

PRECAUTIONS

< PRECAUTION >

PRECAUTION

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Precautions for Removing Battery Terminal

INFOID:000000010769758

- When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.

NOTE:

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

- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.

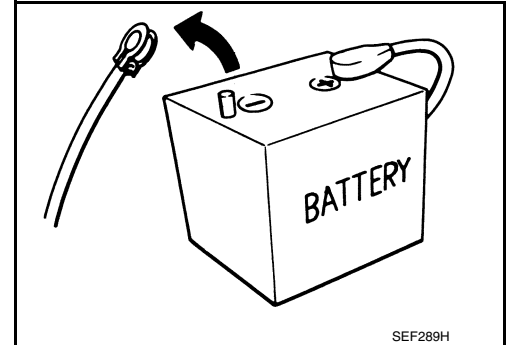
NOTE:

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

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

NOTE:

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



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

INFOID:000000010769759

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

WARNING:

Always observe the following items for preventing accidental activation.

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see "SRS AIR BAG".
- Never use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

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

WARNING:

Always observe the following items for preventing accidental activation.

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

INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

INSPECTION AND ADJUSTMENT

ADDITIONAL SERVICE WHEN REMOVING BATTERY NEGATIVE TERMINAL

ADDITIONAL SERVICE WHEN REMOVING BATTERY NEGATIVE TERMINAL : Description

INFOID:000000010577331

Each function is reset to the following condition when the battery terminal is disconnected. Refer to [ADP-8, "ADDITIONAL SERVICE WHEN REMOVING BATTERY NEGATIVE TERMINAL : Special Repair Requirement"](#).

Function	Condition	Procedure
Memory (Seat, steering, mirror)	Erased	Perform storing
Entry/exit assist	OFF	Perform initialization
		Set slide amount* ¹
Intelligent Key interlock	Erased	Perform storing
Seat synchronization	OFF	—

*1: Default value is 40mm.

NOTE:

Notice that disconnecting the battery when detected DTC are present will erase the DTC memory.

ADDITIONAL SERVICE WHEN REMOVING BATTERY NEGATIVE TERMINAL : Special Repair Requirement

INFOID:000000010577332

1.SYSTEM INITIALIZATION

Perform system initialization. Refer to [ADP-9, "SYSTEM INITIALIZATION : Description"](#).

>> GO TO 2.

2.SYSTEM SETTING

Perform system setting. Refer to [ADP-11, "SYSTEM SETTING : Description"](#).

>> GO TO 3.

3.MEMORY STORAGE

Perform memory storage. Refer to [ADP-10, "MEMORY STORING : Description"](#).

>> END

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT : Description

INFOID:000000010577333

Each function is reset to the following condition when the driver seat control unit is replaced. Refer to [ADP-9, "ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT : Special Repair Requirement"](#).

Function	Condition	Procedure
Memory (Seat, steering, mirror)	Erased	Perform storing
Entry/exit assist	OFF	Perform initialization
		Set slide amount* ¹
Intelligent Key interlock	Erased	Perform storing
Seat synchronization	OFF	—

*1: Default value is 40mm.

NOTE:

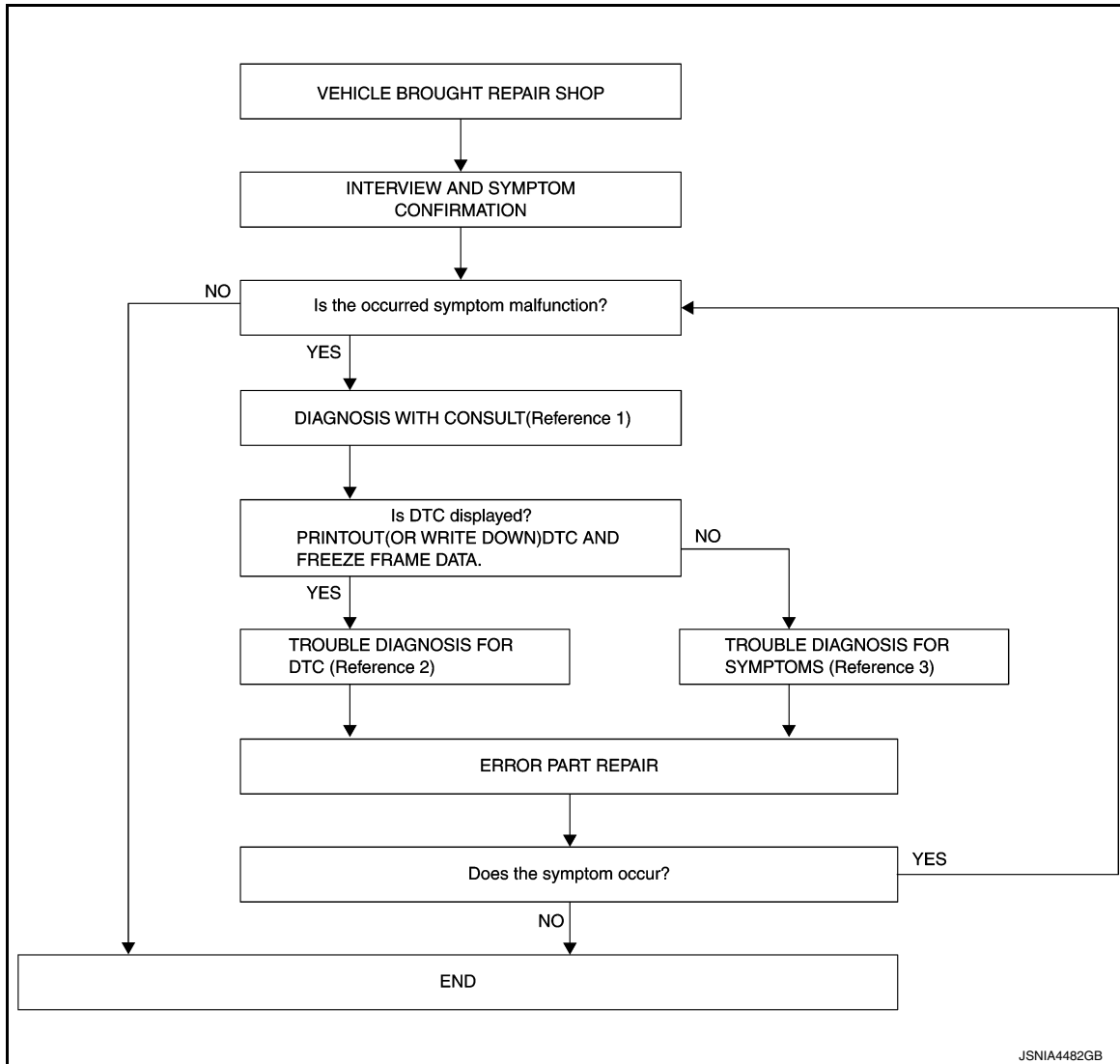
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:000000010578418

OVERALL SEQUENCE



- Reference 1… Refer to [AV-27. "CONSULT Function \(MULTI AV\)".](#)
- Reference 2… Refer to [AV-39. "DTC Index".](#)
- Reference 3… Refer to [AV-123. "Symptom Table".](#)

DETAILED FLOW

1. INTERVIEW AND SYMPTOM CONFIRMATION

Check the malfunction symptoms by performing the following items.

- Interview the customer to obtain the malfunction information (conditions and environment when the malfunction occurred).
- Check the symptom.

Is the occurred symptom malfunction?

YES >> GO TO 2.

NO >> INSPECTION END

2. DIAGNOSIS WITH CONSULT

ACCELERATOR PEDAL ACTUATOR

< ECU DIAGNOSIS INFORMATION >

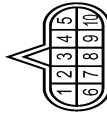
[DCA]

DISTANCE CONTROL ASSIST

Connector No.	F51
Connector Name	A/T ASSEMBLY
Connector Type	IRK10FG-DGY



Terminal No.	Color Of Wire	Signal Name [Specification]
1	Y	IGNITION POWER SUPPLY
2	R	BATTERY POWER SUPPLY/MEMORY BACK-UP
3	L	CANH
4	V	KL LINE
5	B	GROUND
6	Y	IGNITION POWER SUPPLY
7	R	BACK-UP LAMP RELAY
8	P	CANL
9	GR	STARTER RELAY (with V6 engine)
9	LG	STARTER RELAY (with V6 engine)
10	B	GROUND



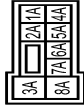
Connector No.	F151
Connector Name	TOM
Connector Type	SP10FG



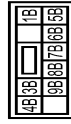
Terminal No.	Color Of Wire	Signal Name [Specification]
1	W	IGNITION POWER SUPPLY
2	B	BATTERY POWER SUPPLY/MEMORY BACK-UP
3	R	CANH
4	O	KL LINE
5	G	GROUND
6	GR	IGNITION POWER SUPPLY
7	L	BACK-UP LAMP RELAY
8	BR	CANL
9	Y	STARTER RELAY

10	WB	GROUND
----	----	--------

Connector No.	M1
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS06FM-AIZ



Terminal No.	Color Of Wire	Signal Name [Specification]
1A	BG	-
2A	G	-
3A	L	-
4A	R	-
5A	V	-
6A	Y	-
7A	R	-
8A	L	-



Connector No.	M2
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS10FM-CS



Terminal No.	Color Of Wire	Signal Name [Specification]
1B	LG	-
3B	P	-
4B	G	-
5B	BG	-
6B	Y	-
7B	L	-
8B	R	-
9B	BR	-

Connector No.	M6
Connector Name	WIRE TO WIRE
Connector Type	TH80MW-CS16-TM4



Terminal No.	Color Of Wire	Signal Name [Specification]
1	G	-
2	BG	-
3	LG	- [Without Auto aircon seat]
3	SB	- [With Auto aircon seat]
4	LG	-
5	BR	-
5	SB	-
6	GR	-
6	W	-
7	G	-
8	W	-
9	P	-
10	BR	-
11	B	-
12	G	-
13	R	-
14	W	-
15	SHIELD	-
16	BR	-
17	L	-
18	P	-
19	G	-
20	GR	- [Without ICC]
20	W	- [With ICC]
21	BR	- [Without ICC]
21	R	- [With ICC]
22	L	- [Without ICC]
22	L	- [With ICC]
23	G	-
24	L	- [Without ICC]
24	P	- [With ICC]
25	W	- [Without ICC]
25	Y	- [With ICC]
26	SHIELD	-
28	GR	-
29	V	-
30	BG	-
32	W	-

33	Y	-
34	L	-
37	G	-
38	R	-
39	G	-
41	L	-
42	W	-
43	R	-
44	LG	-
45	GR	-
46	W	-
47	L	-
48	P	-
49	BG	-
50	LG	-
51	SB	-
52	Y	-
53	BG	-
54	BR	-
55	SB	-
59	SB	-
60	SB	-
61	V	-
62	P	-
63	R	-
64	L	-
65	BG	-
69	V	-
70	SHIELD	-
71	BG	-
72	GR	-
73	W	-
74	SB	-
76	V	-
77	V	-
78	Y	-
80	BG	-
81	L	-
82	W	-
83	Y	-
84	L	-
85	P	-
86	BR	-
87	P	-
88	V	-
89	G	-
90	P	-
91	R	-
92	R	-
93	GR	-

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

< DTC/CIRCUIT DIAGNOSIS >

[VQ37VHR FOR USA AND CANADA]

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

Description

INFOID:000000010582591

SYSTEM DESCRIPTION

Sensor	Input Signal to ECM	ECM function	Actuator
Camshaft position sensor (PHASE) Crankshaft position sensor (POS)	Engine speed	Air fuel ratio (A/F) sensor 1 heater control	Air fuel ratio (A/F) sensor 1 heater
Mass air flow sensor	Amount of intake air		

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 at the specified range.

DTC Logic

INFOID:000000010582592

DTC DETECTION LOGIC

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0031	Air fuel ratio (A/F) sensor 1 heater (bank 1) control circuit low	The current amperage in the A/F sensor 1 heater circuit is out of the normal range. (An excessively low voltage signal is sent to ECM through the A/F sensor 1 heater.)	<ul style="list-style-type: none">• Harness or connectors (The A/F sensor 1 heater circuit is open or shorted.)• A/F sensor 1 heater
P0032	Air fuel ratio (A/F) sensor 1 heater (bank 1) control circuit high	The current amperage in the A/F sensor 1 heater circuit is out of the normal range. (An excessively high voltage signal is sent to ECM through the A/F sensor 1 heater.)	<ul style="list-style-type: none">• Harness or connectors (The A/F sensor 1 heater circuit is shorted.)• A/F sensor 1 heater
P0051	Air fuel ratio (A/F) sensor 1 heater (bank 2) control circuit low	The current amperage in the A/F sensor 1 heater circuit is out of the normal range. (An excessively low voltage signal is sent to ECM through the A/F sensor 1 heater.)	<ul style="list-style-type: none">• Harness or connectors (The A/F sensor 1 heater circuit is open or shorted.)• A/F sensor 1 heater
P0052	Air fuel ratio (A/F) sensor 1 heater (bank 2) control circuit high	The current amperage in the A/F sensor 1 heater circuit is out of the normal range. (An excessively high voltage signal is sent to ECM through the A/F sensor 1 heater.)	<ul style="list-style-type: none">• Harness or connectors (The A/F sensor 1 heater circuit is shorted.)• A/F sensor 1 heater

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

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

TESTING CONDITION:

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

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

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

Is 1st trip DTC detected?

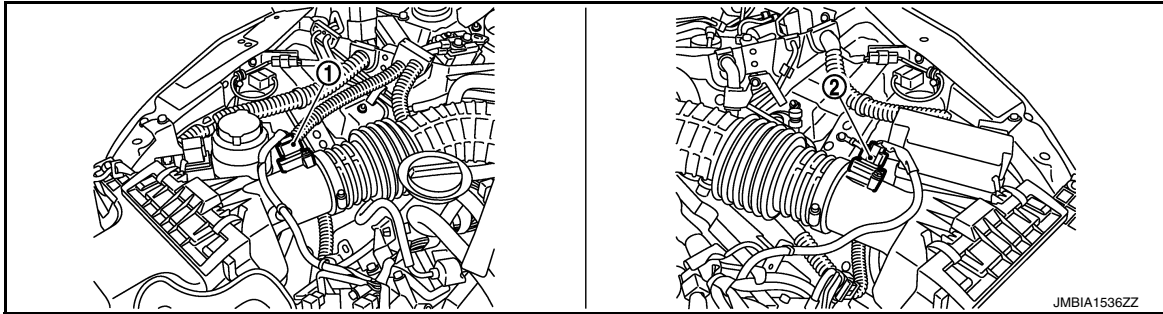
- YES >> Go to [EC-191, "Diagnosis Procedure"](#).
NG >> INSPECTION END

FUEL PUMP CONTROL MODULE

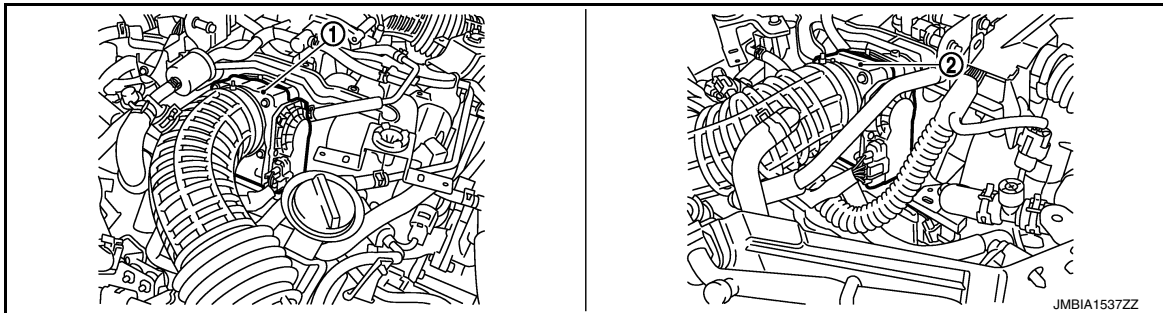
[VK50VE]

< SYSTEM DESCRIPTION >

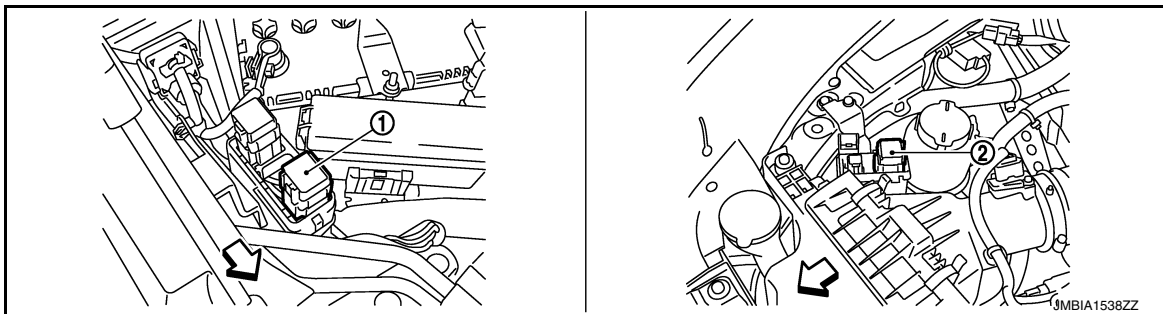
- | | | |
|--|---------------------------------------|---|
| 31. Manifold Absolute Pressure Sensor
(This sensor is not for controlling the engine system, nor for the on board diagnosis.) | 32. Knock sensor (bank 2) | 33. Crankshaft position sensor |
| 34. Electric throttle control actuator (bank2) | 35. VVEL actuator motor (bank 2) | 36. VVEL control shaft position sensor (bank 2) |
| 37. A/F sensor 1 (bank 2) | 38. Engine coolant temperature sensor | 39. Fuel injector (bank 2) |
| 40. Ignition coil (with power transistor) and spark plug (bank 2) | | |



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



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



- | | |
|------------------------|------------------------|
| 1. Cooling fan relay-1 | 2. Cooling fan relay-2 |
|------------------------|------------------------|

← Vehicle front

PRECAUTIONS

< PRECAUTION >

[VQ37VHR]

Always observe the following items for preventing accidental activation.

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

Precautions Necessary for Steering Wheel Rotation After Battery Disconnection

INFOID:000000010581957

CAUTION:

Comply with the following cautions to prevent any error and malfunction.

- Before removing and installing any control units, first turn the ignition switch to the LOCK position, then disconnect both battery cables.
- After finishing work, confirm that all control unit connectors are connected properly, then re-connect both battery cables.
- Always use CONSULT to perform self-diagnosis as a part of each function inspection after finishing work. If a DTC is detected, perform trouble diagnosis according to self-diagnosis results.

For vehicle with steering lock unit, if the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.

If turning the steering wheel is required with the battery disconnected or discharged, follow the operation procedure below before starting the repair operation.

OPERATION PROCEDURE

1. Connect both battery cables.
NOTE:
Supply power using jumper cables if battery is discharged.
2. Turn the ignition switch to ACC position.
(At this time, the steering lock will be released.)
3. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
4. Perform the necessary repair operation.
5. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the ignition switch from ACC position to ON position, then to LOCK position. (The steering wheel will lock when the ignition switch is turned to LOCK position.)
6. Perform self-diagnosis check of all control units using CONSULT.

Precautions For Engine Service

INFOID:000000010581958

DISCONNECTING FUEL PIPING

- Before starting work, check no fire or spark producing items are in the work area.
- Release fuel pressure before disconnecting and disassembly.
- After disconnecting pipes, plug openings to stop fuel leakage.

DRAINING ENGINE COOLANT

Drain engine coolant and engine oil when the engine is cooled.

INSPECTION, REPAIR AND REPLACEMENT

Before repairing or replacing, thoroughly inspect parts. Inspect new replacement parts in the same way, and replace if necessary.

REMOVAL AND DISASSEMBLY

- When instructed to use SST, use specified tools. Always be careful to work safely, avoid forceful or uninstructed operations.
- Exercise maximum care to avoid damage to mating or sliding surfaces.
- Dowel pins are used for several parts alignment. When replacing and reassembling parts with dowel pins, check that dowel pins are installed in the original position.
- Must cover openings of engine system with a tape or equivalent, to seal out foreign materials.

TIMING CHAIN

[VK50VE]

< UNIT DISASSEMBLY AND ASSEMBLY >

1. Check that crankshaft key (1) and dowel pin (A) of each camshaft are located as shown in the figure.

Camshaft dowel pin

: At cylinder head upper face side in each bank

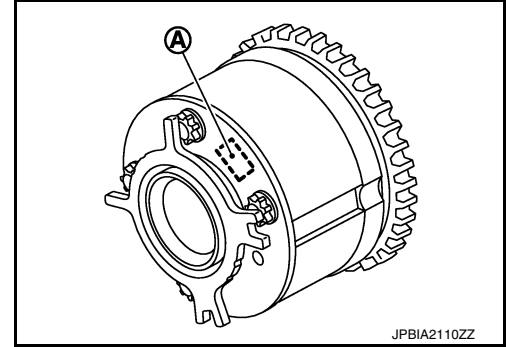
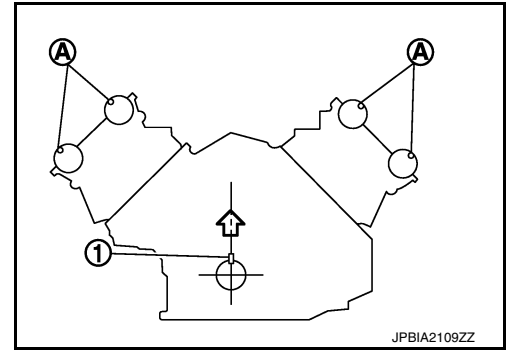
Crankshaft key

: Straight up

NOTE:

Though camshaft does not stop at the position as shown in the figure, for the placement of cam nose, it is generally accepted camshaft is placed for the same direction of the figure.

2. Install camshaft sprockets (INT and EXH).
 - Install onto correct side by checking with identification mark (A) on surface.



Exhaust side:

- Secure the hexagonal portion of camshaft (EXH) using a wrench to tighten mounting bolt. Refer to [EM-238. "Exploded View"](#).

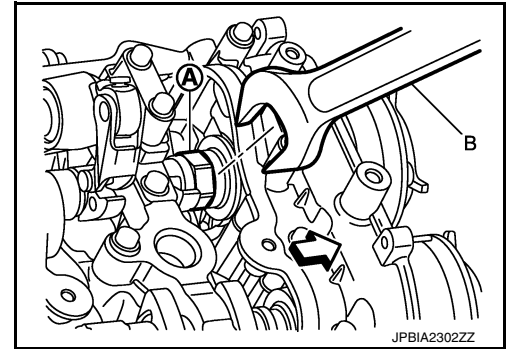
Intake side:

- Secure the hexagonal portion (located in between journal No. 1 and journal No. 2) of drive shaft (A) using a wrench (B) to tighten mounting bolt. Refer to [EM-238. "Exploded View"](#).

⇐ : Engine front

NOTE:

The figure shows an example of bank 2.



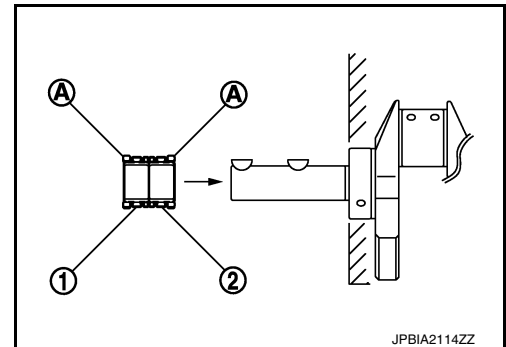
3. Install timing chains as per the following:
 - a. Install crankshaft sprockets for both banks.
 - Install each crankshaft sprocket so that its flange side (the larger diameter side without teeth) (A) faces in the direction shown in the figure.

1 : Crankshaft sprocket (bank 1 side)

2 : Crankshaft sprocket (bank 2 side)

NOTE:

The same parts are used but facing directions are different.



SERVICE INFORMATION FOR ELECTRICAL INCIDENT

< BASIC INSPECTION >

Circuit Inspection

INFOID:000000010580013

DESCRIPTION

- In general, testing electrical circuits is an easy task if it is approached in a logical and organized method. Before beginning it is important to have all available information on the system to be tested. Also, get a thorough understanding of system operation. Then you will be able to use the appropriate equipment and follow the correct test procedure.
- You may have to simulate vehicle vibrations while testing electrical components. Gently shake the wiring harness or electrical component to do this.

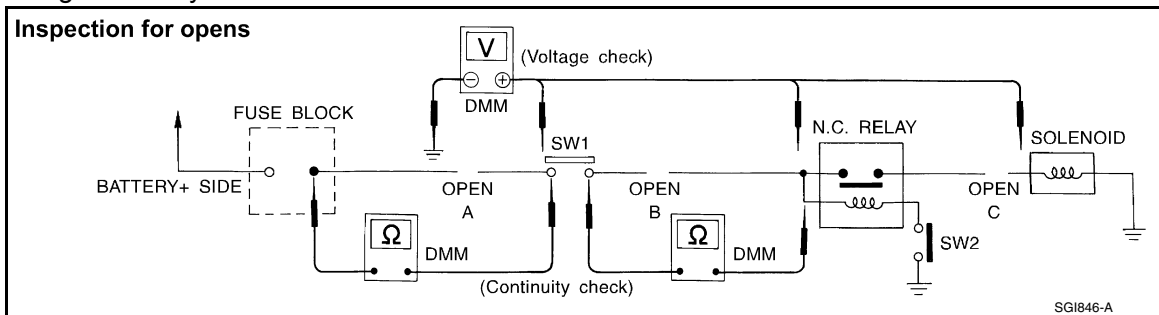
OPEN	A circuit is open when there is no continuity through a section of the circuit.	
SHORT	There are two types of shorts.	
	• SHORT CIRCUIT	When a circuit contacts another circuit and causes the normal resistance to change.
	• SHORT TO GROUND	When a circuit contacts a ground source and grounds the circuit.

NOTE:

Refer to [GI-44, "How to Check Terminal"](#) to probe or check terminal.

TESTING FOR "OPENS" IN THE CIRCUIT

Before you begin to diagnose and test the system, you should rough sketch a schematic of the system. This will help you to logically walk through the diagnosis process. Drawing the sketch will also reinforce your working knowledge of the system.



Continuity Check Method

The continuity check is used to find an open in the circuit. The digital multimeter (DMM) set on the resistance function will indicate an open circuit as over limit (no beep tone or no ohms symbol). Check to always start with the DMM at the highest resistance level.

To help in understanding the diagnosis of open circuits, please refer to the previous schematic.

- Disconnect the battery negative cable.
- Start at one end of the circuit and work your way to the other end. (At the fuse block in this example)
- Connect one probe of the DMM to the fuse block terminal on the load side.
- Connect the other probe to the fuse block (power) side of SW1. Little or no resistance will indicate that portion of the circuit has good continuity. If there were an open in the circuit, the DMM would indicate an over limit or infinite resistance condition. (point A)
- Connect the probes between SW1 and the relay. Little or no resistance will indicate that portion of the circuit has good continuity. If there were an open in the circuit, the DMM would indicate an over limit or infinite resistance condition. (point B)
- Connect the probes between the relay and the solenoid. Little or no resistance will indicate that portion of the circuit has good continuity. If there were an open in the circuit, the DMM would indicate an over limit or infinite resistance condition. (point C)

Any circuit can be diagnosed using the approach in the previous example.

Voltage Check Method

To help in understanding the diagnosis of open circuits please refer to the previous schematic.

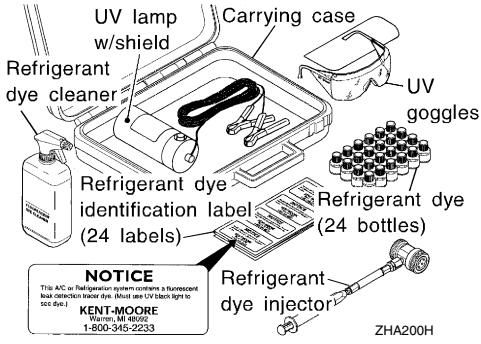
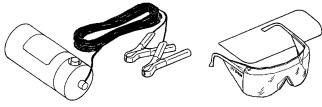

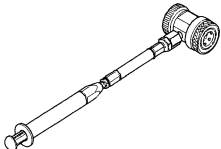

In any powered circuit, an open can be found by methodically checking the system for the presence of voltage. This is done by switching the DMM to the voltage function.

- Connect one probe of the DMM to a known good ground.
- Begin probing at one end of the circuit and work your way to the other end.
- With SW1 open, probe at SW1 to check for voltage.
voltage: open is further down the circuit than SW1.

PREPARATION

< PREPARATION >

[AUTOMATIC AIR CONDITIONER]

Tool number (Kent-Moore No.) Tool name	Description
<p>(J-43926) Refrigerant dye leak detection kit Kit includes: (J-42220) UV lamp and UV safety goggles (J-41459) HFC-134a (R-134a) dye injector Use with J-41447, 1/4 ounce bottle (J-41447) HFC-134a (R-134a) fluorescent leak detection dye (Box of 24, 1/4 ounce bottles) (J-43872) Refrigerant dye cleaner</p>	 <p style="text-align: right;">Power supply: DC 12 V (Battery terminal)</p>
<p>(J-42220) UV lamp and UV safety goggles</p>	 <p style="text-align: right;">Power supply: DC 12 V (Battery terminal) For checking refrigerant leakage when fluorescent dye is equipped in A/C system Includes: UV lamp and UV safety goggles</p>
<p>(J-41447) HFC-134a (R-134a) fluorescent leak detection dye (Box of 24, 1/4 ounce bottles)</p>	 <p style="text-align: right;">Application: For HFC-134a (R-134a) PAG oil Container: 1/4 ounce (7.4 cc) bottle (Includes self-adhesive dye identification labels for affixing to vehicle after charging system with dye.)</p>
<p>(J-41459) HFC-134a (R-134a) dye injector Use with J-41447, 1/4 ounce bottle</p>	 <p style="text-align: right;">For injecting 1/4 ounce of fluorescent leak detection dye into A/C system</p>
<p>(J-43872) Refrigerant dye cleaner</p>	 <p style="text-align: right;">For cleaning dye spills</p>

AFS BRANCH LINE CIRCUIT

Diagnosis Procedure

INFOID:000000011014498

1. CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check the following terminals and connectors for damage, bend and loose connection (unit side and connector side).
 - AFS control unit
 - CAN gateway (VQ37VHR with around view monitor)

Is the inspection result normal?

- YES (VQ37VHR with around view monitor)>>GO TO 2.
 YES (VQ37VHR without around view monitor or VK50VE)>>GO TO 3.
 NO >> Repair the terminal and connector.

2. CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

1. Disconnect the connector of CAN gateway.
2. Check the continuity between the CAN gateway harness connector terminals.

CAN gateway harness connector		Continuity
Connector No.	Terminal No.	
M125	4	6
	10	12
		Existed
		Existed

Is the inspection result normal?

- YES >> GO TO 3.
 NO >> Check the harness and repair the root cause (CAN communication circuit 2 side). Refer to [LAN-64. "System Diagram"](#).

3. CHECK HARNESS FOR OPEN CIRCUIT

1. Connect the connector of CAN gateway.
2. Disconnect the connector of AFS control unit.
3. Check the resistance between the AFS control unit harness connector terminals.

AFS control unit harness connector		Resistance (Ω)
Connector No.	Terminal No.	
M16	30	7
		Approx. 54 – 66

Is the measurement value within the specification?

- YES >> GO TO 4.
 NO >> Repair the AFS control unit branch line.

4. CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the AFS control unit. Refer to [EXL-65. "AFS CONTROL UNIT : Diagnosis Procedure"](#).

Is the inspection result normal?

- YES (Present error)>>Replace the AFS control unit. Refer to [EXL-232. "Exploded View"](#).
 YES (Past error)>>Error was detected in the AFS control unit branch line.
 NO >> Repair the power supply and the ground circuit.

ENGINE MAINTENANCE (VQ37VHR)

< PERIODIC MAINTENANCE >

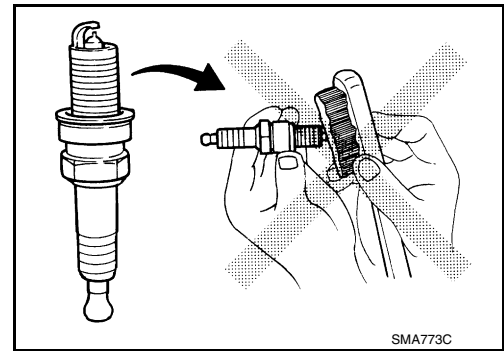
- Never drop or shock spark plug.
- Never use a wire brush for cleaning.
- If plug tip is covered with carbon, use spark plug cleaner to clean.

Cleaner air pressure

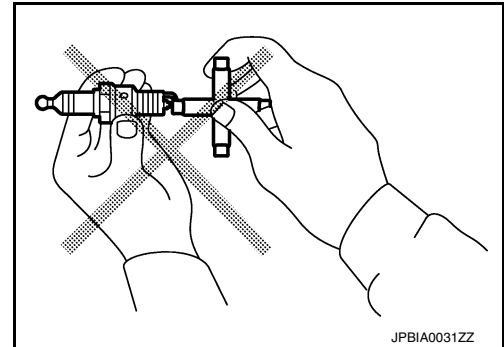
: Less than 588 kPa (5.88 bar, 6 kg/cm², 85 psi)

Cleaning time

: Less than 20 seconds



- Spark plug gap adjustment is not required between replacement intervals.
- Measure spark plug gap. When it exceeds the limit, replace spark plug even if it is within the specified replacement mileage. Refer to [EM-151, "Spark Plug"](#).



EVAP VAPOR LINES

EVAP VAPOR LINES : Inspection

INFOID:000000010577158

1. Visually inspect EVAP vapor lines for improper attachment and for cracks, damage, loose connections, chafing and deterioration. Refer to [EC-628, "Inspection"](#) (For USA and Canada), [EC-1124, "Inspection"](#) (For Mexico).
2. Inspect fuel tank filler cap vacuum relief valve for clogging, sticking, etc. Refer to [EC-355, "Component Inspection"](#) (For USA and Canada).

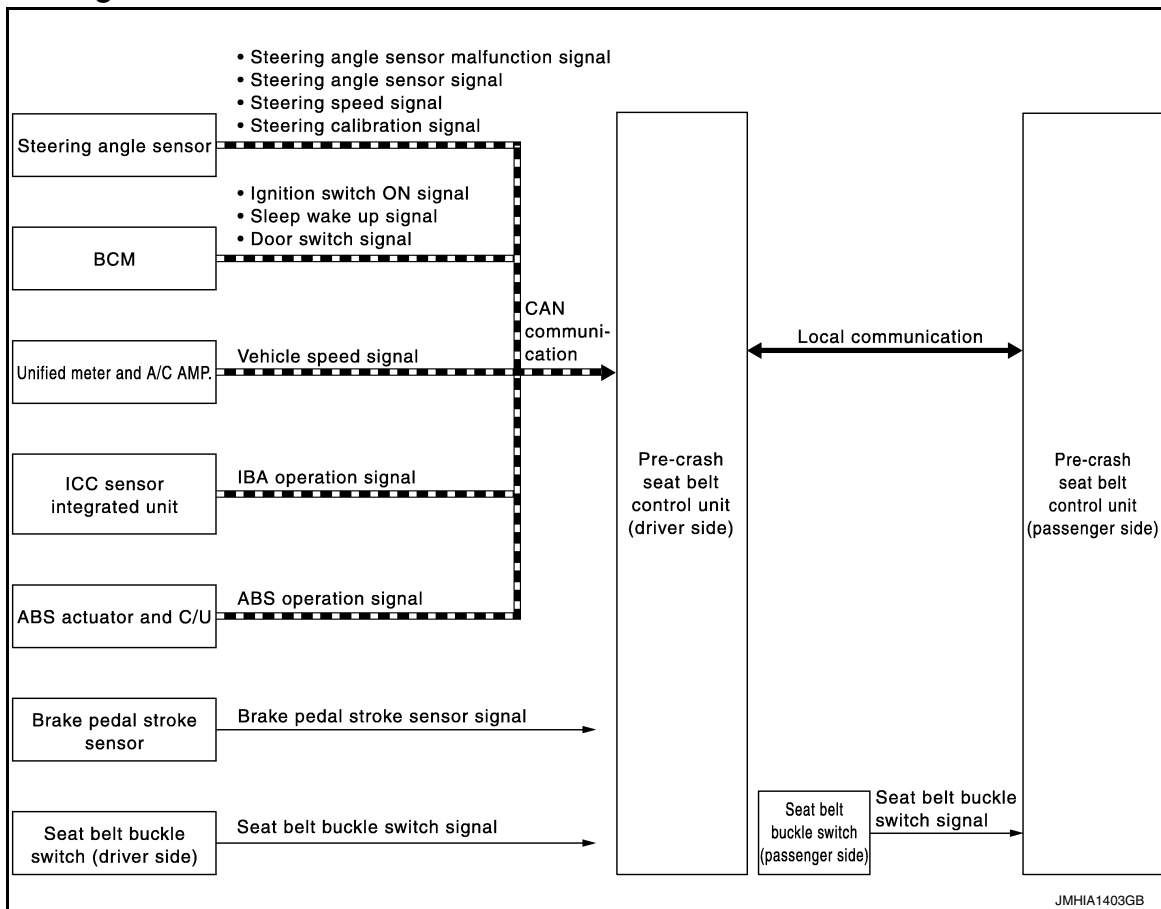
PRE-CRASH SEAT BELT SYSTEM

< SYSTEM DESCRIPTION >

SYSTEM DESCRIPTION

PRE-CRASH SEAT BELT SYSTEM

System Diagram



System Description

INFOID:0000000010580871

- Pre-crash seat belt system (with comfort function) is adopted for driver and passenger seat belts.
- Pre-crash seat belt system integrates control unit and motor in driver and passenger seat belt retractors.
- Provides a sense of ease when pre-crash seat belt control unit judges the emergency braking operation, the intelligent brake assistance operating status, the continuous ABS operating status, the emergency steering wheel operation, or the lateral slippage status during cornering, the motor immediately retracts the seat belt and suppresses change in occupant posture.
- Even in a situation where a collision is unavoidable, effects of other safety devices, like the air bag, are maximized and damages are reduced.
- Motor retracts seat belt when unfastening and extracts seat belt when fastening to reduce the feeling of pressure.(comfort function)

FUNCTION DESCRIPTION

Pre-crash seat belt system operates under the following conditions.

- During emergency brake operation
- When ABS continuously operates
- When intelligent brake assistance operates
- When lateral slippage during cornering occurs
- When steering wheel is rotated for emergency
- When comfort function operates

OPERATION CONDITION

Operation start and stop conditions of pre-crash seat belt system are as shown in the following table.

SHIFT LOCK SYSTEM

< SYSTEM DESCRIPTION >

[7AT: RE7R01A (VQ37VHR)]

SHIFT LOCK SYSTEM

System Description

INFOID:000000010578867

- Shift lock prevents an unintentional start of the vehicle that may be caused by an incorrect operation while selector lever is in the “P” position.
- Selector lever can be shifted from the “P” position to another position when the following conditions are satisfied.
 - Ignition switch ON
 - Stop lamp switch is ON (brake pedal is depressed)
 - Selector lever knob button is pressed

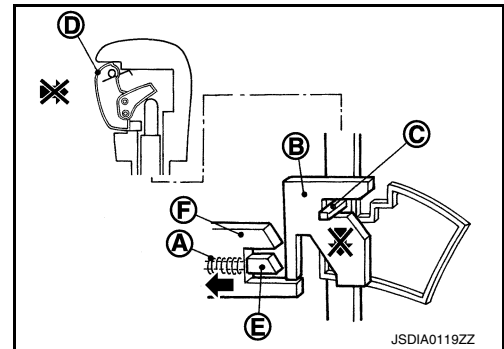
SHIFT LOCK OPERATION AT “P” POSITION

When Brake Pedal Is Not Depressed (No Shift Operation Allowed)

The shift lock solenoid (A) inside the shift lock unit is not energized if the brake pedal is not depressed while the ignition switch is ON.

The lock plate (B) lowers according to the downward movement of the position pin (C) when the selector button (D) is pressed, and presses only slider B (E) into the shift lock unit. Slider A (F) located below the lock plate prevents the downward movement of the lock plate with the spring force. The selector lever cannot be shifted from the “P” position for this reason.

However, slider A is forcibly pressed into the shift lock unit, allowing the selector lever to shift if the shift lock release button is pressed.

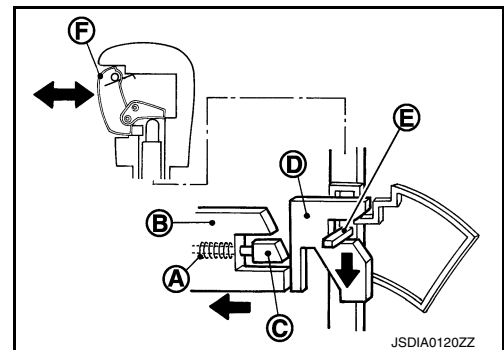


When Brake Pedal Is Depressed (Shift Operation Allowed)

The shift lock solenoid (A) inside the shift lock unit is energized and the relative positions of sliders A (B) and B (C) are maintained when the brake pedal is depressed while the ignition switch is ON.

The lock plate (D) lowers according to the downward movement of the position pin (E), thrusting away sliders A and B, when the selector button (F) is pressed.

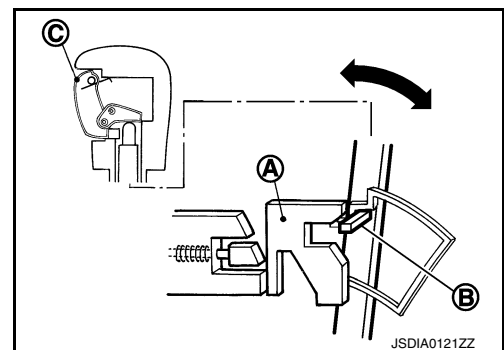
The position pin lowers to the position that allows shift operation for this reason. As a result, the selector lever can be shifted out of the P position.



OPERATION AT OTHER THAN “P” POSITION

The shift lock function will not operate at any position other than “P” because the lock plate (A) is only set for the “P” position. Accordingly, the selector lever can be shifted to any position regardless of the brake operation.

The position pin (B) enters the “P” position thrusting away the lock plate when the selector lever is shifted to the “P” position. Then, the shift mechanism is locked when the selector button (C) is released.



“P” POSITION RETAINING MECHANISM (IGNITION SWITCH LOCK)

When ignition switch is not in the ON position, power is not applied to the shift lock solenoid in the shift lock unit. This causes shift lock state, and then “P” position is retained.

When an actuating system in the shift lock unit has a malfunction, selector lever is unable to operate from the “P” position even when pressing the brake pedal with the ignition switch ON. However, when pressing the shift lock release button, slider A is forcibly pressed into the shift lock unit. This allows shift lock to be released and selector lever enables the select operation from the “P” position.

CAUTION:

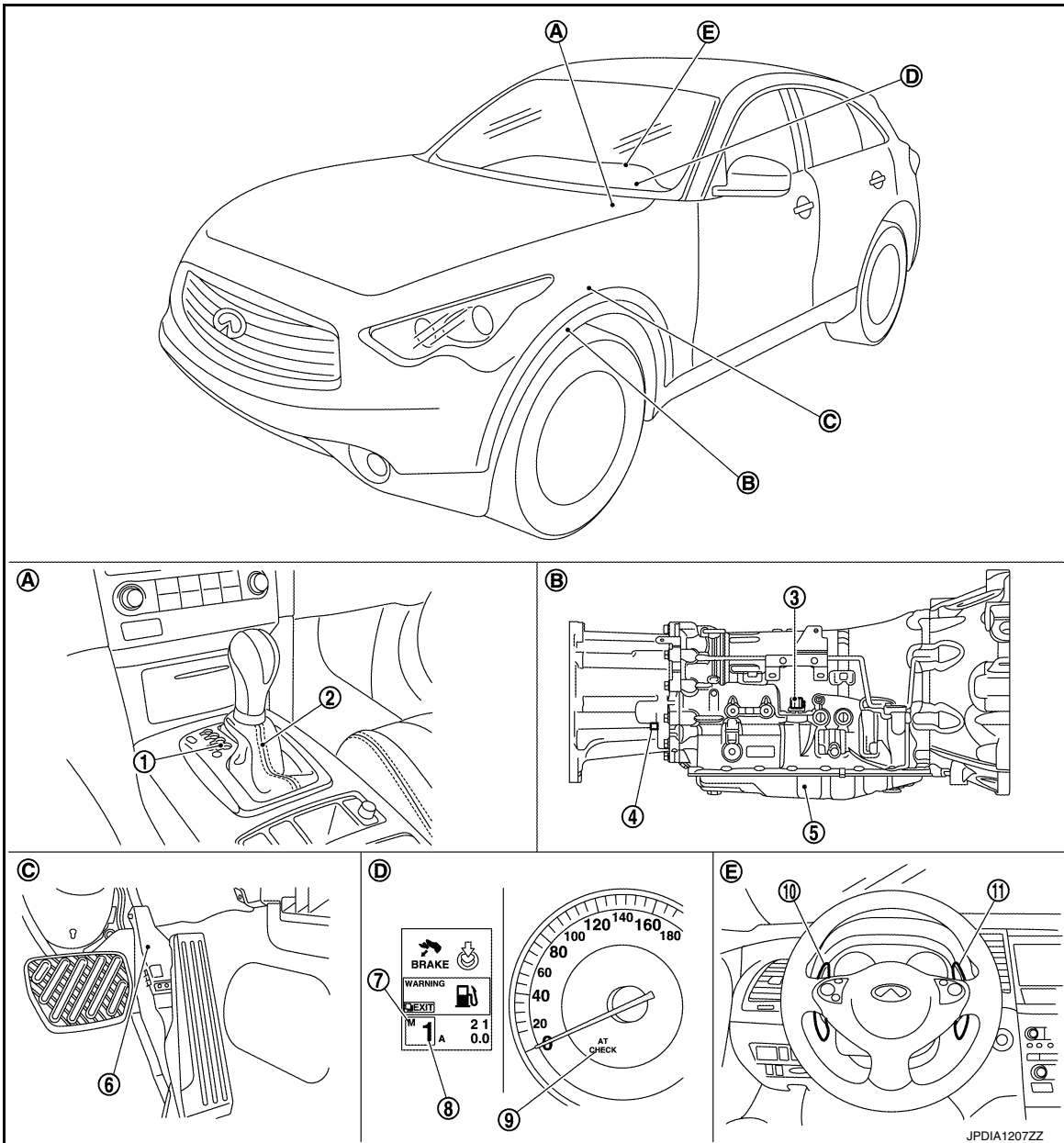
A/T CONTROL SYSTEM

< SYSTEM DESCRIPTION >

[7AT: RE7R01B (VK50VE)]

Component Parts Location

INFOID:0000000110579087



- | | | |
|--------------------------------------|--------------------------------|--------------------------------------|
| 1. Selector lever position indicator | 2. A/T shift selector assembly | 3. Joint connector |
| 4. Control valve & TCM*1 | 5. Output speed sensor | 6. Accelerator pedal position sensor |
| 7. Manual mode indicator | 8. Shift position indicator | 9. A/T CHECK indicator lamp |
| 10. Paddle shifter (shift-down)*2 | Paddle shifter (shift-up)*2 | |
| A. Center console | B. A/T assembly | C. Accelerator pedal |
| D. Combination meter | E. Steering wheel | |

NOTE:

- The following components are included in A/T shift selector assembly.
 - Manual mode select switch
 - Manual mode position select switch
 - Shift position switch
- The following components are included in control valve & TCM.
 - TCM
 - Input speed sensor 1, 2

A
B
C
TM
E
F
G
H
I
J
K
L
M
N
O
P