5.7 g/s at idle* 7.5 – 21.5 g/s at 2,500 rpm*	

*: Engine is warmed up to normal operating temperature and running under no load.

Ignition Timing	INFOID:000000011940056					
Condition	Specification					
No load* (in P or N position)	$10 \pm 2^{\circ} BTDC$					
*: 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:000000011940057					
Condition	Specification (Using CONSULT or GST)					
At idle	15 – 40 %					
At 2,500 rpm	15 – 40 %					

No load* (in P or N position) *: Under the following conditions

• Electric load: OFF (Lights, heater fan & rear window defogger)

Condition

· Steering wheel: Kept in straight-ahead position

· A/C switch: OFF

Idle Speed

Ignition Timina

< SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS) SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS) [VQ35DE]

Specification

 $650\pm50 \text{ rpm}$

INFOID:000000011940055

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