# SECTION TM
# TRANSAXLE & TRANSMISSION



## CONTENTS

# PRECAUTION

## PRECAUTIONS

### Precaution for Technicians Using Medical Electric

INFOID:0000000010119514

#### OPERATION PROHIBITION

**WARNING:**

- **Parts with strong magnet is used in this vehicle.**
- **Technicians using a medical electric device such as pacemaker must never perform operation on the vehicle, as magnetic field can affect the device function by approaching to such parts.**

#### NORMAL CHARGE PRECAUTION

**WARNING:**

- **If a technician uses a medical electric device such as an implantable cardiac pacemaker or an implantable cardioverter defibrillator, the possible effects on the devices must be checked with the device manufacturer before starting the charge operation.**
- **As radiated electromagnetic wave generated by PDM (Power Delivery Module) at normal charge operation may affect medical electric devices, a technician using a medical electric device such as implantable cardiac pacemaker or an implantable cardioverter defibrillator must not approach motor room [PDM (Power Delivery Module)] at the hood-opened condition during normal charge operation.**

#### PRECAUTION AT TELEMATICS SYSTEM OPERATION

**WARNING:**

- **If a technician uses implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), avoid the device implanted part from approaching within approximately 220 mm (8.66 in) from interior/exterior antenna.**
- **The electromagnetic wave of TCU might affect the function of the implantable cardiac pacemaker or the implantable cardioverter defibrillator (ICD), when using the service, etc.**
- **If a technician uses other medical electric devices than implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), the electromagnetic wave of TCU might affect the function of the device. The possible effects on the devices must be checked with the device manufacturer before TCU use.**

#### PRECAUTION AT INTELLIGENT KEY SYSTEM OPERATION

**WARNING:**

- **If a technician uses implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), avoid the device implanted part from approaching within approximately 220 mm (8.66 in) from interior/exterior antenna.**
- **The electromagnetic wave of Intelligent Key might affect the function of the implantable cardiac pacemaker or the implantable cardioverter defibrillator (ICD), at door operation, at each request switch operation, or at engine starting.**
- **If a technician uses other medical electric devices than implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), the electromagnetic wave of Intelligent Key might affect the function of the device. The possible effects on the devices must be checked with the device manufacturer before Intelligent Key use.**

### Point to Be Checked Before Starting Maintenance Work

INFOID:0000000010119515

**The high voltage system may starts automatically. It is required to check that the timer air conditioner and timer charge (during EVSE connection) are not set before starting maintenance work.**
**NOTE:**
If the timer air conditioner or timer charge (during EVSE connection) is set, the high voltage system starts automatically even when the power switch is in OFF state.

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

INFOID:0000000010119516

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 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, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the 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

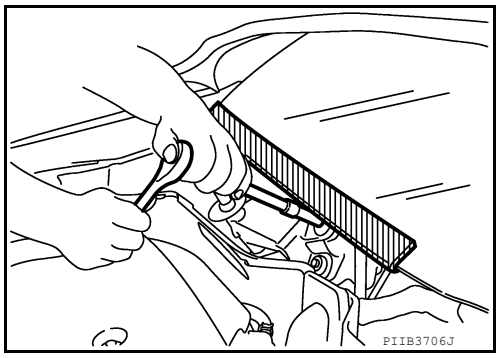
**WARNING:**

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

## Precaution for Procedure without Cowl Top Cover

INFOID:0000000010119517

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc to prevent damage to windshield.




## High Voltage Precautions

INFOID:0000000010119518

**DANGER:**

**Since hybrid vehicles and electric vehicles contain a high voltage battery, there is the risk of electric shock, electric leakage, or similar accidents if the high voltage component and vehicle are handled incorrectly. Be sure to follow the correct work procedures when performing inspection and maintenance.**

**WARNING:**

- **Be sure to remove the service plug in order to disconnect the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.**
- **The removed service plug must always be carried in a pocket of the responsible worker or placed in the tool box during the procedure to prevent the plug from being connected by mistake.**
- **Be sure to wear insulated protective equipment before beginning work on the high voltage system.**
- **Never allow workers other than the responsible person to touch the vehicle containing high voltage parts. To keep others from touching the high voltage parts, these parts must be covered with an insulating sheet except when using them.**

**CAUTION:**

**Never bring the vehicle into the READY status with the service plug removed unless otherwise instructed in the Service Manual. A malfunction may occur if this is not observed.**

HIGH VOLTAGE HARNESS AND EQUIPMENT IDENTIFICATION

All the high voltage harnesses and connectors are orange. The Li-ion battery and other high voltage devices include an orange high voltage label. Never touch these harnesses and high voltage parts.

### HANDLING OF HIGH VOLTAGE HARNESS AND TERMINALS

Immediately insulate disconnected high voltage connectors and terminals with insulating tape.

### REGULATIONS ON WORKERS WITH MEDICAL ELECTRONICS

**WARNING:**

**The vehicle contains parts that contain powerful magnets. If a person who is wearing a heart pacemaker or other medical device is close to these parts, the medical device may be affected by the magnets. Such persons must not perform work on the vehicle.**

### PROHIBITED ITEMS TO CARRY DURING THE WORK

Hybrid vehicles and electric vehicles contain parts with high voltage and intense magnetic force. Never carry metal products and magnetic recording media (e.g. cash card, prepaid card) to repair/inspect high voltage parts. If this is not observed, the metal products may create a risk of short circuit and the magnetic recording media may lose their magnetic recording.

### POSTING A SIGN OF “DANGER! HIGH VOLTAGE AREA. KEEP OUT”

Indicate "HIGH VOLTAGE. DO NOT TOUCH" on the vehicle under repair/inspection to call attention to other workers.



Person in charge:_____
DANGER:
HIGH VOLTAGE
REPAIR IN PROGRESS.
DO NOT TOUCH!

**DANGER:**
**HIGH VOLTAGE**
**REPAIR IN PROGRESS.**
**DO NOT TOUCH!**

**Person in charge:_____**

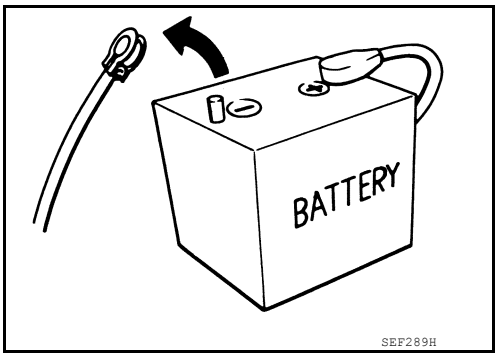
**Copy this page and put it after folding on the roof of the vehicle in service.**

JSAIA1600GB

## Precautions for Removing Battery Terminal

INFOID:0000000010119519

- When removing the 12V battery terminal, turn OFF the power switch and wait at least 5 minutes.
  **NOTE:**
  ECU may be active for several minutes after the power switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.
- Always disconnect the battery terminal within 60 minutes after turning OFF the power switch. Even when the power switch is OFF, the 12V battery automatic charge control may automatically start after a lapse of 60 minutes from power switch OFF.
- Disconnect 12V battery terminal according to the following steps.




### WORK PROCEDURE

1. Check that EVSE is not connected.
   **NOTE:**
   If EVSE is connected, the air conditioning system may be automatically activated by the timer A/C function.
2. Turn the power switch OFF → ON → OFF. Get out of the vehicle. Close all doors (including back door).
3. Check that the charge status indicator lamp does not blink and wait for 5 minutes or more.
   **NOTE:**
   If the battery is removed within 5 minutes after the power switch is turned OFF, plural DTCs may be detected.
4. Remove 12V battery terminal within 60 minutes after turning the power switch OFF → ON → OFF.
   **CAUTION:**
   - **After all doors (including back door) are closed, if a door (including back door) is opened before battery terminals are disconnected, start over from Step 1.**
   - **After turning the power switch OFF, if "Remote A/C" is activated by user operation, stop the air conditioner and start over from Step 1.**

   **NOTE:**
   Once the power switch is turned ON → OFF, the 12V battery automatic charge control does not start for approximately 1 hour.

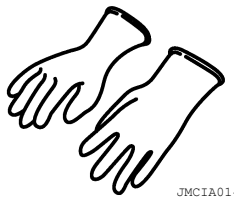
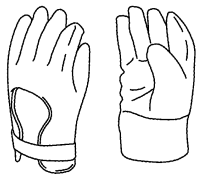
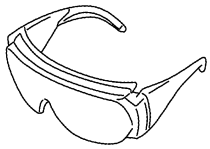
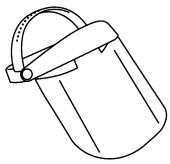
- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the power switch.
  **NOTE:**
  If the power switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.
- After installing the 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.

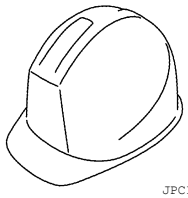
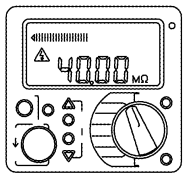
# PREPARATION

## PREPARATION

### Commercial Service Tools

INFOID:0000000010119520

| Tool name | Description |
|---|---|
| Insulated gloves  JMCIA0149ZZ | Removing and installing high voltage components [Guaranteed insulation performance for 1000V/300A] |
| Leather gloves  JPCIA0066ZZ | • Removing and installing high voltage components<br>• Protect insulated gloves<br>[Use leather gloves that can fasten the wrist tight] |
| Insulated safety shoes  JPCIA0011ZZ | Removing and installing high voltage components |
| Safety glasses  JPCIA0012ZZ | • Removing and installing high voltage components<br>• To protect eye from the spatter on the work to electric line<br>[ANSI Z87.1] |
| Face shield  JPCIA0167ZZ | • Removing and installing high voltage components<br>• To protect face from the spatter on the work to electric line |

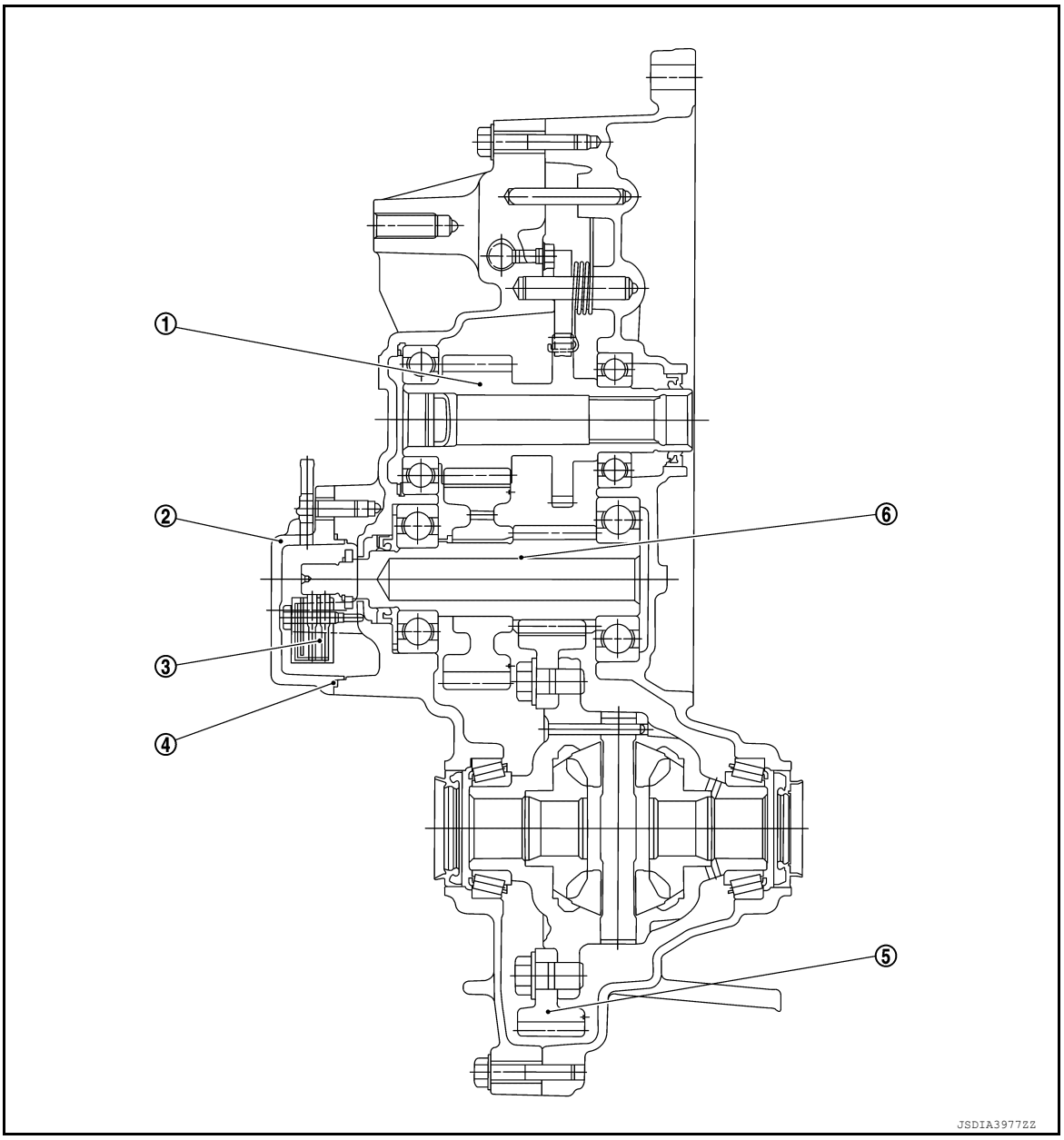
| Tool name | Description |
|---|---|
| Insulated helmet  JPCIA0013ZZ | Removing and installing high voltage components |
| Insulation resistance tester (Multi tester)  JPCIA0014ZZ | Measuring insulation resistance, voltage, and resistance |

# SYSTEM DESCRIPTION

## STRUCTURE AND OPERATION

### Sectional View

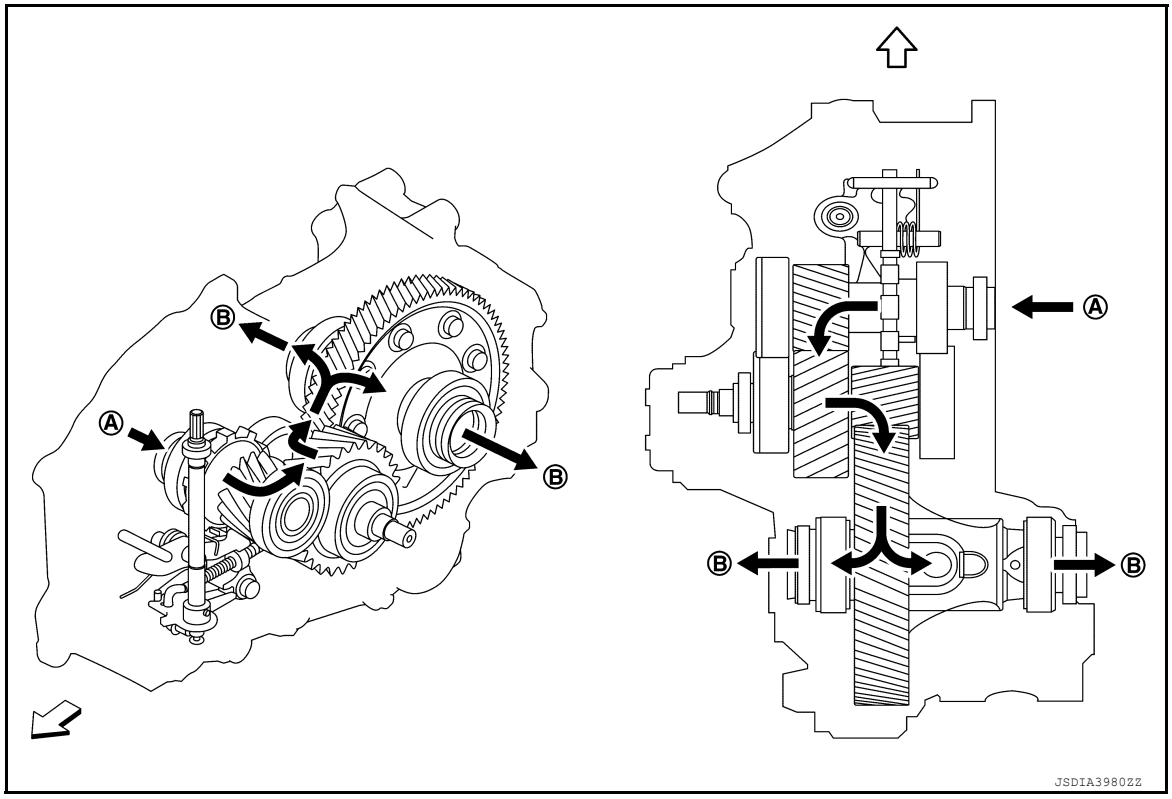
INFOID:0000000010119521




① Input gear
② Brush cover
③ Earth brush
④ O-ring
⑤ Final gear
⑥ Main shaft

## Power Transfer Diagram

INFOID:0000000010119522




Ⓐ From traction motor

Ⓑ To drive shaft

⇦ : Vehicle front

⬅ : Power flow

# PERIODIC MAINTENANCE

## REDUCTION GEAR OIL

### Inspection

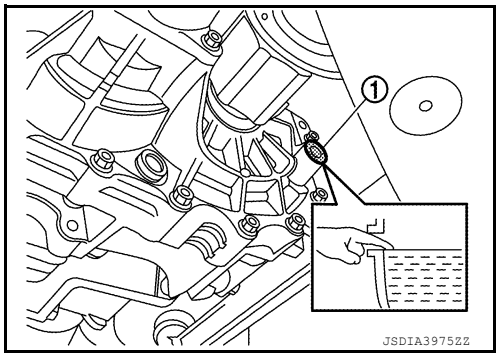
INFOID:0000000010119523

#### OIL LEAKAGE

Check reduction gear surrounding area (oil seal, drain plug, and filler plug etc.) for oil leakage.

#### OIL LEVEL

- Remove filler plug ① and gasket. Then check that oil is filled up from mounting hole for the filler plug.
  **CAUTION:**
  **Turn the power switch OFF while checking oil level.**
- Set a gasket on filler plug and install it on reduction gear and tighten to the specified torque. Refer to TM-21, "Exploded View".
  **CAUTION:**
  - **Never reuse gasket.**
  - **If foreign matter, such as gear abrasion powder, is on the magnet of the filler plug, wipe it free of adherents before installation.**




### Draining and Refilling

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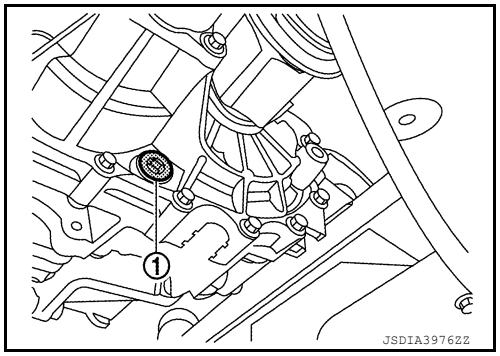
#### DRAINING

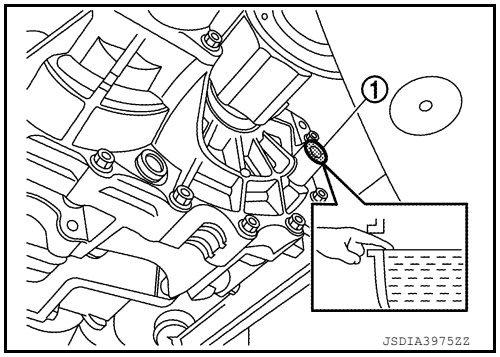
1. Turn the power switch OFF.
2. Remove filler plug.
3. Remove drain plug ① and drain gear oil.
4. Set a gasket on drain plug and install it to reduction gear and tighten to the specified torque. Refer to TM-21, "Exploded View".
   **CAUTION:**
   - **Never reuse gasket.**
   - **If foreign matter, such as gear abrasion powder, is on the magnet of the drain plug, wipe it free of adherents before installation.**




#### REFILLING

1. Remove filler plug ①. Fill with new gear oil until oil level reaches the specified level near filler plug mounting hole.

| | |
|---|---|
| **Oil grade** | **: Refer to MA-16, "FOR USA AND CANADA : Fluids and Lubricants" (USA and Canada) and MA-17, "FOR MEXICO : Fluids and Lubricants" (Mexico).** |
| **Oil capacity** | **: Refer to TM-27, "General Specifications".** |




2. After refilling oil, check oil level. Set a gasket on filler plug, then install it to reduction gear. Refer to TM-21, "Exploded View".
   **CAUTION:**
   - **Never reuse gasket.**
   - **If foreign matter, such as gear abrasion powder, is on the magnet of the filler plug, wipe it free of adherents before installation.**

# REMOVAL AND INSTALLATION

## EARTH BRUSH

### Exploded View

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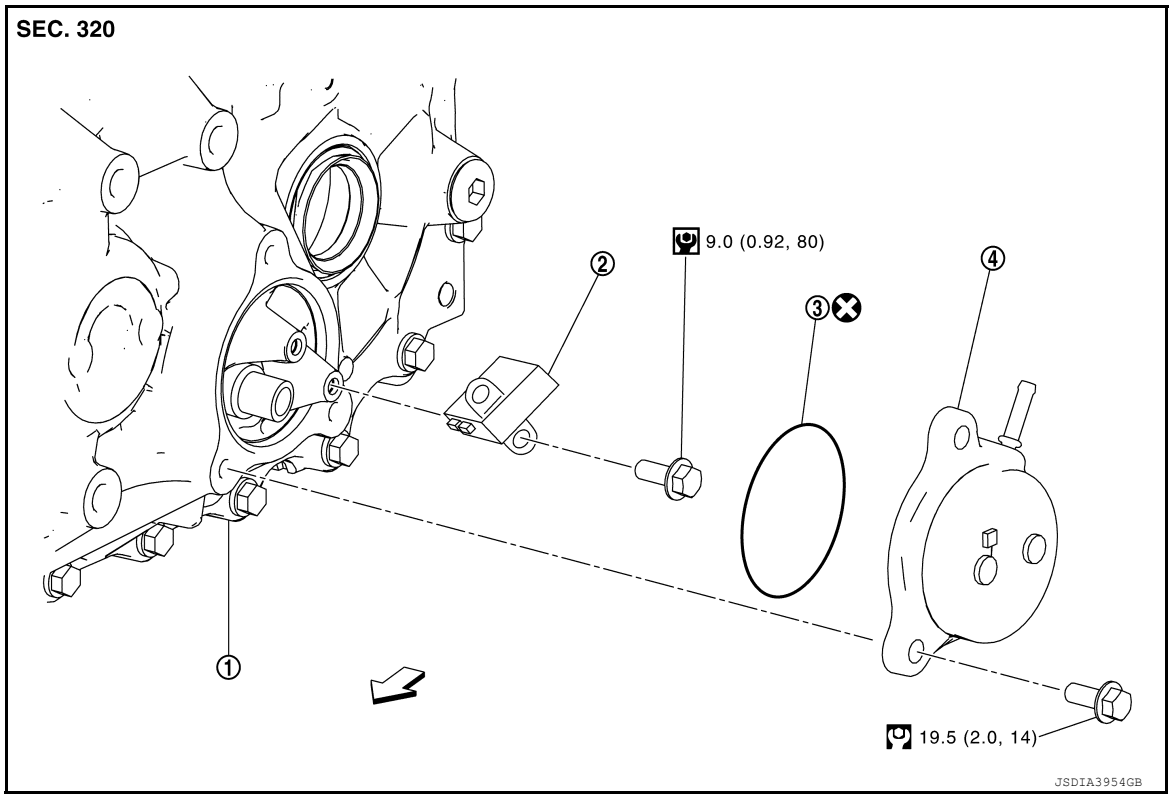


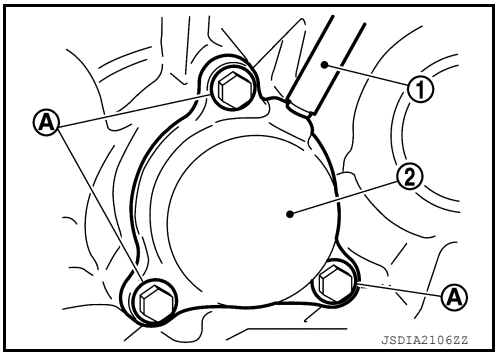

① Reduction gear ② Earth brush ③ O-ring
④ Brush cover
⇦ : Vehicle front
: Always replace after every disassembly.
: N·m (kg-m, in-lb)
: N·m (kg-m, ft-lb)

### Removal and Installation

INFOID:0000000010119526

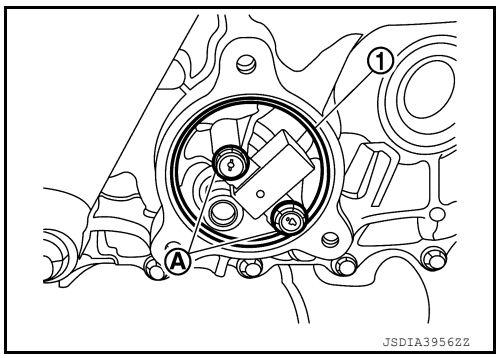
REMOVAL

1. Remove front under cover. Refer to EXT-23, "FRONT UNDER COVER : Removal and Installation".
2. Disconnect breather hose ① from brush cover ②, then remove the brush cover bolts Ⓐ and remove brush cover.



3. Remove O-ring ①. Remove brush fixing bolts Ⓐ, then remove earth brush.

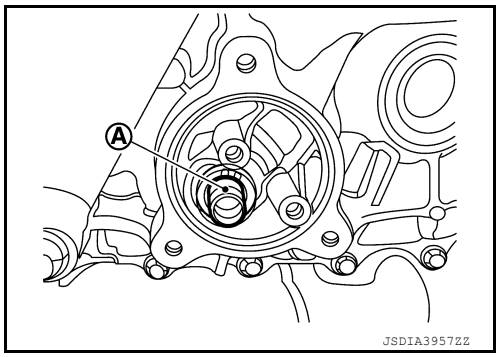
**CAUTION:**
- **Carefully remove earth brush, because the spring in the earth brush pushes out the brush.**
- **Never touch brush area.**



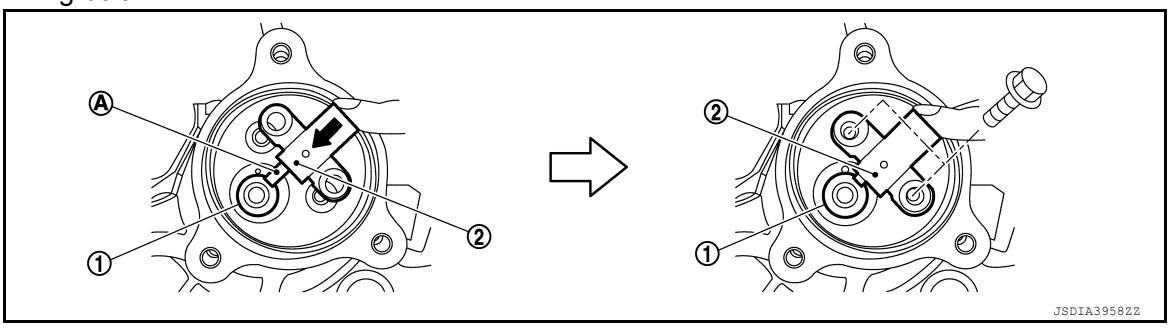

INSTALLATION

Note the following, and install in the reverse order of removal.

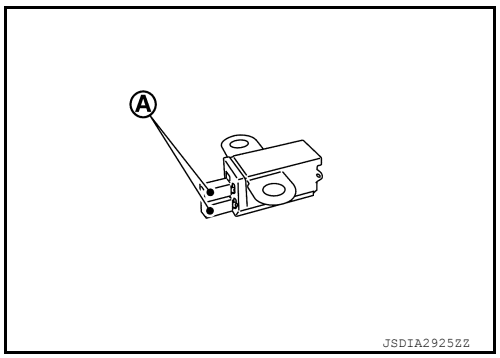
**CAUTION:**
- **Degrease shaft surface (brush contact surface) Ⓐ, and verify that there is no dust or other substance on it, then install the earth brush.**
- **Degrease brush surface, and verify that there is no dust or other substance on it, then install the earth brush.**
- **Never reuse O-ring.**
- **Never apply oil to O-ring. Verify that there is no oil on it, then install O-ring.**
- **Never touch brush area.**




- When assembling earth brush, do not touch brush area Ⓐ, press earth brush ② onto shaft ① and fasten with brush fixing bolt.




**CAUTION:**
**Never touch brush area Ⓐ.**




When Replacing With New Part

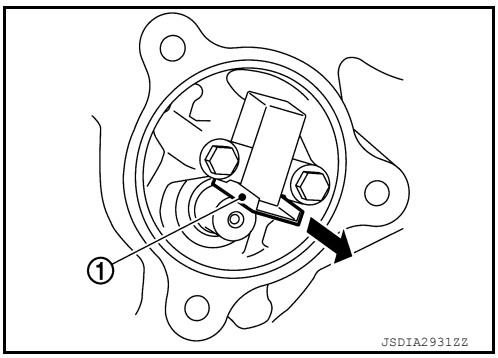
**NOTE:**

A new earth brush includes a stopper for preventing brush pop-out. Install with stopper attached.

When installing a new earth brush, pull out stopper ① after installation, allowing brush to contact shaft.

**CAUTION:**

**Before installation, degrease the stopper surface (shaft side) and check that the surface is free of foreign matter.**




## Inspection

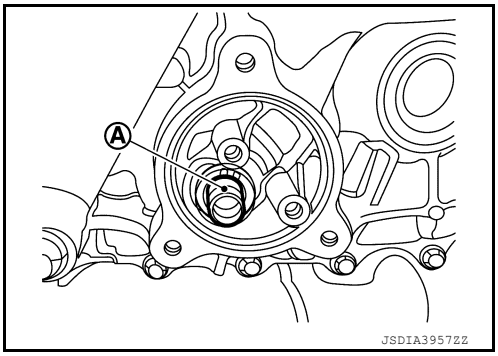
INFOID:0000000010119527

### INSPECTION OF REDUCTION GEAR MAIN SHAFT

Check that there is no substance such as oil and dust on main shaft surface Ⓐ, and that no corrosion has occurred.

**CAUTION:**

- **When substances such as oil and dust are adherent to the shaft surface (brush contact surface), remove them and degrease the shaft surface to install brush.**
- **When there is corrosion on shaft surface, remove corrosion to install brush.**



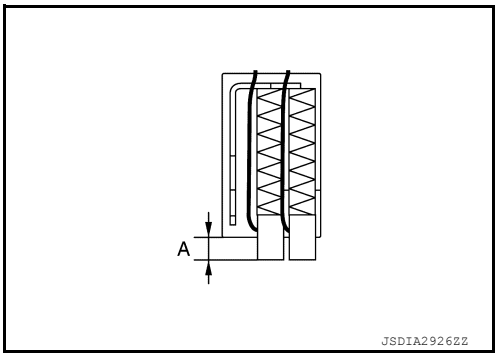

### INSPECTION FOR BRUSH WEAR

Remove earth brush and measure amount of protrusion (A). If it is at or below limit value, replace earth brush.

**Brush wear limit** : **TM-27, "Earth Brush"**

**CAUTION:**

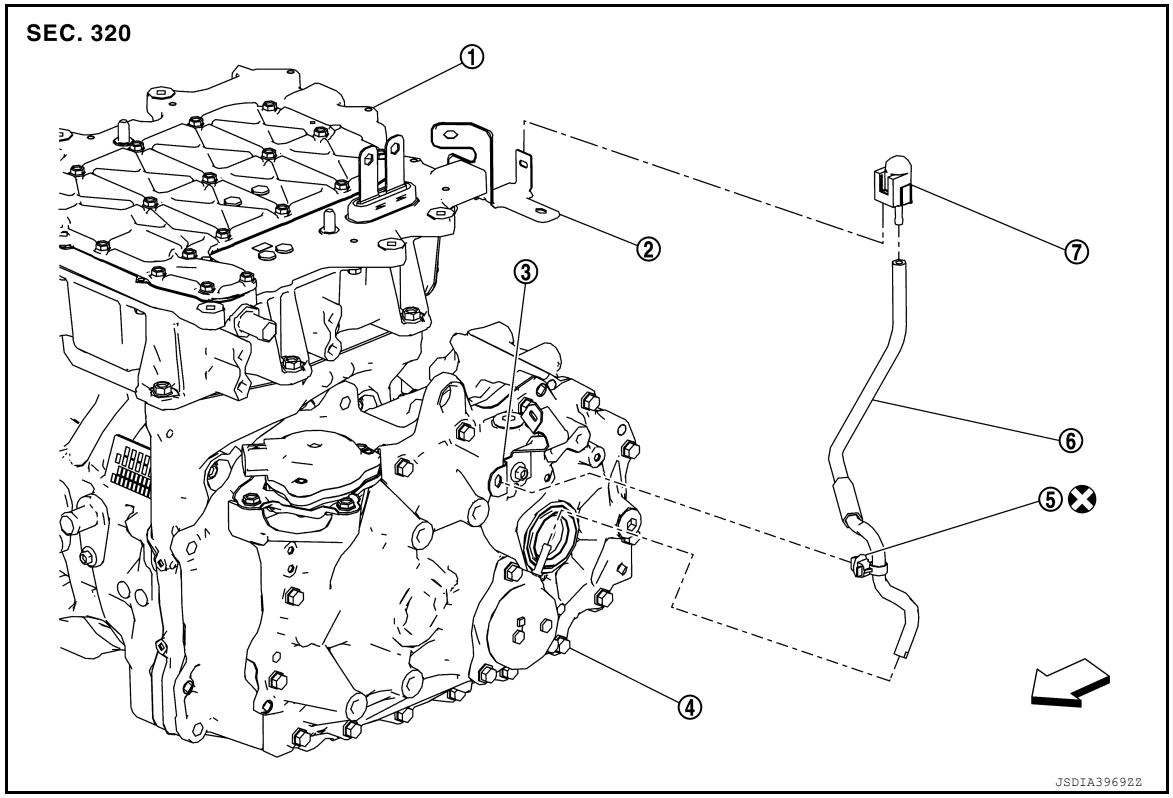
**When reusing with original parts, never allow oil to contact brush area. Refer to TM-14, "Removal and Installation".**



# BREATHER HOSE

## Exploded View

INFOID:0000000010119528




| | | |
|---|---|---|
| ① Inverter | ② Harness bracket | ③ Harness bracket |
| ④ Reduction gear | ⑤ Clip | ⑥ Breather hose |
| ⑦ Breather | | |

⇦ : Vehicle front

⊗ : Always replace after every disassembly.

## Removal and Installation

INFOID:0000000010119529

**DANGER:**

**Since hybrid vehicles and electric vehicles contain a high voltage battery, there is the risk of electric shock, electric leakage, or similar accidents if the high voltage component and vehicle are handled incorrectly. Be sure to follow the correct work procedures when performing inspection and maintenance.**

**WARNING:**

- **Be sure to remove the service plug in order to disconnect the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.**
- **The removed service plug must always be carried in a pocket of the responsible worker or placed in the tool box during the procedure to prevent the plug from being connected by mistake.**
- **Be sure to wear insulating protective equipment consisting of glove, shoes, face shield and glasses before beginning work on the high voltage system.**
- **Never allow workers other than the responsible person to touch the vehicle containing high voltage parts. To keep others from touching the high voltage parts, these parts must be covered with an insulating sheet except when using them.**
- **Refer to TM-5, "High Voltage Precautions".**

**CAUTION:**

**Never bring the vehicle into the READY status with the service plug removed unless otherwise instructed in the Service Manual. A malfunction may occur if this is not observed.**

REMOVAL

**WARNING:**

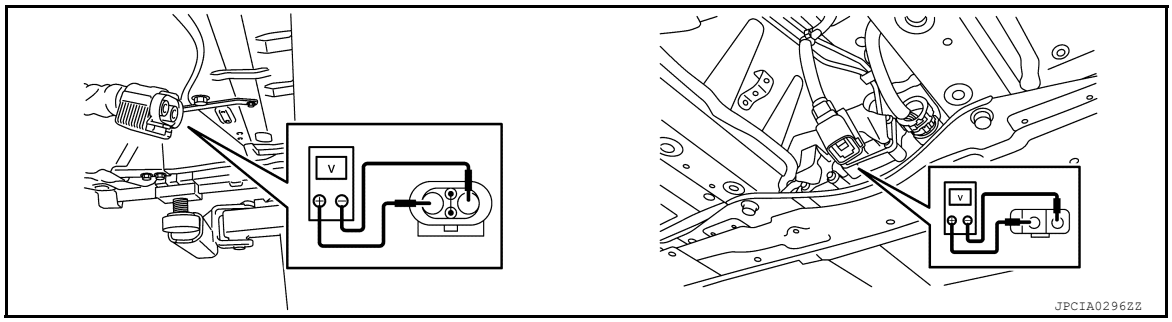
**Disconnect the high voltage. Refer to GI-33, "How to Disconnect High Voltage".**

1. Check voltage in high voltage circuit. (Check that condenser are discharged.)

a. Lift up the vehicle and remove the Li-ion battery under covers. Refer to EVB-181, "Exploded View".

b. Disconnect high voltage harness connector and PTC heater harness connector from front side of Li-ion battery. Refer to EVB-181, "Removal and Installation".

c. Measure voltage between high voltage harness connector terminals and PTC heater harness connector terminals.




**DANGER:**

**Touching high voltage components without using the appropriate protective equipment will cause electrocution.**

**Standard : 5 V or less**

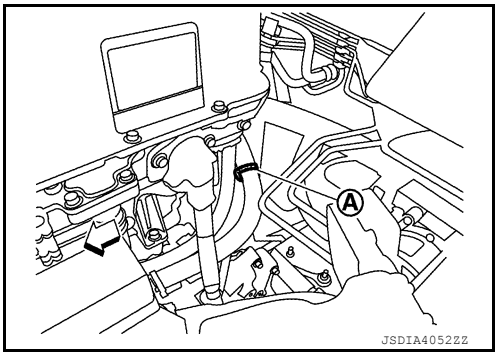
**CAUTION:**

**For voltage measurements, use a tester which can measure to 500 V or higher.**

2. Remove front under cover. Refer to EXT-23, "FRONT UNDER COVER : Removal and Installation".

3. Remove clip Ⓐ of normal charge port from harness bracket.

⇦ : Vehicle front

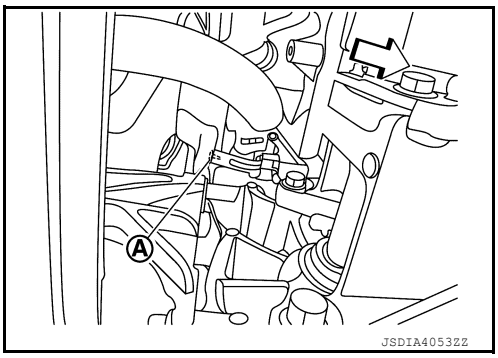



**WARNING:**

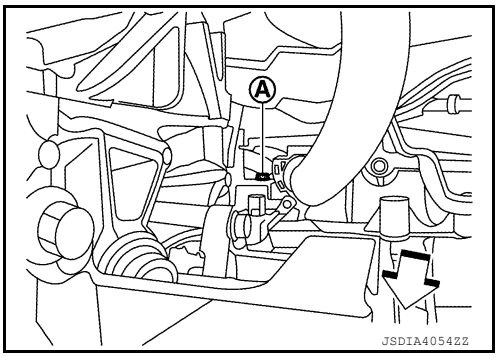
**To prevent electric shock hazards, be sure to put on insulating protective gear before beginning work on the high voltage system.**

4. Remove acoustic insulator mounting screw Ⓐ.

⇦ : Vehicle front



5. Remove harness bracket mounting bolt Ⓐ.

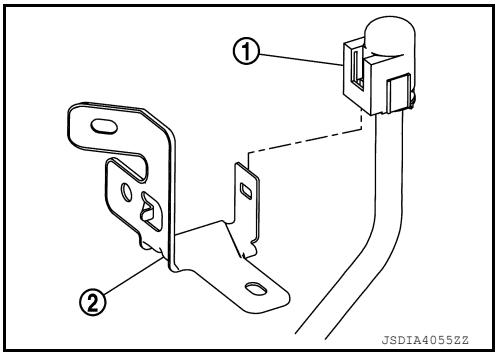



⇦ : Vehicle front

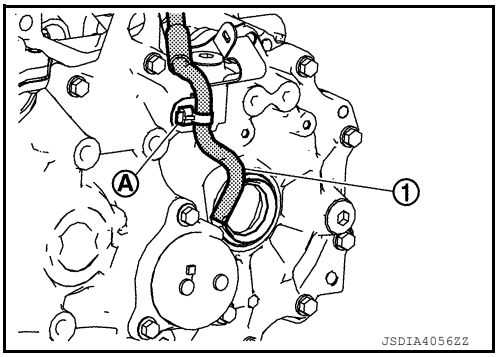
**WARNING:**
**To prevent electric shock hazards, be sure to put on insulating protective gear before beginning work on the high voltage system.**

6. Remove breather ① from harness bracket ②.

**WARNING:**
**To prevent electric shock hazards, be sure to put on insulating protective gear before beginning work on the high voltage system.**




7. Remove clip Ⓐ of breather hose from harness bracket and pull out breather hose ① from brush cover tube of reduction gear.



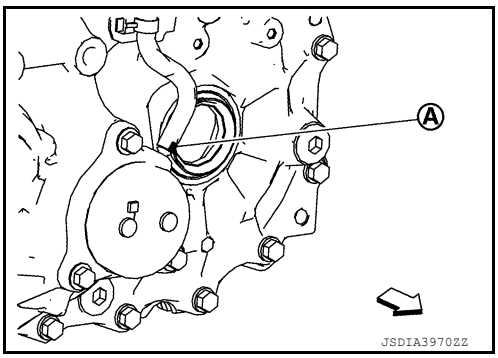

## INSTALLATION

**WARNING:**
**To prevent electric shock hazards, be sure to put on insulating protective gear before beginning work on the high voltage system.**

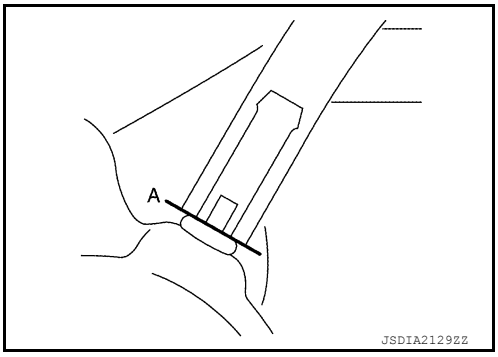
**CAUTION:**
- **Never reuse resin clip (hose clip).**
- **Be careful not to be crushed or blocked by folding or bending the hose when installing the breather hose.**
- **Ensure the breather is securely installed to the bracket.**
- **Ensure the clips are securely installed to the brackets.**

- **Install breather hose so that the paint mark Ⓐ is facing leftward.**

  ⇦ : Vehicle left




- **As shown in figure, fit breather hose onto brush cover tube part all the way to its base (A).**

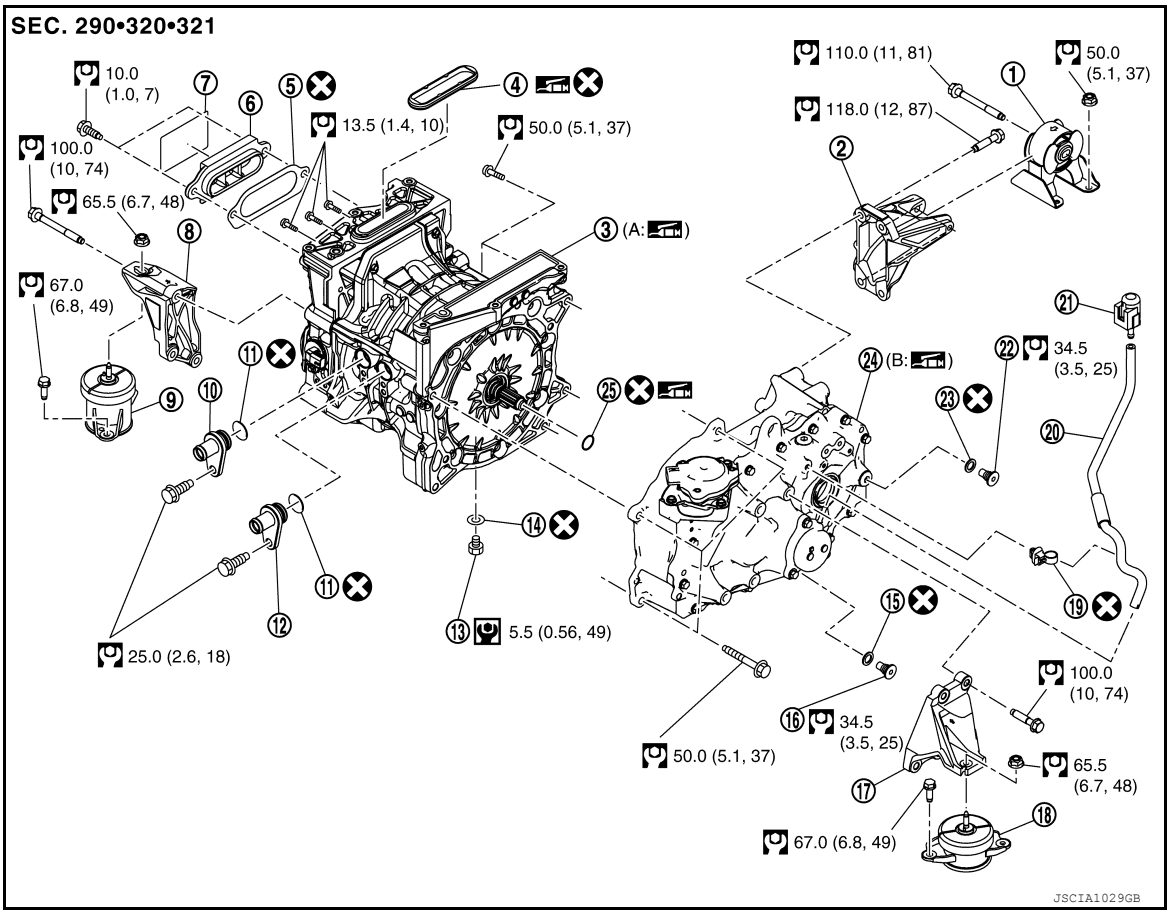


# UNIT REMOVAL AND INSTALLATION

## REDUCTION GEAR

### Exploded View

INFOID:0000000010119530




| | | | | | |
|---|---|---|---|---|---|
| ① | Motor mounting rear | ② | Motor mounting rear bracket | ③ | Traction motor |
| ④ | Seal | ⑤ | Gasket | ⑥ | 3-phase bus bar cover |
| ⑦ | High voltage warning label | ⑧ | Motor mounting RH bracket | ⑨ | Motor mounting RH |
| ⑩ | Water inlet | ⑪ | O-ring | ⑫ | Water outlet |
| ⑬ | Drain plug | ⑭ | Copper washer | ⑮ | Gasket |
| ⑯ | Drain plug | ⑰ | Motor mounting LH bracket | ⑱ | Motor mounting LH |
| ⑲ | Clip | ⑳ | Breather hose | ㉑ | Breather box |
| ㉒ | Filler plug | ㉓ | Gasket | ㉔ | Reduction gear |
| ㉕ | O-ring | | | | |

A. Shaft spline B. Inside of input shaft (inside of spline)

: N·m (kg-m, in-lb)

: N·m (kg-m, ft-lb)

: Always replace after every disassembly.

: Apply lithium-based grease including molybdenum disulphide.

### Removal and Installation

INFOID:0000000010119531

**DANGER:**

**Since hybrid vehicles and electric vehicles contain a high voltage battery, there is the risk of electric shock, electric leakage, or similar accidents if the high voltage component and vehicle are handled incorrectly. Be sure to follow the correct work procedures when performing inspection and maintenance.**

**WARNING:**

- **Be sure to remove the service plug in order to disconnect the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.**
- **The removed service plug must always be carried in a pocket of the responsible worker or placed in the tool box during the procedure to prevent the plug from being connected by mistake.**
- **Be sure to wear insulating protective equipment consisting of glove, shoes, face shield and glasses before beginning work on the high voltage system.**
- **Never allow workers other than the responsible person to touch the vehicle containing high voltage parts. To keep others from touching the high voltage parts, these parts must be covered with an insulating sheet except when using them.**
- **Refer to TM-5, "High Voltage Precautions".**

**CAUTION:**

**Never bring the vehicle into the READY status with the service plug removed unless otherwise instructed in the Service Manual. A malfunction may occur if this is not observed.**

## REMOVAL

**WARNING:**

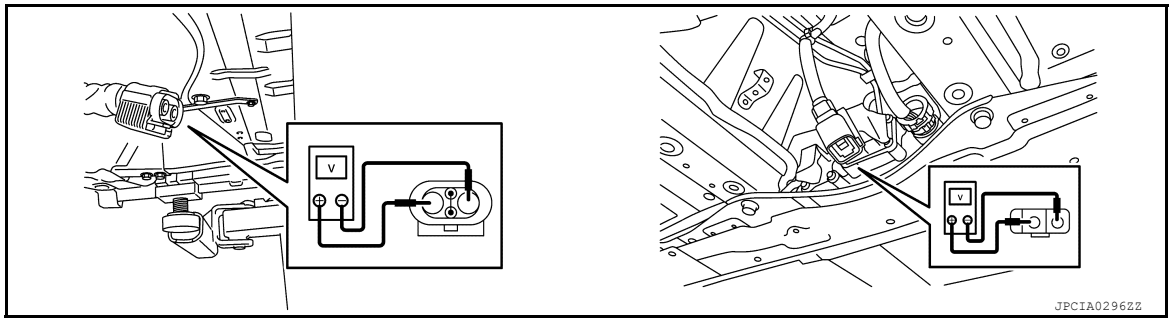
**Disconnect the high voltage. Refer to GI-33, "How to Disconnect High Voltage".**

1. Check voltage in high voltage circuit. (Check that condenser are discharged.)

a. Lift up the vehicle and remove the Li-ion battery under covers. Refer to EVB-181, "Exploded View".

b. Disconnect high voltage harness connector and PTC heater harness connector from front side of Li-ion battery. Refer to EVB-181, "Removal and Installation".

c. Measure voltage between high voltage harness connector terminals and PTC heater harness connector terminals.




**DANGER:**

**Touching high voltage components without using the appropriate protective equipment will cause electrocution.**

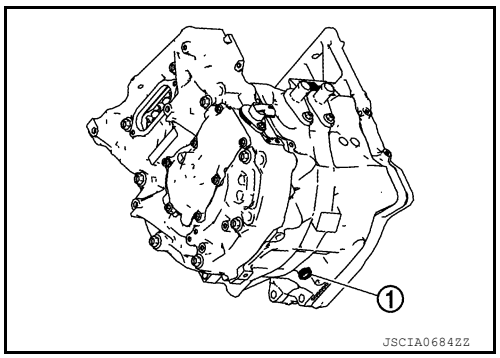
**Standard : 5 V or less**

**CAUTION:**

**For voltage measurements, use a tester which can measure to 500 V or higher.**

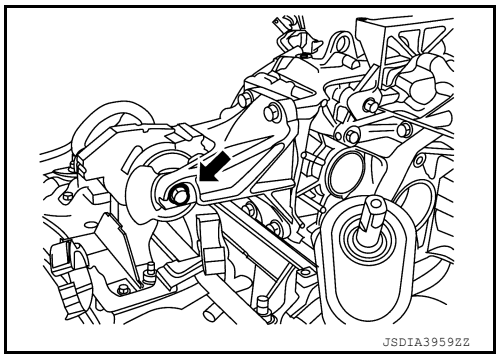
2. Remove front under cover. Refer to EXT-23, "FRONT UNDER COVER : Removal and Installation".

3. Remove drain bolt ① of traction motor to drain coolant.



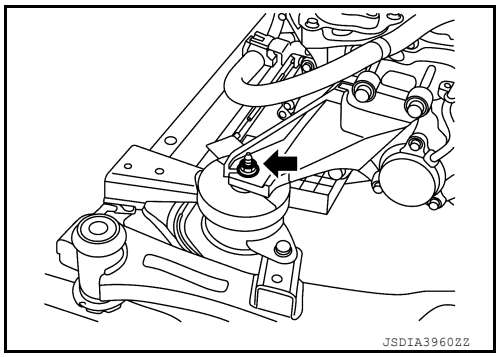

**WARNING:**
**To prevent electric shock hazards, be sure to put on insulating protective gear before beginning work on the high voltage system.**

4. Drain reduction gear oil. Refer to TM-13, "Draining and Refilling".
5. Remove electric power train and reduction gear from vehicle together as suspension member assembly. Refer to FSU-22, "Removal and Installation".
6. Remove PDM (Power Delivery Module). Refer to VC-112, "Removal and Installation".
7. Remove traction motor inverter. Refer to TMS-103, "Removal and Installation".
8. Remove joint bolt (⬅) of motor mounting rear bracket and motor mounting rear.



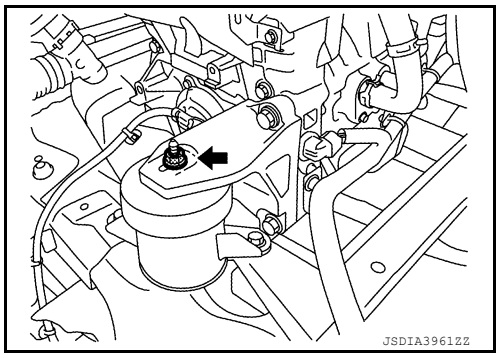

**WARNING:**
**To prevent electric shock hazards, be sure to put on insulating protective gear before beginning work on the high voltage system.**

9. Remove joint bolt (⬅) of motor mounting LH bracket and motor mounting LH.




**WARNING:**
**To prevent electric shock hazards, be sure to put on insulating protective gear before beginning work on the high voltage system.**

10. Remove joint bolt (⬅) of motor mounting RH bracket and motor mounting RH.




**WARNING:**
**To prevent electric shock hazards, be sure to put on insulating protective gear before beginning work on the high voltage system.**

11. Hook the sling belt to each motor mounting bracket and prepare to disconnect the traction motor and reduction gear from the front suspension member assembly.
12. Hoist the traction motor and reduction gear and disconnect them from the front suspension member assembly.

**WARNING:**
**To prevent electric shock hazards, be sure to put on insulating protective gear before beginning work on the high voltage system.**

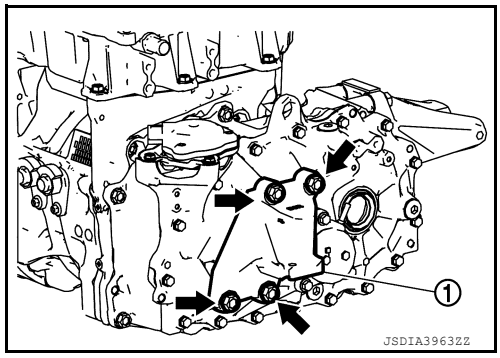
**CAUTION:**
**When hoisting the traction motor and reduction gear, insert a long bolt into the motor mounting bracket to prevent the sling belt from slipping out. At that time, be sure to install a nut.**

13. Remove support bearing bracket of drive shaft (right side). Refer to FAX-19, "RIGHT SIDE : Removal and Installation".

**WARNING:**
**To prevent electric shock hazards, be sure to put on insulating protective gear before beginning work on the high voltage system.**

14. Remove motor mounting LH bracket ①.

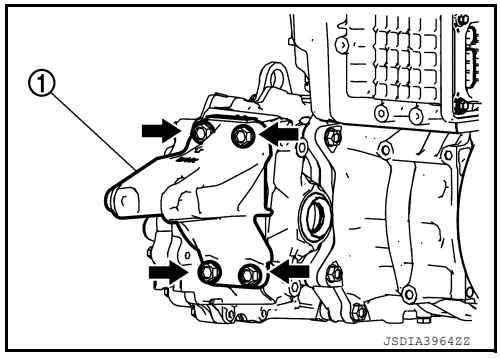
**WARNING:**
**To prevent electric shock hazards, be sure to put on insulating protective gear before beginning work on the high voltage system.**




⬅ : Bolt

15. Remove motor mounting rear bracket ①.

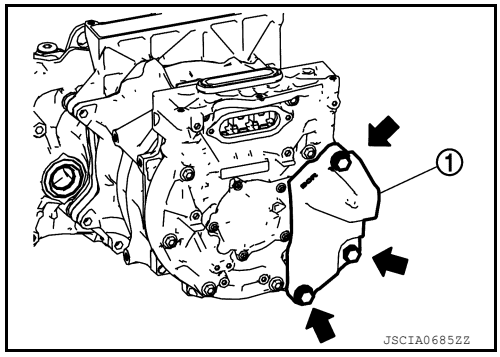
**WARNING:**
**To prevent electric shock hazards, be sure to put on insulating protective gear before beginning work on the high voltage system.**




⬅ : Bolt

16. Remove motor mounting RH bracket ①.

**WARNING:**
**To prevent electric shock hazards, be sure to put on insulating protective gear before beginning work on the high voltage system.**




⬅ : Bolt

17. Remove joint bolts traction motor and reduction gear.

**WARNING:**
**To prevent electric shock hazards, be sure to put on insulating protective gear before beginning work on the high voltage system.**

18. Separate traction motor from reduction gear.

**WARNING:**

**To prevent electric shock hazards, be sure to put on insulating protective gear before beginning work on the high voltage system.**

## INSTALLATION

Note the following, and install in the reverse order of removal.

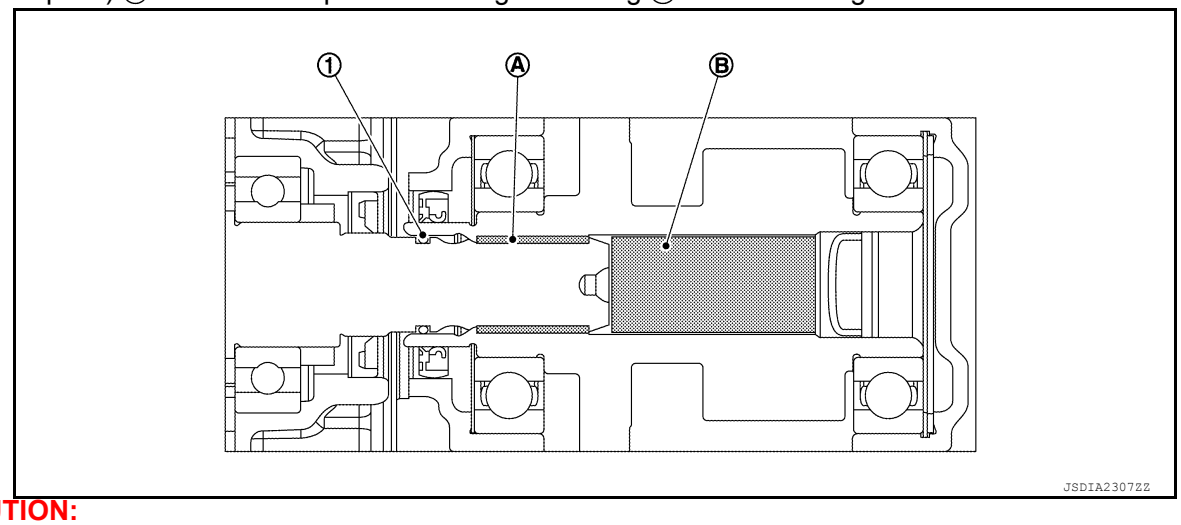
**WARNING:**

**To prevent electric shock hazards, be sure to put on insulating protective gear before beginning work on the high voltage system.**

**CAUTION:**

**When assembling the reduction gear and traction motor, clean the mating surface and be sure that no dust, dirt, or foreign material is between the surfaces.**

- Before installing reduction gear and traction motor, apply grease to full periphery of shaft spline Ⓐ, and also inject grease [minimum 10 g (0.4 oz), maximum less than 20 g (0.7 oz)] into reduction gear input shaft (inside spline) Ⓑ. Take care to prevent damage to O-ring ① when installing.




**CAUTION:**

- **Before applying grease, clean old grease and wear particles, that are adhered to the grease applying parts.**
- **When installing O-ring, clean the O-ring installation groove completely, and then install.**

- When all parts are installed, be sure to check equipotential of traction motor, PDM (Power Delivery Module), and traction motor inverter.

- Traction motor: Refer to TM-25, "Inspection and Adjustment".
- PDM (Power Delivery Module): Refer to VC-125, "Inspection".
- Traction motor inverter: Refer to TMS-107, "Inspection and Adjustment".

## Inspection and Adjustment

INFOID:0000000010119532

### INSPECTION AFTER INSTALLATION

After installing traction motor, measure resistance below.

- Between traction motor (aluminum part) and body (ground bolt).
- Between traction motor (aluminum part) and other high voltage system.

**WARNING:**

**To prevent electric shock hazards, be sure to put on insulating protective gear before beginning work on the high voltage system.**

**Standard : Less than 0.1 Ω**

If result deviates from standard values, check that no paint, oil, dirt, or other substance is adhering to bolts or conductive mounting parts. If any such substance is adhering, clean the surrounding area and remove the substance.

## ADJUSTMENT AFTER INSTALLATION

It is necessary to perform writing of the traction motor resolver offset to the traction motor inverter after the traction motor is replaced. Refer to TMS-39, "Work Procedure".

# SERVICE DATA AND SPECIFICATIONS (SDS)

## SERVICE DATA AND SPECIFICATIONS (SDS)

### General Specifications

INFOID:0000000010119533

| | | |
|---|---|---|
| Reduction gear model | | RE1F61B |
| Gear ratio | | 8.193 |
| Number of teeth | Input gear | 17 |
| | Main gear (IN / OUT) | 32 / 17 |
| | Final gear | 74 |
| Oil capacity (Approx.) | ℓ (US pt, Imp pt) | 1.41 (3, 2-1/2) |

### Earth Brush

INFOID:0000000010119534

Unit: mm (in)

| Item | Limit |
|---|---|
| Brush wear amount | 4.0 (0.157) |

# PRECAUTION

## PRECAUTIONS

### Precaution for Technicians Using Medical Electric

INFOID:0000000010119535

#### OPERATION PROHIBITION

**WARNING:**

- **Parts with strong magnet is used in this vehicle.**
- **Technicians using a medical electric device such as pacemaker must never perform operation on the vehicle, as magnetic field can affect the device function by approaching to such parts.**

#### NORMAL CHARGE PRECAUTION

**WARNING:**

- **If a technician uses a medical electric device such as an implantable cardiac pacemaker or an implantable cardioverter defibrillator, the possible effects on the devices must be checked with the device manufacturer before starting the charge operation.**
- **As radiated electromagnetic wave generated by PDM (Power Delivery Module) at normal charge operation may affect medical electric devices, a technician using a medical electric device such as implantable cardiac pacemaker or an implantable cardioverter defibrillator must not approach motor room [PDM (Power Delivery Module)] at the hood-opened condition during normal charge operation.**

#### PRECAUTION AT TELEMATICS SYSTEM OPERATION

**WARNING:**

- **If a technician uses implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), avoid the device implanted part from approaching within approximately 220 mm (8.66 in) from interior/exterior antenna.**
- **The electromagnetic wave of TCU might affect the function of the implantable cardiac pacemaker or the implantable cardioverter defibrillator (ICD), when using the service, etc.**
- **If a technician uses other medical electric devices than implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), the electromagnetic wave of TCU might affect the function of the device. The possible effects on the devices must be checked with the device manufacturer before TCU use.**

#### PRECAUTION AT INTELLIGENT KEY SYSTEM OPERATION

**WARNING:**

- **If a technician uses implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), avoid the device implanted part from approaching within approximately 220 mm (8.66 in) from interior/exterior antenna.**
- **The electromagnetic wave of Intelligent Key might affect the function of the implantable cardiac pacemaker or the implantable cardioverter defibrillator (ICD), at door operation, at each request switch operation, or at engine starting.**
- **If a technician uses other medical electric devices than implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), the electromagnetic wave of Intelligent Key might affect the function of the device. The possible effects on the devices must be checked with the device manufacturer before Intelligent Key use.**

### Point to Be Checked Before Starting Maintenance Work

INFOID:0000000010119536

**The high voltage system may starts automatically. It is required to check that the timer air conditioner and timer charge (during EVSE connection) are not set before starting maintenance work.**
**NOTE:**
If the timer air conditioner or timer charge (during EVSE connection) is set, the high voltage system starts automatically even when the power switch is in OFF state.

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

INFOID:0000000010119537

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 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, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the 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

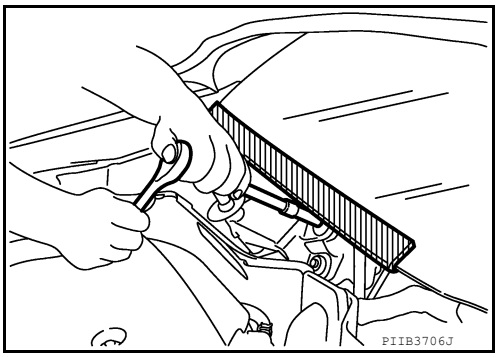
**WARNING:**

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

## Precaution for Procedure without Cowl Top Cover

*INFOID:0000000010119538*

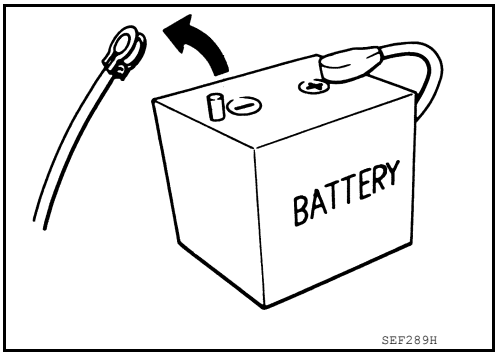
When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc to prevent damage to windshield.




## Precautions for Removing Battery Terminal

*INFOID:0000000010119539*

- When removing the 12V battery terminal, turn OFF the power switch and wait at least 5 minutes.
  **NOTE:**
  ECU may be active for several minutes after the power switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.
- Always disconnect the battery terminal within 60 minutes after turning OFF the power switch. Even when the power switch is OFF, the 12V battery automatic charge control may automatically start after a lapse of 60 minutes from power switch OFF.
- Disconnect 12V battery terminal according to the following steps.




WORK PROCEDURE

1. Check that EVSE is not connected.
   **NOTE:**
   If EVSE is connected, the air conditioning system may be automatically activated by the timer A/C function.
2. Turn the power switch OFF → ON → OFF. Get out of the vehicle. Close all doors (including back door).
3. Check that the charge status indicator lamp does not blink and wait for 5 minutes or more.
   **NOTE:**

If the battery is removed within 5 minutes after the power switch is turned OFF, plural DTCs may be detected.

4. Remove 12V battery terminal within 60 minutes after turning the power switch OFF → ON → OFF.
   **CAUTION:**
   - **After all doors (including back door) are closed, if a door (including back door) is opened before battery terminals are disconnected, start over from Step 1.**
   - **After turning the power switch OFF, if "Remote A/C" is activated by user operation, stop the air conditioner and start over from Step 1.**

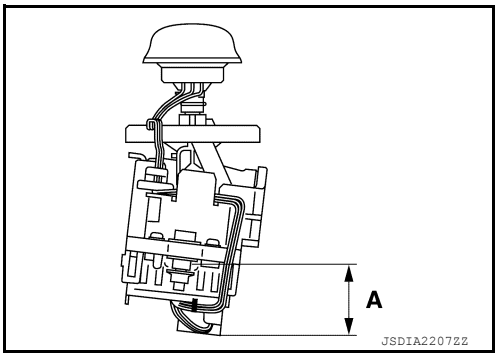
   **NOTE:**
   Once the power switch is turned ON → OFF, the 12V battery automatic charge control does not start for approximately 1 hour.

- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the power switch.
  **NOTE:**
  If the power 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.

## General Precautions

INFOID:0000000010119540

- Never turn the power switch ON while the selector lever is in the D or R position. Otherwise, the vehicle may start abruptly resulting in an accident.
- Never shift the selector lever to the R position while the vehicle is moving forward, or to the D position while moving backward, or press the P position switch while the vehicle is in motion. Otherwise, excessive force may be applied to the drive system causing damage.
- Never allow the vehicle to coast backward while the selector lever is in the D position or forward while the selector lever is in the R position.
- Part A shown in the figure contains a strong magnet. Persons with an electro-medical apparatus should keep away from this area. Otherwise, the magnet may cause the electro-medical apparatus to malfunction.
- Keep magnetic objects, such as magnetic cards, and metal products (e.g. watches) away from the area surrounding the magnet.



# SYSTEM DESCRIPTION

## DESCRIPTION

### Description

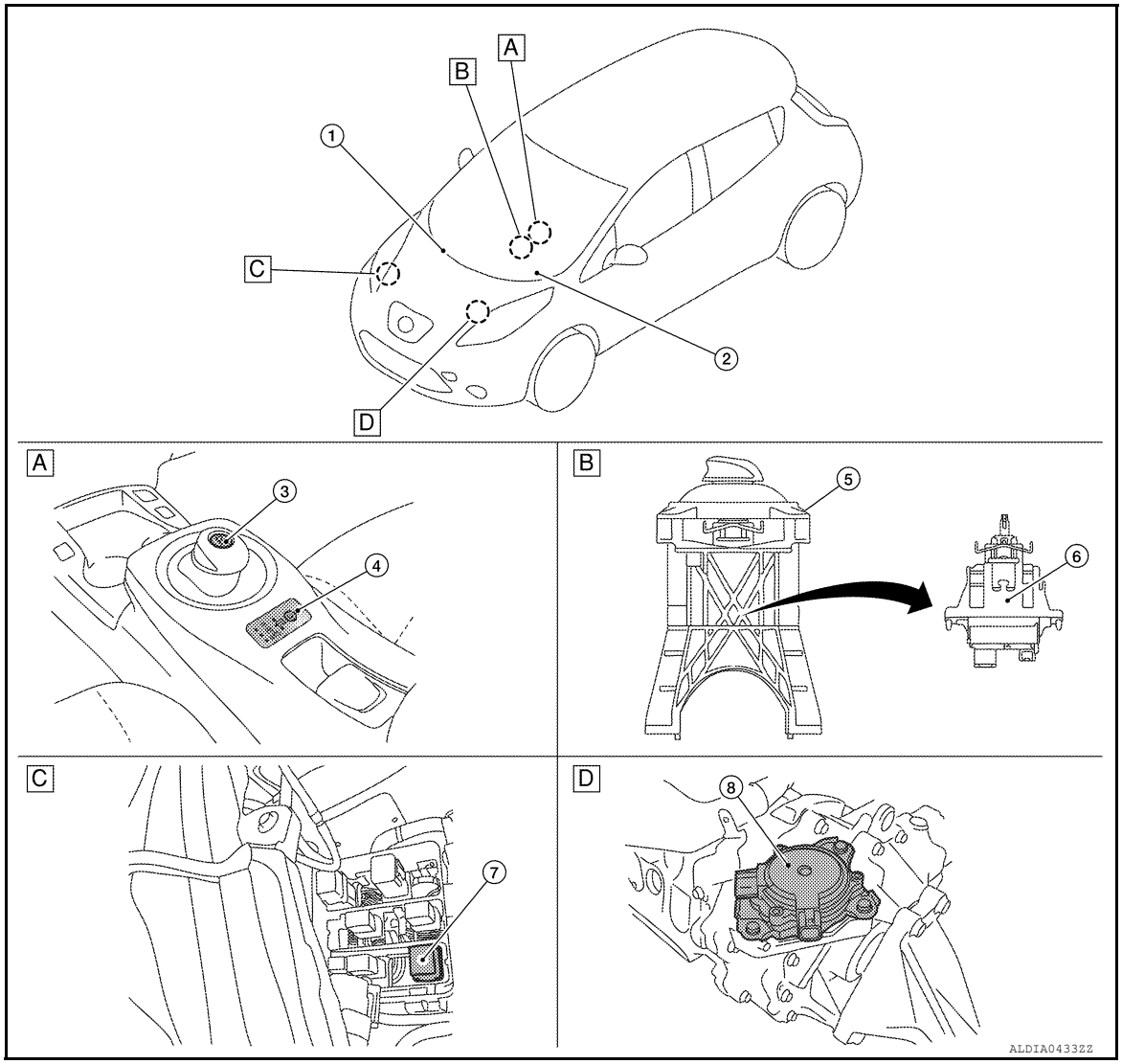
INFOID:0000000010119541

- Instead of the conventional mechanical shift mechanism, the electric shift system is adopted which electrically detects shifting operation and locks/unlocks the parking mechanism by operating the parking actuator.
- The electric shift control module is build into the VCM.
  **NOTE:**
  In this section, the electric shift control module built in VCM is referred to as “Electric shift control module” for describing its functions.
- The momentary-type selector lever is adopted for mouse-like fine shift operability.
- The automatic P position function, which automatically shifts the gear to the P position if the power switch is turned OFF in the each position, is adopted.
- For improved functionality and operability, the P position switch, which allows direct switching to the P position at the touch of the switch, is provided on the top of the selector lever.

# COMPONENT PARTS

## Component Parts Location

INFOID:0000000010119542




A Finisher
B Electric shift selector
C Motor room, RH
D Reduction gear, upper

| No. | Name | Function |
|---|---|---|
| ① | VCM | • Refer to EVC-18, "VCM" for details.<br>• Refer to EVC-15, "Component Parts Location" for detailed installation location. |
| | Electric shift control module | TM-33, "Electric Shift Control Module" |
| ② | Combination meter<br>(Electric shift warning lamp, electric shift warning message, shift position indicator) | • Refer to MWI-6, "METER SYSTEM : Component Parts Location" for detailed installation location.<br>• Refer to TM-35, "Electric Shift Warning Lamp" for details of electric shift warning lamp.<br>• Refer to TM-36, "Electric Shift Warning Message" for details of electric shift warning message.<br>• Refer to TM-38, "Shift Position Indicator" for details of shift position indicator. |
| ③ | P position switch | TM-35, "P Position Switch" |

| No. | Name | Function |
|---|---|---|
| ④ | Selector indicator | TM-35, "Selector Indicator" |
| ⑤ | Electric shift selector | TM-34, "Electric Shift Selector" |
| ⑥ | Electric shift sensor | TM-35, "Electric Shift Sensor" |
| ⑦ | Parking actuator relay A | TM-34, "Parking Actuator Relay A" |
| ⑧ | Parking actuator | TM-33, "Parking Actuator" |

## Electric Shift Control Module

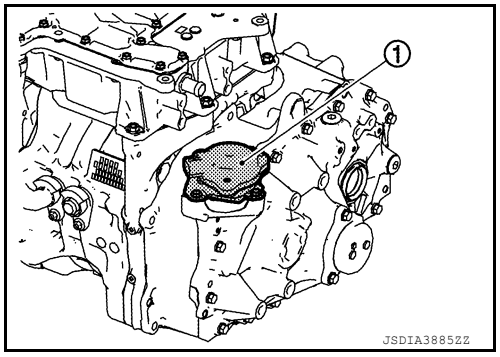
INFOID:0000000010119543

- The electric shift control module is build into the VCM.
  **NOTE:**
  In this section, the electric shift control module built in VCM is referred to as “Electric shift control module” for describing its functions.
- The electric shift control module is started by the power switch signal and wake-up signal transmitted from BCM.
- The electric shift control module determines the shift position based on the shift position data (ON/OFF signal) from the electric shift sensor, and transmits the shift position data to VCM and traction motor inverter via EV system CAN.
- The electric shift control module operates the parking actuator based on the signal from the P position switch.

## Parking Actuator

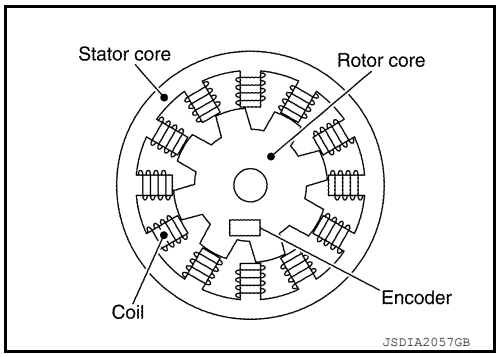
INFOID:0000000010119544

- The parking actuator ① is installed above the reduction gear.
- The parking actuator is operated by the signal from the electric shift control module and locks/unlocks the parking mechanism in the reducer.
- The parking actuator consists of the motor, encoder, and actuator reduction gear.




### MOTOR

- A 3-phase SR motor is used.
- Coil is placed on the stator core around the motor and the current that passes through the coil in sequence generates the rotating force for the inner rotor core.




### ENCODER

- The Hall IC type rotation angle sensor is used for higher accuracy in the detection of the rotor rotation angle.
- It detects the rotor rotation angle and outputs pulse signals to the electric shift control module.
- The electric shift control module controls the timing of the current feed to the coils optimally based on the signal from the encoder.

### ACTUATOR REDUCTION GEAR

The actuator reduction gear consists of a cycloidal gear and includes a motor with its torque amplified for secure operation under high torque-requiring conditions.

## Parking Actuator Relay A

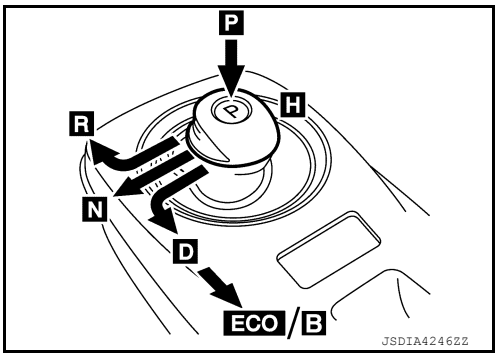
INFOID:0000000010119545

Parking actuator relay A is turned ON by the electric shift control module when the power switch is turned ON and supplies power to motor coil A located in the parking actuator.

## Electric Shift Selector

INFOID:0000000010119546

The electric shift selector consists of the selector lever, electric shift sensor, P position switch and others.

| Shift position | Operation/Function | |
|---|---|---|
| H<br>(Home position) | The selector lever automatically moves back to the home position after it is operated. |  |
| P<br>(P position switch) | Completely stop the vehicle and push the P position switch on the top of the selector lever while depressing the brake pedal. | |
| R | While depressing the brake pedal, slide the selector lever forward along the gate. | |
| N | While depressing the brake pedal, slide the selector lever to the left and hold it for approx. 1 second. | |
| D/ECO or B | • While depressing the brake pedal, slide the selector lever backward along the gate.<br>• If the selector lever is slid backward again while driving in the D position, the vehicle switches to ECO mode or B position.<br>• To switch from ECO mode or B position to the D position driving, slide the selector lever backward again.<br>• Refer to EVC-50, "ECO MODE/B MODE SYSTEM : System Description" for ECO mode and B position details. | |

### OPERATIONAL CONDITIONS FOR SHIFT

■: Hold ●: Current shift position ○: Be able to shift here

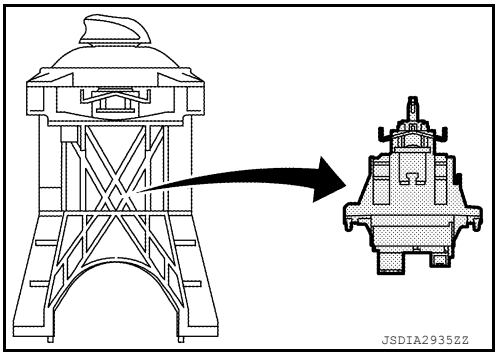
| POWER SW | Operation | Vehicle speed | Stop lamp switch | Shift position | | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | | | | P | R | N | D | ECO/B | |
| OFF/ACC | Selector lever | — | — | ■ | — | | | | — |
| | P position SW | — | — | ■ | — | | | | — |
| ON<br>(Not driving) | Selector lever | — | ON | ● | — | ○ | — | — | • Shifted to N position even when shifted to R or D position<br>• Shift position warning buzzer: Two short beeps |
| | | — | OFF | ■ | — | | | | Shift position warning buzzer: Two short beeps |
| | P position SW | — | — | ○ | — | ● | — | — | — |
| READY | Selector lever | — | ON | ● | ○ | ○ | ○ | ○* | — |
| | | — | OFF | ■ | — | | | | Shift position warning buzzer: Two short beeps |
| | P position SW | 5 km/h (3 MPH) or less | — | ○ | ● | ● | ● | ● | — |
| | | 5 km/h (3 MPH) or more | — | — | ■ | ■ | ■ | ■ | Shift position warning buzzer: Two short beeps |

*: Direct shifting to the ECO mode or B position from the P position is not possible.

## Electric Shift Sensor

INFOID:0000000010119547

- The electric shift sensor integrates 6 non-contact sensors (Hall IC) and transmits ON/OFF signals to the electric shift control module.




- The electric shift control module determines the shift position from the combination of the ON/OFF signals.

| Electric shift control module recognition position | Selector lever position | P position SW | Electric shift sensor | | | | | | P position SW | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | No. 1 | No. 2 | No. 3 | No. 4 | No. 5 | No. 6 | No. 1 | No. 2 |
| H | H | No push | OFF | OFF | ON | OFF | OFF | ON | OFF | ON |
| P | H | Push | OFF | OFF | ON | OFF | OFF | ON | ON | OFF |
| R | R | No push | ON | ON | OFF | OFF | OFF | OFF | OFF | ON |
| N | N | No push | OFF | ON | ON | ON | OFF | OFF | OFF | ON |
| D | D | No push | OFF | OFF | OFF | ON | ON | OFF | OFF | ON |

## P Position Switch

INFOID:0000000010119548

- The P position switch allows direct one-touch switching to the P position from any position while the vehicle is stopped.
- The P position switch does not have a function to cancel the P position.
- The P position switch transmits the ON/OFF signals of 2 contact switches to the electric shift control module.

| Electric shift control module recognition position | Selector lever position | P position SW | Electric shift sensor | | | | | | P position SW | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | No. 1 | No. 2 | No. 3 | No. 4 | No. 5 | No. 6 | No. 1 | No. 2 |
| H | H | No push | OFF | OFF | ON | OFF | OFF | ON | OFF | ON |
| P | H | Push | OFF | OFF | ON | OFF | OFF | ON | ON | OFF |
| R | R | No push | ON | ON | OFF | OFF | OFF | OFF | OFF | ON |
| N | N | No push | OFF | ON | ON | ON | OFF | OFF | OFF | ON |
| D | D | No push | OFF | OFF | OFF | ON | ON | OFF | OFF | ON |

## Selector Indicator

INFOID:0000000010119549

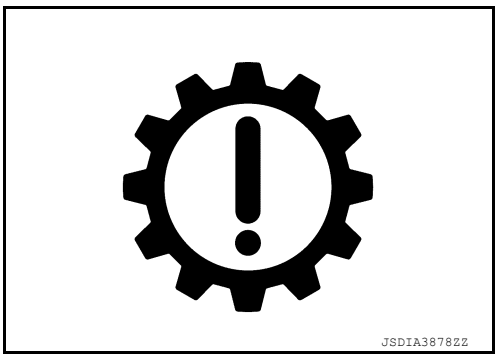
The selector indicator is located in the finisher area and the lamp for the currently selected shift position illuminates.

## Electric Shift Warning Lamp

INFOID:0000000010119550

DESIGN/PURPOSE

The electric shift warning lamp warns the driver of a malfunction in the electric shift system.




BULB CHECK

For 2 seconds after the ignition switch is turned ON.

SYNCHRONIZATION WITH MASTER WARNING LAMP

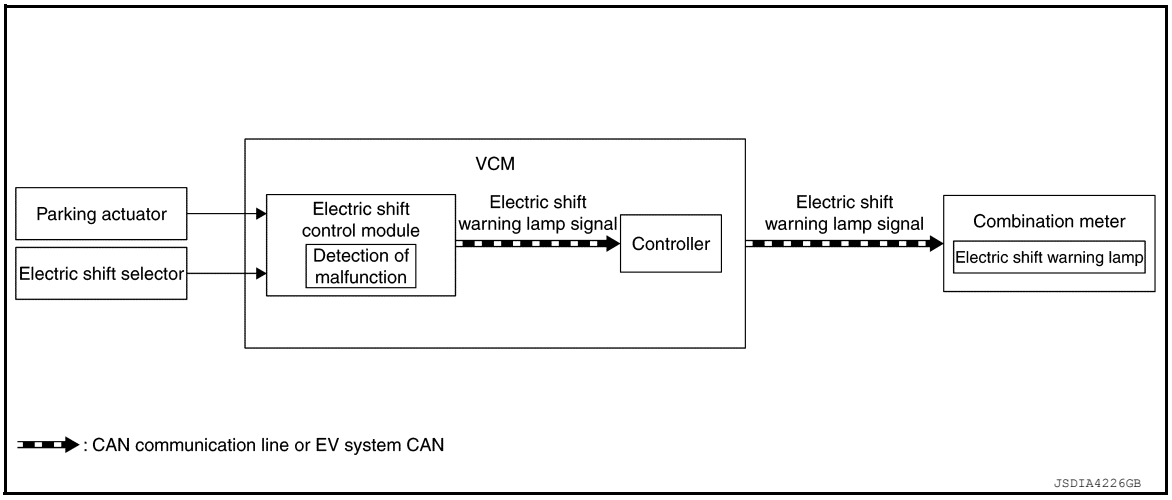
Applicable

Refer to MWI-31, "MASTER WARNING LAMP : System Description" for details of master warning lamp.

OPERATION AT COMBNATION METER CNA COMMUNICATION CUT-OFF OR UNUSUAL SIGNAL

For actions on CAN communications blackout in the combination meter, refer to MWI-64, "Fail-Safe".

SYSTEM DIAGRAM




SIGNAL PATH

- The electric shift control module transmits an electric shift warning lamp signal to the controller of VCM when detecting a malfunction in the electric shift system.
- VCM transmits that signal to combination meter.
- The combination meter turns ON the electric shift warning lamp when receiving an electric shift warning lamp signal.

LIGHTING CONDITION

- A malfunction is detected in the electric shift system.
- For the relationship between warning lamp and DTC, refer to TM-50, "DTC Index".

SHUTOFF CONDITION

Erase DTC

## Electric Shift Warning Message

*INFOID:0000000010119551*

DESIGN/PURPOSE

Electric Shift Warning A

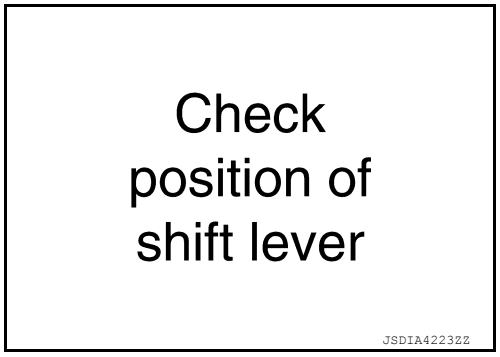
This message warns the driver that electric shift system is not normal.


Electric Shift Warning B

This message warns the driver that electric shift system is not normal.


Shift Position Warning

This message informs the driver that the selector lever is in between positions.




## SYNCHRONIZATION WITH MASTER WARNING LAMP

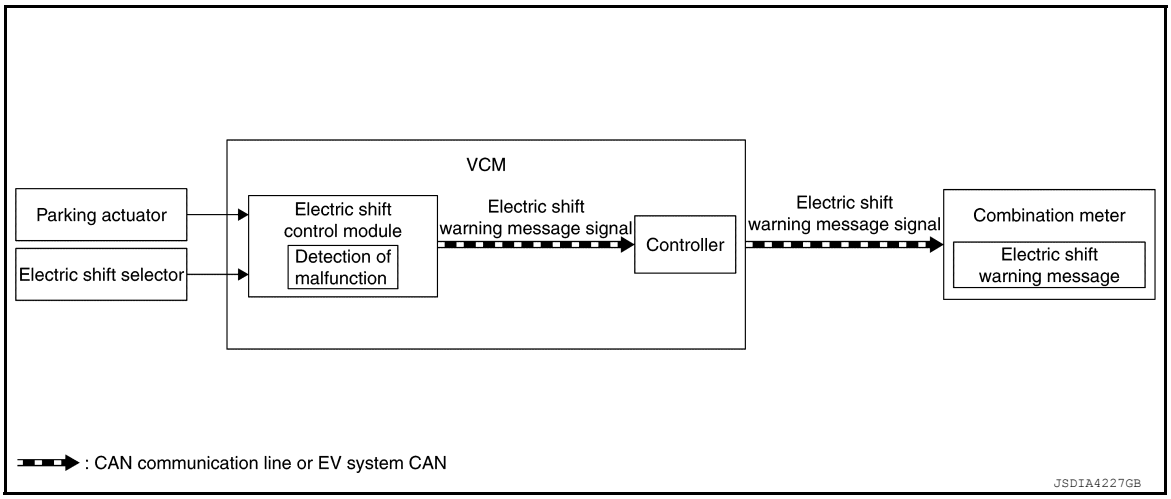
Applicable

Refer to MWI-31, "MASTER WARNING LAMP : System Description" for details of master warning lamp.

## OPERATION AT COMBNATION METER CNA COMMUNICATION CUT-OFF OR UNUSUAL SIGNAL

For actions on CAN communications blackout in the combination meter, refer to MWI-64, "Fail-Safe".

## SYSTEM DIAGRAM



SIGNAL PATH

- The electric shift control module transmits an electric shift warning lamp signal to the controller of VCM when detecting a malfunction in the electric shift system.
- VCM transmits that signal to combination meter.
- The combination meter indicates the each message when receiving an electric shift warning message signal.

WARNING/INDICATOR OPERATIONG CONDITION

Electric Shift Warning A
When the electric shift system detects DTC of master warning lamp (red).

Electric Shift Warning B
When the electric shift system detects DTC of master warning lamp (yellow).

Shift Position Warning
When selector lever is in between positions for 1 second.

WARNING/INDICATOR CANCEL CONDITION

Electric Shift Warning A
When any of the following conditions are satisfied.

- Erase DTC
- After operating the parking brake with the power switch ON, turn OFF the power switch.

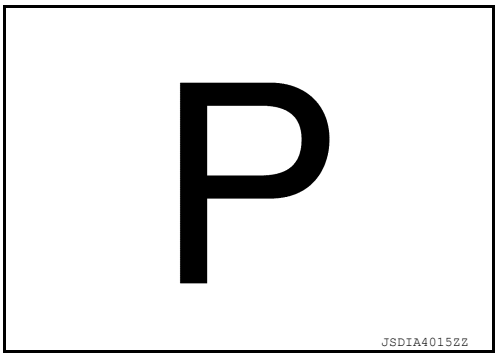
Electric Shift Warning B
Erase DTC

Shift Position Warning
Optimizing selector lever position

## Shift Position Indicator

INFOID:0000000010119552

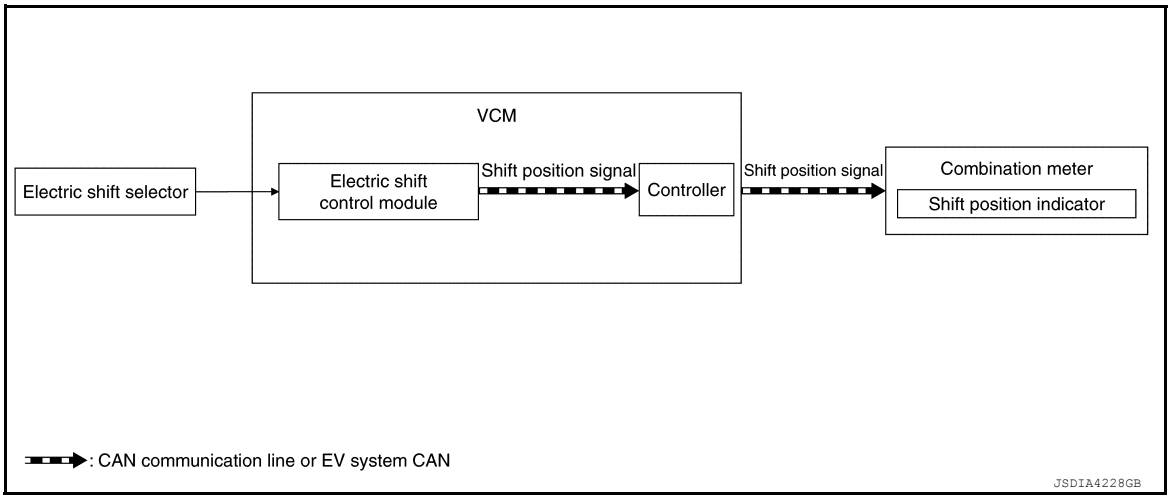
DESIGN/PURPOSE
The shift position indicator displays the shift position of transmission.




SYNCHRONIZATION WITH MASTER WARNING LAMP
Not applicable

OPERATION AT COMBNATION METER CNA COMMUNICATION CUT-OFF OR UNUSUAL SIGNAL
For actions on CAN communications blackout in the combination meter, refer to MWI-64, "Fail-Safe".

SYSTEM DIAGRAM




SIGNAL PATH

- The electric shift control module judges the shift position by the information from electric shift selector. Then electric shift control module transmits shift position signal to VCM.
- VCM transmits that signal to combination meter.
- The combination meter indicates the current shift position when receiving shift position signal.

WARNING/INDICATOR OPERATIONG CONDITION

Power switch: ON

WARNING/INDICATOR CANCEL CONDITION

Power switch: OFF

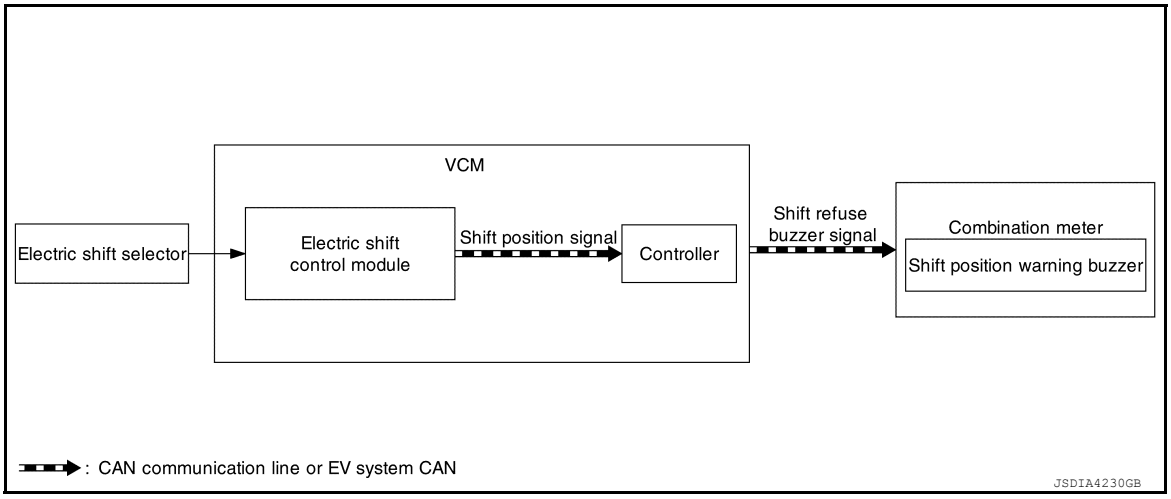
## Shift Position Warning Buzzer

INFOID:0000000010119553

PURPOSE

The shift position warning buzzer warns the driver that the sift position does not change to the selected position.

SYSTEM DIAGRAM




SIGNAL PATH

- Electric shift control module and VCM judge that the shift position can be switched according to a signal transmitted from the electric control shift selector.
- When electric shift control module and VCM judge that the shift position cannot be switched, electric shift control module transmits a shift refuse buzzer signal to the combination meter.
- When receiving a shift refuse buzzer signal, the combination meter activates the shift position warning buzzer.

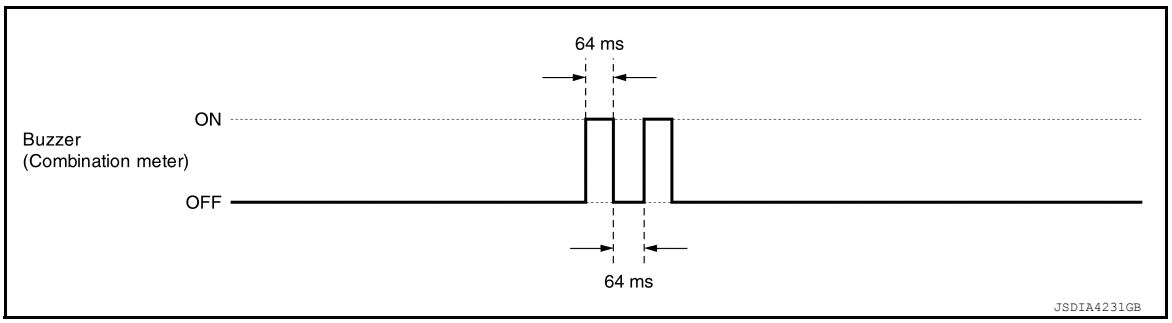
WARNING OPERATING CONDITION

When any of the following conditions are satisfied.
- When shifted from P position to other position while the power switch is ON.
- When shifted from P position to other position without depressing the brake pedal while the power switch is in READY.
- When operating the P position switch while driving at 5 km/h (4 MPH) or more.
- When shifted to R position while driving with the lever in D position.
- When shifted to D position while driving with the lever in R position.

WARNING CANCEL CONDITION

When falling outside the warning operating conditions.

SOUND SPECIFICATION



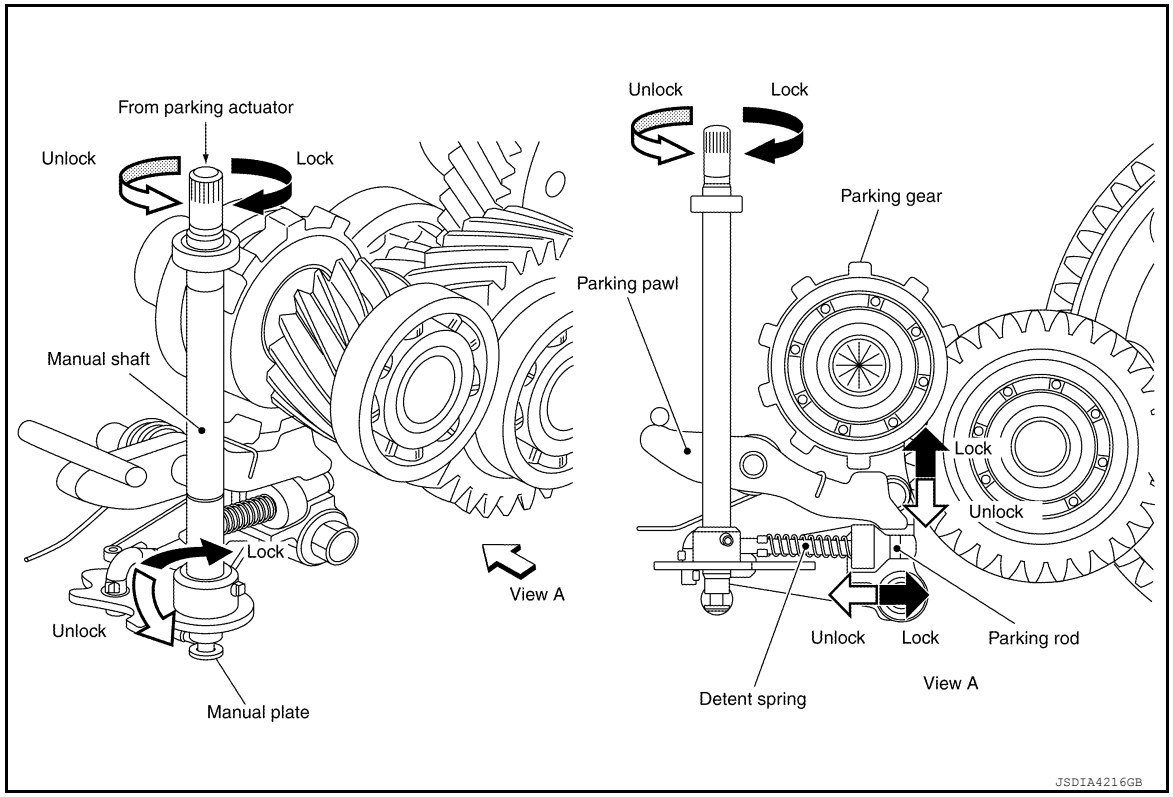
# STRUCTURE AND OPERATION

## Operating Principle

INFOID:0000000010119554

### PARKING MECHANISM

- The parking mechanism consists of the manual shaft, manual plate, detent spring, parking rod, parking pawl and parking gear, and it is locked/unlocked by the operation of the parking actuator.
- If the parking actuator is operated by the signal from the electric shift control module, the manual shaft and manual plate that is mechanically connected to the parking actuator rotates sliding the parking rod. The sliding parking rod pushes up the parking pawl, which engages with the parking gear locking the parking mechanism.

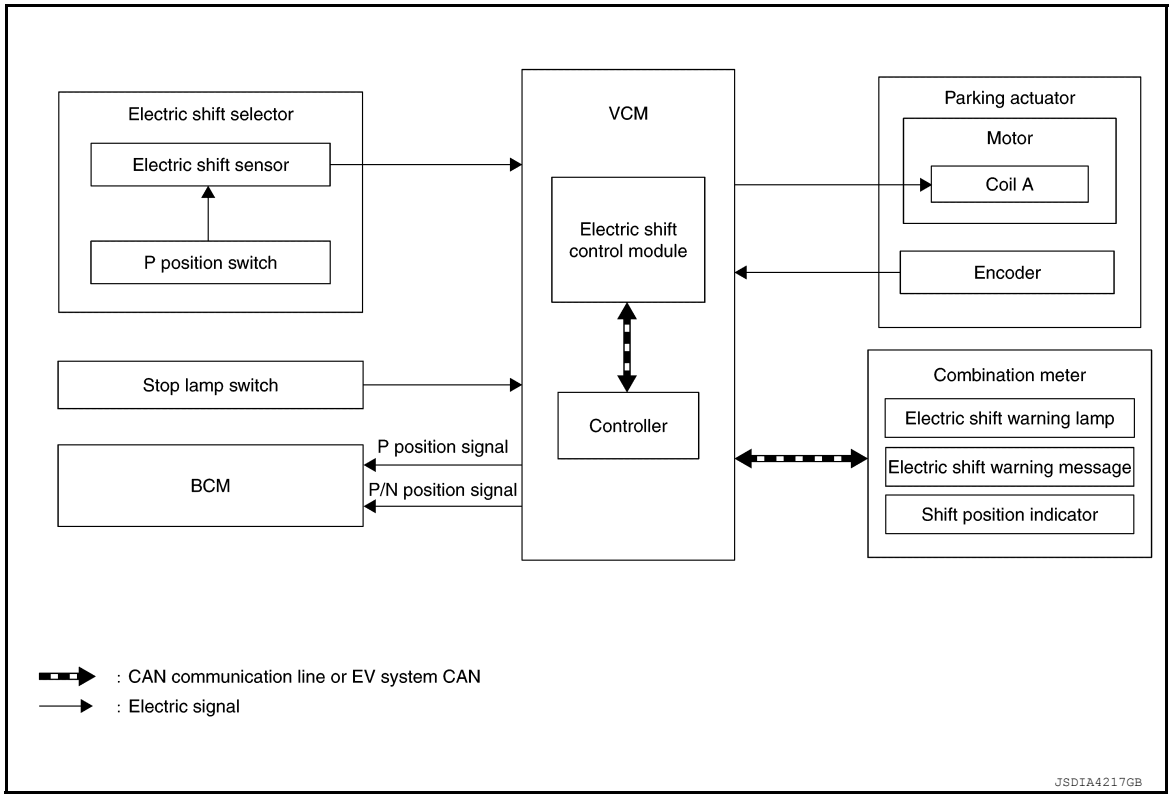


# SYSTEM
## ELECTRIC SHIFT SYSTEM
### ELECTRIC SHIFT SYSTEM : System Description

INFOID:0000000010119555

- The electric shift system detects each shift position electrically. In addition, in P position, the electric shift system activates the parking actuator, according to electrical signals received from the P position switch and brings the vehicle into the parking state.
- In the event of a malfunction in the electric shift system, the shift position indicator (in the combination meter) turns OFF and only the selector indicator (in the electric shift selector area) indicates the shift position.
- In the event of a malfunction in the electric shift system, the system enters fail-safe mode. Refer to TM-49, "Fail-Safe".

#### SYSTEM DIAGRAM




### ELECTRIC SHIFT SYSTEM : Fail-Safe

INFOID:0000000010119556

| DTC | Vehicle behavior | |
|---|---|---|
| P0571 | No impact to vehicle behavior | |
| P0705 | When shifting to the R position and the D position, the reaction becomes slower and it takes approximately 1 second to complete shifting | |
| P0706 | Shifting to the R position, N position and D position is prohibited | |
| P0780 | Malfunction in P position | Shifting from the P position to another position is prohibited |
| | Malfunction in position other than P | Shifting to the P position is prohibited |
| P1722 | No impact to vehicle behavior | |
| P1802 | Malfunction in P position | Shifting from the P position to another position is prohibited |
| | Malfunction in position other than P | Shifting to the P position is prohibited |
| P1803 | Malfunction in P position | Shifting from the P position to another position is prohibited |
| | Malfunction in position other than P | Shifting to the P position is prohibited |

| DTC | Vehicle behavior | |
|---|---|---|
| P1804 | No impact to vehicle behavior | |
| P1811 | Automatic P position system is disabled | |
| P1895 | No impact to vehicle behavior | |
| P1896 | When shifting to the R position and the D position, the reaction becomes slower and it takes approximately 1 second to complete shifting | |
| P1897 | No impact to vehicle behavior | |
| P1899 | Malfunction in P position | Shifting from the P position to another position is prohibited |
| | Malfunction in position other than P | Shifting to the P position is prohibited |
| P189A | Malfunction in P position | Shifting from the P position to another position is prohibited |
| | Malfunction in position other than P | Shifting to the P position is prohibited |
| P189D | No impact to vehicle behavior | |
| P18A3 | Malfunction in P position | Shifting from the P position to another position is prohibited |
| | Malfunction in position other than P | Shifting to the P position is prohibited |
| P18A4 | Malfunction in P position | Shifting from the P position to another position is prohibited |
| | Malfunction in position other than P | Shifting to the P position is prohibited |
| P18A7 | Shifting operation is prohibited | |
| P18A8 | Pushing the P position switch does not switch the to the P position | |
| P18A9 | Malfunction in P position | Shifting from the P position to another position is prohibited |
| | Malfunction in position other than P | Shifting to the P position is prohibited |
| P18AB | Automatic P position system may be disabled | |
| P18AC | No impact to vehicle behavior | |
| P18AE | No impact to vehicle behavior | |
| P18AF | No impact to vehicle behavior | |
| P18B0 | Malfunction in P position | Shifting from the P position to another position is prohibited |
| | Malfunction in position other than P | Shifting to the P position is prohibited |
| P18B1 | Malfunction in P position | Shifting from the P position to another position is prohibited |
| | Malfunction in position other than P | Shifting to the P position is prohibited |
| P18B2 | Malfunction in P position | Shifting from the P position to another position is prohibited |
| | Malfunction in position other than P | Shifting to the P position is prohibited |
| U1000 | EV system CAN with VCM blocked | Shifting to the R position and the D position is prohibited |
| | Other than the above | No impact to vehicle behavior |
| U1010 | Shifting to the R position and the D position is prohibited | |
| U1086 | No impact to vehicle behavior | |

## ELECTRIC SHIFT SYSTEM : Protection Control

INFOID:0000000010119557

If shifting from the P position to another position and shifting from another position to the P position are repeated within a short period of time, it may become impossible to shift for system protection. In this case, the system automatically returns to the normal state allowing shifting after approximately 10 seconds.

# WARNING/INDICATOR/CHIME LIST

## WARNING/INDICATOR/CHIME LIST : Warning Lamp/Indicator Lamp

INFOID:0000000010119558

| Name | Design | Arrangement/Function |
|---|---|---|
| Electric shift warning lamp |  | Regarding the arrangement. Refer to MWI-6, "METER SYSTEM : Combination Meter". |
| | | Regarding the function. Refer to TM-35, "Electric Shift Warning Lamp". |

| Name | Design | Arrangement/Function |
|---|---|---|
| Master warning lamp |  | Regarding the arrangement. Refer to MWI-6, "METER SYSTEM : Combination Meter".<br>Regarding the function. Refer to MWI-31, "MASTER WARNING LAMP : System Description". |

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

INFOID:0000000010119559

| Name | Function |
|---|---|
| Shift position indicator | Refer to TM-38, "Shift Position Indicator". |
| Electric shift warning message | Refer to TM-36, "Electric Shift Warning Message". |

## WARNING/INDICATOR/CHIME LIST : Warning Chime

INFOID:0000000010119560

| Name | Function |
|---|---|
| Shift position warning buzzer | Refer to TM-39, "Shift Position Warning Buzzer". |

# DIAGNOSIS SYSTEM (ELECTRIC SHIFT)

## DIAGNOSIS DESCRIPTION

### DIAGNOSIS DESCRIPTION : System Description

INFOID:0000000010119561

This is an on-board trouble diagnosis system which automatically detects malfunction. Detected malfunction is memorized in ECU as DTC. Diagnosis information can be confirmed using CONSULT.

### DIAGNOSIS DESCRIPTION : DTC

INFOID:0000000010119562

- DTC (P0571, P0705, P0780, etc.) is specified by SAE J2012/ISO 15031-6.
- Electric shift control module memorizes DTC when malfunction is detected. It can memorize plural DTCs.

### DIAGNOSIS DESCRIPTION : Counter System

INFOID:0000000010119563

Counter system counts up at every operation of power switch from OFF to ON under condition that the same malfunction is not detected. On the other hand, if the same DTC as memorized one is detected again, the count is reset and the counter system counts up again from “0”.

### CONSULT Function

INFOID:0000000010119564

#### APPLICABLE ITEMS

| Mode | Function description |
|---|---|
| All DTC Reading | Display all DTCs or diagnostic items that all ECUs are recording and judging |
| Self Diagnostic Results | Retrieve DTC from ECU and display diagnostic items. |
| Data Monitor | Monitor the input/output signal of the control unit in real time. |
| CAN Diagnosis | This mode displays a network diagnosis result about CAN by diagram. |
| CAN Diagnosis Support Monitor | It monitors the status of CAN communication. |
| ECU Identification | Display the ECU identification number (part number etc.) of the selected system. |

#### SELF DIAGNOSTIC RESULTS

Display Item List
Refer to TM-50, "DTC Index".

How to Read DTC
DTC is displayed on “Self Diagnostic results” of CONSULT.
When DTC is currently detected, “CRNT” is displayed. If “PAST” is displayed, it shows a malfunction occurred in the past.The trip number of drive without malfunction of concerned DTC can be confirmed with “IGN counter” inside “FFD”.

How to Erase DTC
**NOTE:**
If the power switch is kept ON after repair operation, operate the power switch to OFF. Operate the power switch to ON again after waiting at least 10 seconds.
1. Touch “SHIFT” of CONSULT.
2. Touch “Self Diagnostic Result”.
3. Touch “Erase”. (DTC memorized in electric shift control module is erased.)

IGN Counter
IGN counter is displayed in “FFD”. It displays the number of operations of power switch from OFF to ON after DTC recovery to normal.
- If malfunction (DTC) is currently detected, “0” is displayed.
- The displayed number counts up at each operation of power switch from OFF to ON after recovery to normal, such as 1 → 2 → 3...38 → 39.
- If the number of operation exceeds 39, the displayed number will be fixed at “39” until the self diagnosis result is erased.

#### DATA MONITOR

| Monitored item (Unit) | Remarks |
|---|---|
| SHIFT SENSOR 1 | Displays the signal value of electric shift sensor No. 1 |
| SHIFT SENSOR 2 | Displays the signal value of electric shift sensor No. 2 |
| SHIFT SENSOR 3 | Displays the signal value of electric shift sensor No. 3 |
| SHIFT SENSOR 4 | Displays the signal value of electric shift sensor No. 4 |
| SHIFT SENSOR 5 | Displays the signal value of electric shift sensor No. 5 |
| SHIFT SENSOR 6 | Displays the signal value of electric shift sensor No. 6 |
| P POSITION SWITCH 1 | Displays the signal value of P position switch No. 1 |
| P POSITION SWITCH 2 | Displays the signal value of P position switch No. 2 |
| BRAKE SWITCH | Displays the signal value of the stop lamp switch. |
| PARKING ACTUATOR RELAY A | Displays the command value from the electric shift control module to parking actuator relay A |
| P/N POSITION CONDITION | Displays the P position and N position status recognized by the electric shift control module |
| NOT P POSITION CONDITION | Displays a status other than the P position recognized by the electric shift control module |
| IGNITION SWITCH | Displays the input status of the power switch |
| BRAKE SWITCH (CAN) | Displays the signal value of the stop lamp switch received from VCM |
| MAIN POWER VOLTAGE (V) | Monitors the voltage value of the main power supply for the electric shift control module and displays the monitored value |
| MOTOR A U VOLTAGE (V) | Displays the motor A U-phase terminal voltage A/D converted value |
| MOTOR A V VOLTAGE (V) | Displays the motor A V-phase terminal voltage A/D converted value |
| MOTOR A W VOLTAGE (V) | Displays the motor A W-phase terminal voltage A/D converted value |
| RANGE POSITION | Displays the position recognized by the electric shift control module |
| SHIFT POSITION JUDGMENT | Displays the shift input position recognized by the electric shift control module |
| TARGET SHIFT POSITION | Displays the target shift position recognized by the electric shift control module |
| ECO MODE REQUEST | Displays the ECO mode status recognized by the electric shift control module |
| ACTUAL P POSITION | Displays the P position status recognized by the electric shift control module |
| VEHICLE SPEED (VDC) (km/h or mph) | Displays the signal value of the vehicle speed received from ABS actuator control unit |
| VEHICLE SPEED (VCM) (km/h or mph) | Displays the vehicle speed signal value received from VCM |
| E-SHIFT WARNING LAMP | Displays the electric shift warning lamp signal status transmitted from the electric shift control module |
| E-SHIFT WARNING MSG | Displays the master warning message status transmitted from the electric shift control module |
| ECU POWER 1 (V) | Monitors the power supply of electric shift control module and displays the monitored value |
| ECU POWER 2 (V) | Monitors the power supply of electric shift control module and displays the monitored value |
| SHIFT SENSOR 1 VOLTAGE (V) | Displays the voltage value of electric shift sensor No. 1 |
| SHIFT SENSOR 2 VOLTAGE (V) | Displays the voltage value of electric shift sensor No. 2 |
| SHIFT SENSOR 3 VOLTAGE (V) | Displays the voltage value of electric shift sensor No. 3 |
| SHIFT SENSOR 4 VOLTAGE (V) | Displays the voltage value of electric shift sensor No. 4 |
| SHIFT SENSOR 5 VOLTAGE (V) | Displays the voltage value of electric shift sensor No. 5 |
| SHIFT SENSOR 6 VOLTAGE (V) | Displays the voltage value of electric shift sensor No. 6 |
| P POSITION SW 1 VOLTAGE (V) | Displays the voltage value of P position switch No. 1 |
| P POSITION SW 2 VOLTAGE (V) | Displays the voltage value of P position switch No. 2 |

# ECU DIAGNOSIS INFORMATION

## ELECTRIC SHIFT CONTROL MODULE

### Reference Value

INFOID:0000000010119565

#### CONSULT DATA MONITOR STANDARD VALUE

| Monitor item | Condition | Value / Status (Approx.) |
|---|---|---|
| SHIFT SENSOR 1 | Selector lever is held in R position | ON |
| | Other than the above | OFF |
| SHIFT SENSOR 2 | Selector lever is held in R and N positions | ON |
| | Other than the above | OFF |
| SHIFT SENSOR 3 | Selector lever is held in H (Home) and N positions | ON |
| | Other than the above | OFF |
| SHIFT SENSOR 4 | Selector lever is held in N and D positions | ON |
| | Other than the above | OFF |
| SHIFT SENSOR 5 | Selector lever is held in D position | ON |
| | Other than the above | OFF |
| SHIFT SENSOR 6 | Selector lever in H (Home) position | ON |
| | Other than the above | OFF |
| P POSITION SWITCH 1 | P position switch is pushed | ON |
| | Other than the above | OFF |
| P POSITION SWITCH 2 | P position switch is pushed | OFF |
| | Other than the above | ON |
| BRAKE SWITCH | Brake pedal is depressed | ON |
| | Brake pedal is released | OFF |
| PARKING ACTUATOR RELAY A | Power switch is ON | ON |
| P/N POSITION CONDITION | Selector lever in P and N positions | ON |
| | Other than the above | OFF |
| NOT P POSITION CONDITION | Selector lever in P position | OFF |
| | Other than the above | ON |
| IGNITION SWITCH | Power switch is ON | ON |
| BRAKE SWITCH (CAN) | Brake pedal is depressed | ON |
| | Brake pedal is released | OFF |
| MAIN POWER VOLTAGE | Power switch is ON | 9 – 16 V |
| MOTOR A U VOLTAGE | No shifting | 9 – 16 V |
| MOTOR A V VOLTAGE | No shifting | 9 – 16 V |
| MOTOR A W VOLTAGE | No shifting | 9 – 16 V |
| RANGE POSITION | Selector lever in P position | P |
| | Selector lever in R position | R |
| | Selector lever in N position | N |
| | Selector lever in D position | D |
| SHIFT POSITION JUDGMENT | Selector lever in P position | P |
| | Selector lever in R position | R |
| | Selector lever in N position | N |
| | Selector lever in D position | D |

| Monitor item | Condition | Value / Status (Approx.) |
|---|---|---|
| TARGET SHIFT POSITION | Selector lever in P position | P |
| | Selector lever in R position | R |
| | Selector lever in N position | N |
| | Selector lever in D position | D |
| ECO MODE REQUEST | During ECO mode driving | ECO |
| | Other than the above | NORML |
| ACTUAL P POSITION | Selector lever in P position | P |
| | Other than the above | NOT P |
| VEHICLE SPEED (VDC) | During driving | Almost same as the speedometer display |
| VEHICLE SPEED (VCM) | During driving | Almost same as the speedometer display |
| E-SHIFT WARNING LAMP | Electric shift warning lamp: ON | ON |
| | Electric shift warning lamp: OFF | OFF |
| E-SHIFT WARNING MSG | Warning message is not displayed | — |
| | Warning message:<br>“When Parked Apply Parking Brake” | MSG1 |
| | Warning message:<br>“T/M system malfunction visit dealer” | MSG2 |
| | Warning message:<br>“Check position of shift lever” | MSG3 |
| ECU POWER 1 | Power switch is ON | 9 – 16 V |
| ECU POWER 2 | Power switch is ON | 9 – 16 V |
| SHIFT SENSOR 1 VOLTAGE | Selector lever is held in R and N positions | 9 – 16 V |
| | Other than the above | 0 V |
| SHIFT SENSOR 2 VOLTAGE | Selector lever is held in H (Home) and N positions | 9 – 16 V |
| | Other than the above | 0 V |
| SHIFT SENSOR 3 VOLTAGE | Selector lever is held in N and D positions | 9 – 16 V |
| | Other than the above | 0 V |
| SHIFT SENSOR 4 VOLTAGE | Selector lever is held in D position | 9 – 16 V |
| | Other than the above | 0 V |
| SHIFT SENSOR 5 VOLTAGE | Selector lever in H (Home) position | 9 – 16 V |
| | Other than the above | 0 V |
| SHIFT SENSOR 6 VOLTAGE | Selector lever is held in R and N positions | 9 – 16 V |
| | Other than the above | 0 V |
| P POSITION SW 1 VOLTAGE | P position switch is pushed | 9 – 16 V |
| | Other than the above | 0 V |
| P POSITION SW 2 VOLTAGE | P position switch is pushed | 0 V |
| | Other than the above | 9 – 16 V |

## TERMINAL LAYOUT

Refer to EVC-84, "Reference Value".

## PHYSICAL VALUES

Refer to EVC-84, "Reference Value".

## Fail-Safe

INFOID:0000000010119566

| DTC | Vehicle behavior | |
|---|---|---|
| P0571 | No impact to vehicle behavior | |
| P0705 | When shifting to the R position and the D position, the reaction becomes slower and it takes approximately 1 second to complete shifting | |
| P0706 | Shifting to the R position, N position and D position is prohibited | |
| P0780 | Malfunction in P position | Shifting from the P position to another position is prohibited |
| | Malfunction in position other than P | Shifting to the P position is prohibited |
| P1722 | No impact to vehicle behavior | |
| P1802 | Malfunction in P position | Shifting from the P position to another position is prohibited |
| | Malfunction in position other than P | Shifting to the P position is prohibited |
| P1803 | Malfunction in P position | Shifting from the P position to another position is prohibited |
| | Malfunction in position other than P | Shifting to the P position is prohibited |
| P1804 | No impact to vehicle behavior | |
| P1811 | Automatic P position system is disabled | |
| P1895 | No impact to vehicle behavior | |
| P1896 | When shifting to the R position and the D position, the reaction becomes slower and it takes approximately 1 second to complete shifting | |
| P1897 | No impact to vehicle behavior | |
| P1899 | Malfunction in P position | Shifting from the P position to another position is prohibited |
| | Malfunction in position other than P | Shifting to the P position is prohibited |
| P189A | Malfunction in P position | Shifting from the P position to another position is prohibited |
| | Malfunction in position other than P | Shifting to the P position is prohibited |
| P189D | No impact to vehicle behavior | |
| P18A3 | Malfunction in P position | Shifting from the P position to another position is prohibited |
| | Malfunction in position other than P | Shifting to the P position is prohibited |
| P18A4 | Malfunction in P position | Shifting from the P position to another position is prohibited |
| | Malfunction in position other than P | Shifting to the P position is prohibited |
| P18A7 | Shifting operation is prohibited | |
| P18A8 | Pushing the P position switch does not switch the to the P position | |
| P18A9 | Malfunction in P position | Shifting from the P position to another position is prohibited |
| | Malfunction in position other than P | Shifting to the P position is prohibited |
| P18AB | Automatic P position system may be disabled | |
| P18AC | No impact to vehicle behavior | |
| P18AE | No impact to vehicle behavior | |
| P18AF | No impact to vehicle behavior | |
| P18B0 | Malfunction in P position | Shifting from the P position to another position is prohibited |
| | Malfunction in position other than P | Shifting to the P position is prohibited |
| P18B1 | Malfunction in P position | Shifting from the P position to another position is prohibited |
| | Malfunction in position other than P | Shifting to the P position is prohibited |
| P18B2 | Malfunction in P position | Shifting from the P position to another position is prohibited |
| | Malfunction in position other than P | Shifting to the P position is prohibited |
| U1000 | EV system CAN with VCM blocked | Shifting to the R position and the D position is prohibited |
| | Other than the above | No impact to vehicle behavior |

| DTC | Vehicle behavior |
|---|---|
| U1010 | Shifting to the R position and the D position is prohibited |
| U1086 | No impact to vehicle behavior |

## Protection Control

INFOID:0000000010119567

If shifting from the P position to another position and shifting from another position to the P position are repeated within a short period of time, it may become impossible to shift for system protection. In this case, the system automatically returns to the normal state allowing shifting after approximately 10 seconds.

## DTC Inspection Priority Chart

INFOID:0000000010119568

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

| Priority | Detected items (DTC) | Reference |
|---|---|---|
| 1 | P0706 TRANSMISSION RANGE SENSOR A | TM-71 |
| | P0780 SHIFT ERROR | TM-74 |
| | P1802 CONTROL MODULE | TM-77 |
| | P1803 CONTROL MODULE | TM-78 |
| | P1897 ENCODER ERROR | TM-86 |
| | P18A3 CONTROL MODULE | TM-95 |
| | P18A4 CONTROL MODULE | TM-96 |
| | P18A7 SHIFT SIGNAL OFF | TM-97 |
| | P18A8 P POSITION SWITCH | TM-101 |
| | P18A9 PARKING ACTUATOR FUNCTION | TM-103 |
| | P18AB IGNITION SWITCH | TM-104 |
| 2 | P0571 BRAKE SWITCH A | TM-66 |
| | P0705 TRANSMISSION RANGE SENSOR A | TM-68 |
| | P1722 VEHICLE SPEED | TM-75 |
| | P1804 CONTROL MODULE | TM-79 |
| | P1811 ELECTRIC SHIFT POWER SUPPLY RELAY | TM-80 |
| | P1895 MOTOR SPEED | TM-81 |
| | P1896 SHIFT POWER SUPPLY | TM-82 |
| | P1899 MOTOR A | TM-88 |
| | P189A MOTOR A | TM-90 |
| | P189D BACK UP VOLTAGE | TM-93 |
| | P18AC PARKING ACTUATOR RELAY A | TM-106 |
| | P18AE STUCK IN SHIFT | TM-108 |
| | P18AF CONTROL MODULE | TM-109 |
| | P18B0 CONTROL MODULE | TM-110 |
| | P18B1 CONTROL MODULE | TM-111 |
| | P18B2 CONTROL MODULE | TM-112 |
| | U1000 CAN COMM CIRCUIT | TM-113 |
| | U1010 CONTROL UNIT (CAN) | TM-114 |
| | U1086 CAN ERROR | TM-115 |

## DTC Index

INFOID:0000000010119569

**NOTE:**

If some DTCs are displayed at the same time, perform inspections one by one based on the priority as per the following list. Refer to TM-50, "DTC Inspection Priority Chart".

○: ON

| DTC*1 CONSULT | Item name (CONSULT screen terms) | Electric shift warning lamp*2 | Master warning lamp*3 Yellow | Master warning lamp*3 Red | Electric shift warning message*4 type | Reference |
|---|---|---|---|---|---|---|
| P0571 | BRAKE SWITCH A | — | ○ | — | B | TM-66 |
| P0705 | TRANSMISSION RANGE SENSOR A | — | ○ | — | B | TM-68 |
| P0706 | TRANSMISSION RANGE SENSOR A | ○ (Vehicle stopped) | ○ (During driving) | ○ (After stop) | During driving: B After stop: A | TM-71 |
| P0780 | SHIFT ERROR | ○ | — | ○ | A | TM-74 |
| P1722 | VEHICLE SPEED | — | ○ | — | B | TM-75 |
| P1802 | CONTROL MODULE | ○ | — | ○ | A | TM-77 |
| P1803 | CONTROL MODULE | ○ | — | ○ | A | TM-78 |
| P1804 | CONTROL MODULE | ○ | — | ○ | A | TM-79 |
| P1811 | ELECTRIC SHIFT POWER SUPPLY RELAY | ○ (Vehicle stopped) | ○ (During driving) | ○ (After stop) | During driving: B After stop: A | TM-80 |
| P1895 | MOTOR SPEED | — | ○ | — | B | TM-81 |
| P1896 | SHIFT POWER SUPPLY | — | ○ | — | B | TM-82 |
| P1897 | ENCODER ERROR | ○ (Vehicle stopped) | ○ (During driving) | ○ (After stop) | During ready: B Other than ready: A | TM-86 |
| P1899 | MOTOR A | ○ | — | ○ | A | TM-88 |
| P189A | MOTOR A | ○ (Vehicle stopped) | ○ (During driving) | ○ (After stop) | During driving: B After stop: A | TM-90 |
| P189D | BACK UP VOLTAGE | — | ○ | — | B | TM-93 |
| P18A3 | CONTROL MODULE | ○ | — | ○ | A | TM-95 |
| P18A4 | CONTROL MODULE | ○ | — | ○ | A | TM-96 |
| P18A7 | SHIFT SIGNAL OFF | ○ (Vehicle stopped) | ○ (During driving) | ○ (After stop) | During driving: B After stop: A | TM-97 |
| P18A8 | P POSITION SWITCH | ○ (Vehicle stopped) | ○ (During driving) | ○ (After stop) | During driving: B After stop: A | TM-101 |
| P18A9 | PARKING ACTUATOR FUNCTION | ○ | — | ○ | A | TM-103 |
| P18AB | IGNITION SWITCH | ○ (Vehicle stopped) | ○ (During driving) | ○ (After stop) | During driving: B After stop: A | TM-104 |
| P18AC | PARKING ACTUATOR RELAY A | — | ○ | — | B | TM-106 |
| P18AE | STUCK IN SHIFT | — | ○ | — | B | TM-108 |
| P18AF | CONTROL MODULE | — | ○ | — | B | TM-109 |
| P18B0 | CONTROL MODULE | ○ (Vehicle stopped) | ○ (During driving) | ○ (After stop) | During driving: B After stop: A | TM-110 |

| DTC*1 | Item name (CONSULT screen terms) | Electric shift warning lamp*2 | Master warning lamp*3 | | Electric shift warning message*4 type | Reference |
|---|---|---|---|---|---|---|
| CONSULT | | | Yellow | Red | | |
| P18B1 | CONTROL MODULE | ○ | — | ○ | A | TM-111 |
| P18B2 | CONTROL MODULE | ○ | — | ○ | A | TM-112 |
| U1000 | CAN COMM CIRCUIT | — | ○ | — | B | TM-113 |
| U1010 | CONTROL UNIT (CAN) | — | ○ | — | B | TM-114 |
| U1086 | CAN ERROR | — | ○ | — | B | TM-115 |

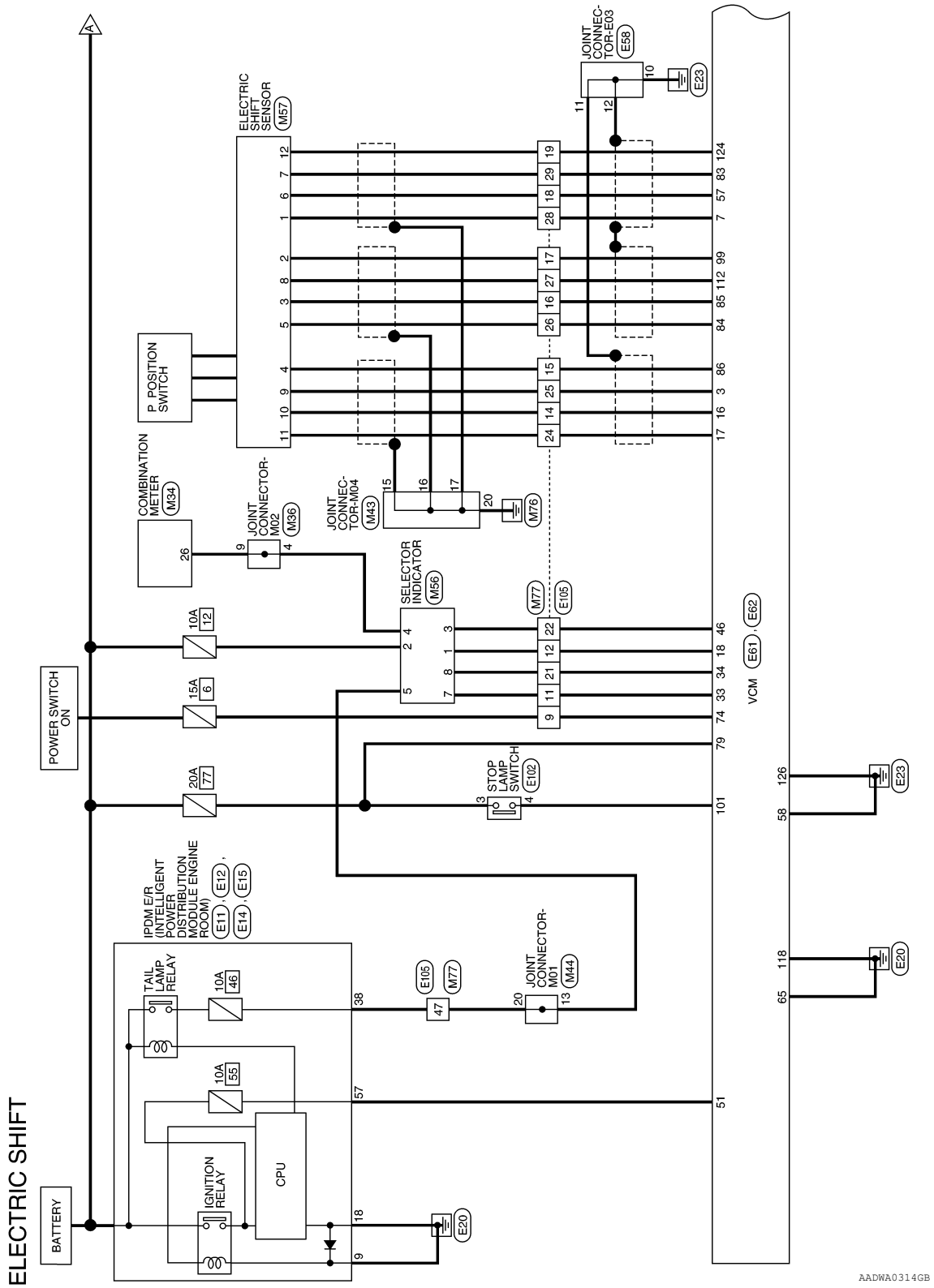
*1: These numbers are prescribed by SAE J2012/ISO 15031-6.
*2: Refer to TM-35, "Electric Shift Warning Lamp".
*3: Refer to MWI-31, "MASTER WARNING LAMP : System Description".
*4: Refer to TM-36, "Electric Shift Warning Message".

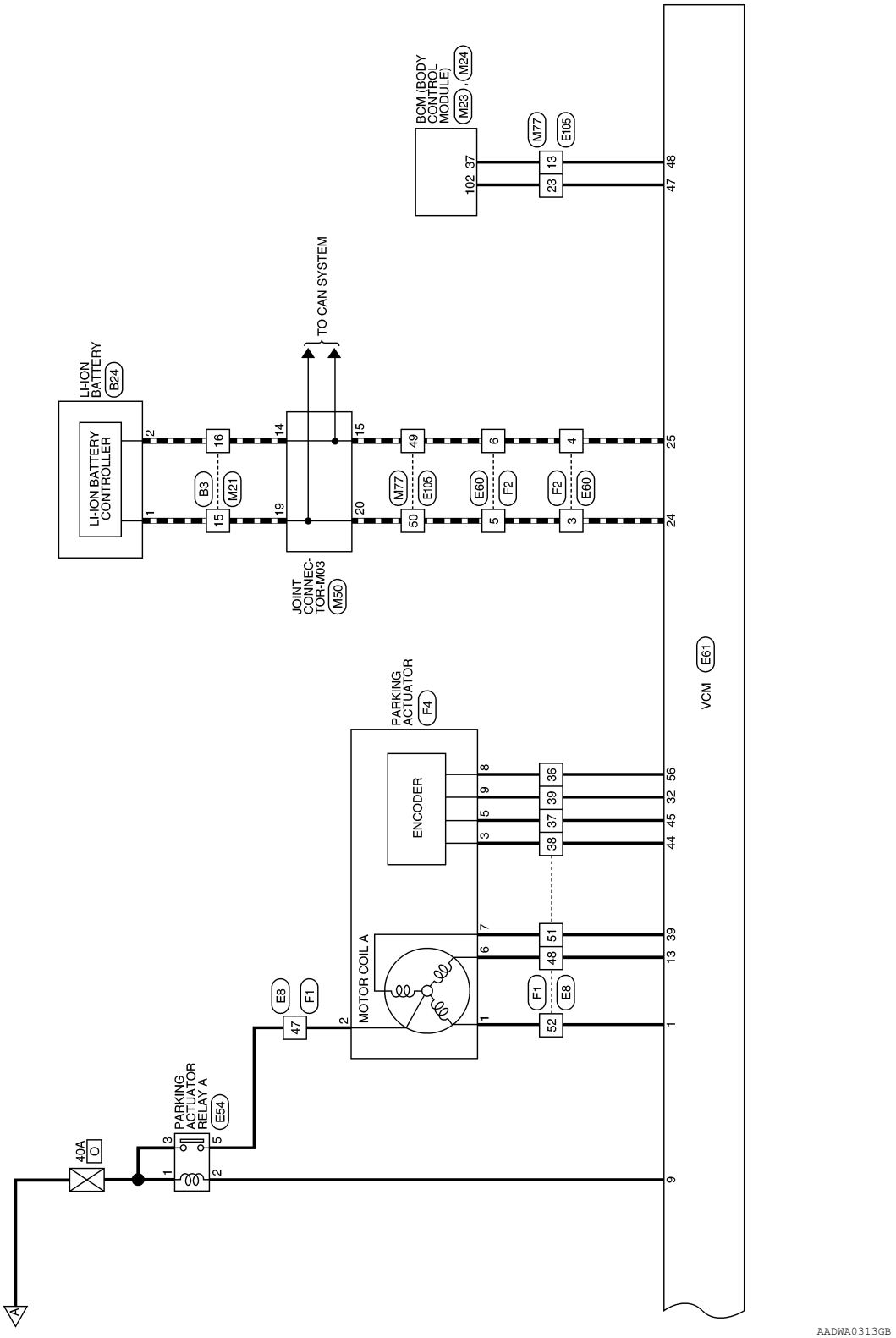
# WIRING DIAGRAM

## ELECTRIC SHIFT SYSTEM

### Wiring Diagram

INFOID:0000000010119570




BCM (BODY CONTROL MODULE)
M23, M24
M77
E105
TO CAN SYSTEM
LI-ION BATTERY
B24
LI-ION BATTERY CONTROLLER
JOINT CONNEC-TOR-M03
M50
PARKING ACTUATOR
F4
ENCODER
MOTOR COIL A
VCM
E61
40A
PARKING ACTUATOR RELAY A
E54
E8
F1
E60
F2
M21
B3
A
AADWA0313GB

## ELECTRIC SHIFT SYSTEM CONNECTORS

| Connector No. | M21 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Color | WHITE |

H.S.

| 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 32 | 31 | 30 | 29 | 28 | 27 | 26 | 25 | 24 | 23 | 22 | 21 | 20 | 19 | 18 | 17 |

| Terminal No. | Color of Wire | Signal Name |
|---|---|---|
| 15 | L | – |
| 16 | G | – |

| Connector No. | M23 |
|---|---|
| Connector Name | BCM (BODY CONTROL MODULE) |
| Connector Color | WHITE |

H.S.

| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 | 101 | 102 | 103 | 104 | 105 | 106 | 107 | 108 | 109 | 110 |

| Terminal No. | Color of Wire | Signal Name |
|---|---|---|
| 102 | BG | – |

| Connector No. | M24 |
|---|---|
| Connector Name | BCM (BODY CONTROL MODULE) |
| Connector Color | WHITE |

H.S.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |

| Terminal No. | Color of Wire | Signal Name |
|---|---|---|
| 37 | V | – |

| Connector No. | M43 |
|---|---|
| Connector Name | JOINT CONNECTOR-M04 |
| Connector Color | GRAY |

H.S.

| 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|---|---|
| 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 |

| Terminal No. | Color of Wire | Signal Name |
|---|---|---|
| 15 | B | – |
| 16 | B | – |
| 17 | B | – |
| 20 | B | – |

| Connector No. | M36 |
|---|---|
| Connector Name | JOINT CONNECTOR-M02 |
| Connector Color | GRAY |

H.S.

| 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|---|---|
| 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 |

| Terminal No. | Color of Wire | Signal Name |
|---|---|---|
| 4 | B | – |
| 9 | B | – |

| Connector No. | M34 |
|---|---|
| Connector Name | COMBINATION METER |
| Connector Color | WHITE |

H.S.

| 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 40 | 39 | 38 | 37 | 36 | 35 | 34 | 33 | 32 | 31 | 30 | 29 | 28 | 27 | 26 | 25 | 24 | 23 | 22 | 21 |

| Terminal No. | Color of Wire | Signal Name |
|---|---|---|
| 26 | B | – |

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| Connector No. | M44 |
|---|---|
| Connector Name | JOINT CONNECTOR-M01 |
| Connector Color | GRAY |

H.S.

| 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|---|---|
| 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 |

| Terminal No. | Color of Wire | Signal Name |
|---|---|---|
| 13 | W | – |
| 20 | W | – |

| Connector No. | M50 |
|---|---|
| Connector Name | JOINT CONNECTOR-M03 |
| Connector Color | PINK |

H.S.

| 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|---|---|
| 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 |

| Terminal No. | Color of Wire | Signal Name |
|---|---|---|
| 14 | G | – |
| 15 | G | – |
| 19 | L | – |
| 20 | L | – |

| Connector No. | M56 |
|---|---|
| Connector Name | SELECTOR INDICATOR |
| Connector Color | WHITE |

H.S.

| 1 | 2 | 3 | 4 |
|---|---|---|---|
| 5 | 6 | 7 | 8 |

| Terminal No. | Color of Wire | Signal Name |
|---|---|---|
| 1 | Y | – |
| 2 | R | – |
| 3 | B | – |
| 4 | B | – |
| 5 | W | – |
| 7 | L | – |
| 8 | P | – |

| Connector No. | M57 |
|---|---|
| Connector Name | ELECTRONIC SHIFT SENSOR |
| Connector Color | WHITE |

H.S.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| 7 | 8 | 9 | 10 | 11 | 12 |

| Terminal No. | Color of Wire | Signal Name |
|---|---|---|
| 1 | B | – |
| 2 | R | – |
| 3 | W | – |
| 4 | G | |

| Terminal No. | Color of Wire | Signal Name |
|---|---|---|
| 5 | G | – |
| 6 | G | – |
| 7 | R | – |
| 8 | B | – |
| 9 | W | – |
| 10 | R | – |
| 11 | B | – |
| 12 | W | – |

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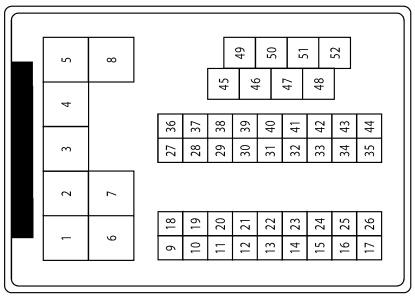
| Connector No. | E8 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Color | BLACK |

H.S.

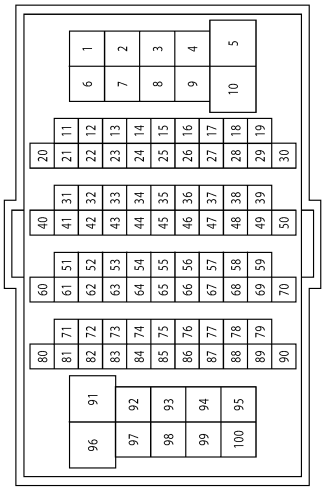



| Terminal No. | Color of Wire | Signal Name |
|---|---|---|
| 36 | G | – |
| 37 | V | – |
| 38 | P | – |
| 39 | B | – |
| 47 | G | – |
| 48 | SB | – |
| 51 | R | – |
| 52 | B | – |

| Terminal No. | Color of Wire | Signal Name |
|---|---|---|
| 18 | G | – |
| 19 | W | – |
| 21 | P | – |
| 22 | B | – |
| 23 | BG | – |
| 24 | B | – |
| 25 | W | – |
| 26 | G | – |
| 27 | B | – |
| 28 | B | – |
| 29 | R | – |
| 47 | W | – |
| 49 | G | – |
| 50 | L | – |

| Connector No. | M77 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Color | WHITE |

H.S.




| Terminal No. | Color of Wire | Signal Name |
|---|---|---|
| 9 | G | – |
| 11 | L | – |
| 12 | Y | – |
| 13 | V | – |
| 14 | R | – |
| 15 | G | – |
| 16 | W | – |
| 17 | R | – |

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| Connector No. | E11 |
|---|---|
| Connector Name | IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) |
| Connector Color | BLACK |

H.S.

| 11 | 10 | 9 |
|---|---|---|
| 14 | 13 | 12 |

| Terminal No. | Color of Wire | Signal Name |
|---|---|---|
| 9 | B | POWER GROUND |

| Connector No. | E12 |
|---|---|
| Connector Name | IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) |
| Connector Color | BROWN |

H.S.

| 17 | 16 | 15 |
|---|---|---|
| 22 | 21 | 20 | 19 | 18 |

| Terminal No. | Color of Wire | Signal Name |
|---|---|---|
| 18 | B | SGND |

| Connector No. | E14 |
|---|---|
| Connector Name | IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) |
| Connector Color | BROWN |

H.S.

| 39 | 38 | 37 | 36 | 35 |
|---|---|---|---|---|
| 46 | 45 | 44 | 43 | 42 | 41 | 40 |

| Terminal No. | Color of Wire | Signal Name |
|---|---|---|
| 38 | R | TAIL 1 (WITH SOLAR CELL) |
| 38 | LG | TAIL 1 (WITHOUT SOLAR CELL) |

| Connector No. | E15 |
|---|---|
| Connector Name | IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) |
| Connector Color | WHITE |

H.S.

| 53 | 52 | 51 | 50 | 49 | 48 | 47 |
|---|---|---|---|---|---|---|
| 62 | 61 | 60 | 59 | 58 | 57 | 56 | 55 | 54 |

| Terminal No. | Color of Wire | Signal Name |
|---|---|---|
| 57 | R | A/T ECU IGN |

| Connector No. | E54 |
|---|---|
| Connector Name | PARKING ACTUATOR RELAY A |
| Connector Color | BLUE |

H.S.

| 3 | |
|---|---|
| 1 | 2 |
| 5 | |

| Terminal No. | Color of Wire | Signal Name |
|---|---|---|
| 1 | L | – |
| 2 | SB | – |
| 3 | L | – |
| 5 | G | – |

| Connector No. | E58 |
|---|---|
| Connector Name | JOINT CONNECTOR-E03 |
| Connector Color | BLACK |

H.S.

| 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 24 | 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 |

| Terminal No. | Color of Wire | Signal Name |
|---|---|---|
| 10 | B/R | – |
| 11 | SHIELD | – |
| 12 | SHIELD | – |

AADIA0662GB

| Terminal No. | Color of Wire | Signal Name |
|---|---|---|
| 44 | P | ENCODER SIGNAL B |
| 45 | V | ENCODER SIGNAL A |
| 46 | B | P POSITION OUTPUT (SELECT INDICATOR) |
| 47 | LG | P/N POSITION SIGNAL |
| 48 | W | P POSITION SIGNAL |
| 51 | R | POWER ON POWER SUPPLY |
| 56 | G | ENCODER GROUND |
| 57 | O | ELECTRIC SHIFT SENSOR GND 1 |
| 58 | B/R | VCM GROUND |
| 65 | B | VCM GROUND |

| Connector No. | E61 |
|---|---|
| Connector Name | VCM |
| Connector Color | BLACK |

H.S.




| Terminal No. | Color of Wire | Signal Name |
|---|---|---|
| 1 | B | MOTOR COIL A U-PHASE |
| 3 | W | ELECTRIC SHIFT SENSOR NO. 5 |
| 7 | O/L | ELECTRIC SHIFT SENSOR POWER SUPPLY 1 |
| 9 | S B | PARKING ACTUATOR RELAY A |
| 13 | S B | MOTOR COIL A V-PHASE |
| 16 | R | ELECTRIC SHIFT SENSOR NO. 3 |
| 17 | B | ELECTRIC SHIFT SENSOR NO. 1 |
| 18 | Y | R POSITION OUTPUT (SELECT INDICATOR) |
| 24 | L | EV SYSTEM CAN-H |
| 25 | G | EV SYSTEM CAN-L |
| 32 | B | VENC |
| 33 | L | N POSITION OUTPUT (SELECT INDICATOR) |
| 34 | R | D POSITION OUTPUT (SELECT INDICATOR) |
| 39 | R | MOTOR COIL A W-PHASE |

| Connector No. | E60 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Color | BLACK |

H.S.




| Terminal No. | Color of Wire | Signal Name |
|---|---|---|
| 3 | L | – |
| 4 | G | – |
| 5 | L | – |
| 6 | G | – |

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| Connector No. | E62 |
|---|---|
| Connector Name | VCM |
| Connector Color | BROWN |

H.S.




| Terminal No. | Color of Wire | Signal Name |
|---|---|---|
| 74 | G | POWER ON POWER SUPPLY |
| 79 | R | 12V BATTERY POWER SUPPLY |
| 83 | W | ELECTRIC SHIFT SENSOR POWER SUPPLY 2 |
| 84 | W | ELECTRIC SHIFT SENSOR NO. 2 |
| 85 | G | ELECTRIC SHIFT SENSOR NO. 4 |
| 86 | G | ELECTRIC SHIFT SENSOR NO. 6 |
| 99 | R | P POSITION SW NO. 1 |
| 101 | P | STOP LAMP SWITCH |
| 112 | B | P POSITION SW NO. 2 |
| 118 | B | VCM GROUND |
| 124 | W/L | ELECTRIC SHIFT SENSOR GND 2 |
| 126 | B/R | VCM GROUND |

| Connector No. | E102 |
|---|---|
| Connector Name | STOP LAMP SWITCH |
| Connector Color | WHITE |

H.S.

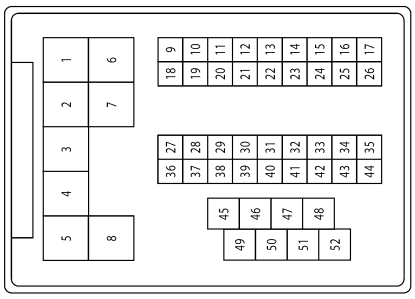



| Terminal No. | Color of Wire | Signal Name |
|---|---|---|
| 3 | R | – |
| 4 | P | – |

AADIA0719GB

| Connector No. | F1 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Color | BLACK |

H.S.

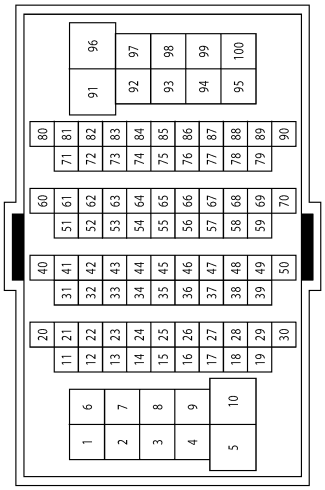


| Terminal No. | Color of Wire | Signal Name |
|---|---|---|
| 36 | G | – |
| 37 | O | – |
| 38 | W | – |
| 39 | R | – |
| 47 | G | – |
| 48 | SB | – |
| 51 | R | – |
| 52 | B | – |

| Terminal No. | Color of Wire | Signal Name |
|---|---|---|
| 18 | O | – |
| 19 | W/L | – |
| 21 | R | – |
| 22 | B | – |
| 23 | LG | – |
| 24 | B | – |
| 25 | W | – |
| 26 | W | – |
| 27 | B | – |
| 28 | O/L | – |
| 29 | W | – |
| 47 | LG | – |
| 49 | L | – |
| 50 | G | – |

| Connector No. | E105 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Color | WHITE |

H.S.



| Terminal No. | Color of Wire | Signal Name |
|---|---|---|
| 9 | G | – |
| 11 | L | – |
| 12 | Y | – |
| 13 | W | – |
| 14 | R | – |
| 15 | G | – |
| 16 | G | – |
| 17 | R | – |

AADIA0753GB

| Terminal No. | Color of Wire | Signal Name |
|---|---|---|
| 4 | – | – |
| 5 | O | – |
| 6 | SB | – |
| 7 | LG | – |
| 8 | G | – |
| 9 | – | – |
| 10 | – | – |

| Connector No. | F4 |
|---|---|
| Connector Name | PARKING ACTUATOR |
| Connector Color | BLACK |

H.S.




| Terminal No. | Color of Wire | Signal Name |
|---|---|---|
| 1 | B | – |
| 2 | G | – |
| 3 | W | – |

| Connector No. | F2 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Color | BLACK |

H.S.




| Terminal No. | Color of Wire | Signal Name |
|---|---|---|
| 3 | L | – |
| 4 | G | – |
| 5 | L | – |
| 6 | G | – |

| Connector No. | B24 |
|---|---|
| Connector Name | LI-ION BATTERY |
| Connector Color | GRAY |

H.S.




| Terminal No. | Color of Wire | Signal Name |
|---|---|---|
| 1 | L | – |
| 2 | G | – |

| Connector No. | B3 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Color | WHITE |

H.S.




| Terminal No. | Color of Wire | Signal Name |
|---|---|---|
| 15 | L | – |
| 16 | G | – |

AADIA0754GB

# BASIC INSPECTION

## DIAGNOSIS AND REPAIR WORK FLOW

### Diagnosis Flow

INFOID:0000000010119571

#### 1.OBTAIN INFORMATION ABOUT SYMPTOM

Refer to TM-64, "Question sheet" and interview the customer to obtain the malfunction information (conditions and environment when the malfunction occurred) as much as possible when the customer brings in the vehicle.

>> GO TO 2.

#### 2.CHECK DTC IN VCM

1. Check DTC in VCM.
2. Check related service bulletins for information.

Are any DTCs detected?

YES >> Check the DTC. Refer to EVC-102, "DTC Index".
NO >> GO TO 3.

#### 3.CHECK DTC IN ELECTRIC SHIFT

1. Before checking the malfunction, check whether any DTC exists.
2. If DTC exists, perform the following operations.

- Record the DTC and freeze frame data. (Print out the data using CONSULT and affix them to the Work Order Sheet.)
- Erase DTCs.
- Check the relationship between the cause that is clarified with DTC and the malfunction information described by the customer.

3. Check the information of related service bulletins and others also.

Do malfunction information and DTC exist?

Malfunction information and DTC exists. >>GO TO 4.
Malfunction information exists, but no DTC. >>GO TO 5.
No malfunction information, but DTC exists. >>GO TO 6.

#### 4.REPRODUCE MALFUNCTION SYMPTOM

Check any malfunction described by a customer, except those with DTC on the vehicle.
Also investigate whether the symptom is a fail-safe or normal operation. Refer to TM-49, "Fail-Safe".
When a malfunction symptom is reproduced, the question sheet is effective. Refer to TM-64, "Question sheet".
Verify the relationship between the symptom and the conditions in which the malfunction described by the customer occurs.

>> GO TO 6.

#### 5.REPRODUCE MALFUNCTION SYMPTOM

Check the malfunction described by the customer on the vehicle.
Also investigate whether the symptom is a fail-safe or normal operation. Refer to TM-49, "Fail-Safe".
When a malfunction symptom is reproduced, the question sheet is effective. Refer to TM-64, "Question sheet".
Verify the relationship between the symptom and the conditions in which the malfunction described by the customer occurs.

>> GO TO 8.

#### 6.PERFORM “DTC CONFIRMATION PROCEDURE”

Perform “DTC CONFIRMATION PROCEDURE” of the appropriate DTC to check if DTC is detected again.
Refer to TM-50, "DTC Inspection Priority Chart" when multiple DTCs are detected, and then determine the order for performing the diagnosis.

**NOTE:**
If no DTC is detected, refer to the freeze frame data.

Is any DTC detected?

YES >> GO TO 7.
NO >> Check according to GI-53, "Intermittent Incident".

## 7. REPAIR OR REPLACE THE MALFUNCTIONING PARTS

Repair or replace the detected malfunctioning parts.
Reconnect parts or connector after repairing or replacing, and then erase DTC if necessary.

>> GO TO 8.

## 8. FINAL CHECK

Perform “DTC CONFIRMATION PROCEDURE” again to make sure that the repair is correctly performed.
Check that malfunctions are not reproduced when obtaining the malfunction information from the customer, referring to the symptom inspection result in step 4 or 5.

Is DTC or malfunction symptom reproduced?

YES >> GO TO 2.
NO >> Before delivering the vehicle to the customer, make sure that DTC is erased.

## Question sheet

INFOID:0000000010119572

### DESCRIPTION

By understanding those conditions properly, a quick and exact diagnosis can be achieved.
In general, customers have their own criteria for a problem. Therefore, it is important to understand the symptom and status well enough by asking the customer about the concerns carefully. In order to systemize all the information for the diagnosis, prepare the question sheet referring to the question points.

**KEY POINTS**

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

SEF907L

### WORKSHEET SAMPLE

Question Sheet

| | | | | | | |
|---|---|---|---|---|---|---|
| Customer name MR/MS | | Motor No. | | Manuf. Date | | |
| | | Incident Date | | VIN | | |
| | | Model & Year | | In Service Date | | |
| | | Mileage | km / Mile | | | |
| Symptoms | | ☐ Vehicle does not move (☐ Any position ☐ Particular position ) | | | | |
| | | ☐ Does not shift P position | | | | |
| | | ☐ Does not shift R, N and D positions | | | | |
| | | ☐ Others | | | | |
| Frequency | | ☐ All the time | ☐ Under certain conditions | ☐ Sometimes ( times a day) | | |
| Weather conditions | | ☐ Not affected | | | | |
| | Weather | ☐ Fine | ☐ Clouding | ☐ Raining | ☐ Snowing | ☐ Other ( ) |
| | Temp. | ☐ Hot | ☐ Warm | ☐ Cool | ☐ Cold | ☐ Temp. [Approx. °C ( °F)] |
| | Humidity | ☐ High | ☐ Middle | ☐ Low | | |
| Road conditions | | ☐ Not affected | | | | |
| | | ☐ In town | ☐ In suburbs | ☐ Freeway | ☐ Off road (Up / Down) | |

| Question Sheet | |
|---|---|
| Driving conditions | ☐ Not affected |
| | ☐ At starting ☐ While idling ☐ While engine racing ☐ At racing ☐ While cruising |
| | ☐ While accelerating ☐ While decelerating ☐ While turning (Right / Left) |
| | ☐ Vehicle speed [ km/h ( MPH)] |
| Other conditions | |

# DTC/CIRCUIT DIAGNOSIS

## P0571 BRAKE SWITCH A

### DTC Logic

INFOID:0000000010119573

#### DTC DETECTION LOGIC

| DTC | CONSULT screen terms (Trouble diagnosis content) | DTC detection condition | Possible cause |
|---|---|---|---|
| P0571 | BRAKE SWITCH A (Brake Switch “A” Circuit) | It is detected that the stop lamp switch cannot be switched to ON/OFF. | • Stop lamp switch (ON stuck or OFF stuck)<br>• Electric shift control module<br>• Harness or connectors (Each circuit is open or shorted.) |

#### DTC CONFIRMATION PROCEDURE

**CAUTION:**

**Always drive vehicle at a safe speed.**

**1.** PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, power switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

**2.** PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Set the vehicle to READY.
2. Accelerate the vehicle up to 50 km/h (31 MPH) and then depress the brake pedal to decelerate and stop the vehicle.
3. Repeat step 2 five more times.
4. Check DTC.

Is “P0571” detected?

YES >> Go to TM-66, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-53, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

### Diagnosis Procedure

INFOID:0000000010119574

**1.** CHECK STOP LAMP SWITCH SIGNAL

With CONSULT
1. Set the vehicle to READY.
2. Select “Data Monitor” in “SHIFT”.
3. Select “BRAKE SWITCH” and “BRAKE SWITCH (CAN)”.
4. Identify an abnormal signal value.

| Condition | Item | |
|---|---|---|
| | BRAKE SWITCH | BRAKE SWITCH (CAN) |
| Brake pedal is depressed | ON | ON |
| Brake pedal is released | OFF | OFF |

Which signal value is abnormal?

BRAKE SWITCH>>GO TO 2.
BRAKE SWITCH (CAN)>>GO TO 5.

**2.** CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT

1. Power switch OFF.

2. Disconnect the stop lamp switch connector.
3. Check the voltage between stop lamp switch vehicle side harness connector terminal and ground.

| Stop lamp switch | | Ground | Voltage |
|---|---|---|---|
| Connector | Terminal | | |
| E102 | 3 | Ground | 9 – 16 V |

Is the inspection result normal?

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

## 3. DETECTION OF MALFUNCTION ITEMS

Check the following items:
- Harness open circuit or short circuit between the stop lamp switch vehicle side harness connector and 12V battery.
- 12V battery
- 20A fuse (#77) (Refer to PG-87, "How To Check".)

Is the inspection result normal?

>> Repair or replace the malfunctioning parts.

## 4. CHECK STOP LAMP SWITCH SIGNAL INPUT CIRCUIT

1. Disconnect the VCM connector.
2. Check the continuity between VCM vehicle side harness connector terminal and stop lamp switch vehicle side harness connector terminal.

| VCM | | Stop lamp switch | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| E62 | 101 | E102 | 4 | Existed |

3. Check the continuity between VCM vehicle side harness connector terminal and ground.

| VCM | | Ground | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| E62 | 101 | Ground | Not existed |

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace the malfunctioning parts.

## 5. CHECK STOP LAMP SWITCH

Check the stop lamp switch. Refer to BRC-100, "Component Inspection".

Is the inspection result normal?

YES >> Replace the VCM due to malfunction in the electric shift control module built in VCM. Refer to EVC-423, "Removal and Installation".
NO >> Replace the stop lamp switch. Refer to BRC-10, "Component Parts Location".

# P0705 TRANSMISSION RANGE SENSOR A

## DTC Logic

INFOID:0000000010119575

### DTC DETECTION LOGIC

| DTC | CONSULT screen terms [Trouble diagnosis content] | DTC detection condition | Possible cause |
|---|---|---|---|
| P0705 | TRANSMISSION RANGE SENSOR A [Transmission Range Sensor “A” Circuit (PRNDL Input)] | One of the electric shift sensors No. 1 to No. 6 is stuck at ON or OFF. | • Electric shift sensor<br>• Harness or connectors (Each circuit is open or shorted.) |

Position Pattern Table

| Electric shift control module recognition position | Selector lever position | Electric shift sensor | | | | | |
|---|---|---|---|---|---|---|---|
| | | No. 1 | No. 2 | No. 3 | No. 4 | No. 5 | No. 6 |
| H | H | OFF | OFF | ON | OFF | OFF | ON |
| P | H | OFF | OFF | ON | OFF | OFF | ON |
| R | R | ON | ON | OFF | OFF | OFF | OFF |
| N | N | OFF | ON | ON | ON | OFF | OFF |
| D | D | OFF | OFF | OFF | ON | ON | OFF |

### DTC CONFIRMATION PROCEDURE

#### 1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, power switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

#### 2.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Set the vehicle to READY.
2. Select “Data Monitor” in “SHIFT”.
3. Select “RANGE POSITION”.
4. Shift the selector lever as follows. (Hold the selector lever at each position for 2 seconds or more.)
- H → N → R → N → D → N → H
5. Repeat step 4 five more times.
6. Check DTC.

Is “P0705” detected?

YES >> Go to TM-68, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-53, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

## Diagnosis Procedure

INFOID:0000000010119576

#### 1.CHECK ELECTRIC SHIFT SENSOR INPUT SIGNAL

With CONSULT
1. Set the vehicle to READY.
2. Select “Data Monitor” in “SHIFT”.
3. Select “SHIFT SENSOR 1”, “SHIFT SENSOR 2”, “SHIFT SENSOR 3”, “SHIFT SENSOR 4”, “SHIFT SENSOR 5”, and “SHIFT SENSOR 6”.
4. Operate the selector lever to identify a electric shift sensor of which value does not change.

| Monitor item | Condition | Value / Status |
|---|---|---|
| SHIFT SENSOR 1 | Selector lever is held in R position | ON |
| | Other than the above | OFF |

| Monitor item | Condition | Value / Status |
|---|---|---|
| SHIFT SENSOR 2 | Selector lever is held in R and N positions | ON |
| | Other than the above | OFF |
| SHIFT SENSOR 3 | Selector lever is held in H (Home) and N positions | ON |
| | Other than the above | OFF |
| SHIFT SENSOR 4 | Selector lever is held in N and D positions | ON |
| | Other than the above | OFF |
| SHIFT SENSOR 5 | Selector lever is held in D position | ON |
| | Other than the above | OFF |
| SHIFT SENSOR 6 | Selector lever in H (Home) position | ON |
| | Other than the above | OFF |

Without CONSULT
1. Set the vehicle to READY.
2. Operate the selector lever.
3. Check the voltage between VCM vehicle side harness connector terminal and ground.

| Electric shift sensor | VCM | | Ground | Condition | Voltage (Approx.) |
|---|---|---|---|---|---|
| | Connector | terminal | | | |
| 1 | E61 | 17 | Ground | Selector lever is held in R position | 0 V |
| | | | | Other than the above | 5 V |
| 3 | | 16 | | Selector lever is held in H (Home) and N positions | 0 V |
| | | | | Other than the above | 5 V |
| 5 | | 3 | | Selector lever is held in D position | 0 V |
| | | | | Other than the above | 5 V |
| 2 | E62 | 84 | | Selector lever is held in R and N positions | 0 V |
| | | | | Other than the above | 5 V |
| 4 | | 85 | | Selector lever is held in N and D position | 0 V |
| | | | | Other than the above | 5 V |
| 6 | | 86 | | Selector lever in H (Home) position | 0 V |
| | | | | Other than the above | 5 V |

>> GO TO 2.

## 2. CHECK HARNESS BETWEEN VCM AND ELECTRIC SHIFT SENSOR

1. Power switch OFF.
2. Disconnect the VCM connector.
3. Disconnect the electric shift sensor connector.
4. Check the continuity between the malfunctioning electric shift sensor identified at Step 1 and the harness connector terminal located on the vehicle side of the VCM.

| Electric shift sensor | VCM | | Electric shift sensor | | Continuity |
|---|---|---|---|---|---|
| | Connector | terminal | Connector | terminal | |
| 1 | E61 | 17 | M57 | 11 | Existed |
| 3 | | 16 | | 10 | |
| 5 | | 3 | | 9 | |
| 2 | E62 | 84 | | 5 | |
| 4 | | 85 | | 3 | |
| 6 | | 86 | | 4 | |

5. Check the continuity VCM vehicle side harness connector terminal and ground.

| Electric shift sensor | VCM | | Ground | Continuity |
|---|---|---|---|---|
| | Connector | terminal | | |
| 1 | E61 | 17 | Ground | Not existed |
| 3 | | 16 | | |
| 5 | | 3 | | |
| 2 | E62 | 84 | | |
| 4 | | 85 | | |
| 6 | | 86 | | |

Is the inspection result normal?

YES >> Replace the electric shift sensor. Refer to TM-121, "Exploded View".
NO >> Repair or replace damaged parts.

# P0706 TRANSMISSION RANGE SENSOR A

## DTC Logic

INFOID:0000000010119577

### DTC DETECTION LOGIC

| DTC | CONSULT screen terms (Trouble diagnosis content) | DTC detection condition | Possible cause |
|---|---|---|---|
| P0706 | TRANSMISSION RANGE SENSOR A (Transmission range sensor “A” Circuit Range/Performance) | Two or more sensors out of electric shift sensors No. 1 to No. 6 are stuck at ON or OFF. | • Electric shift sensor<br>• Harness or connectors (Each circuit is open or shorted.) |

Position Pattern Table

| Electric shift control module recognition position | Selector lever position | Electric shift sensor | | | | | |
|---|---|---|---|---|---|---|---|
| | | No. 1 | No. 2 | No. 3 | No. 4 | No. 5 | No. 6 |
| H | H | OFF | OFF | ON | OFF | OFF | ON |
| P | H | OFF | OFF | ON | OFF | OFF | ON |
| R | R | ON | ON | OFF | OFF | OFF | OFF |
| N | N | OFF | ON | ON | ON | OFF | OFF |
| D | D | OFF | OFF | OFF | ON | ON | OFF |

### DTC CONFIRMATION PROCEDURE

#### 1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, power switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

#### 2.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Set the vehicle to READY.
2. Select “Data Monitor” in “SHIFT”.
3. Select “RANGE POSITION”.
4. Shift the selector lever as follows. (Hold the selector lever at each position for 2 seconds or more.)

- H → N → R → N → D → N → H

5. Repeat step 4 five more times.
6. Check DTC.

Is “P0706” detected?

YES >> Go to TM-71, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-53, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

## Diagnosis Procedure

INFOID:0000000010119578

#### 1.CHECK ELECTRIC SHIFT SENSOR INPUT SIGNAL

With CONSULT
1. Set the vehicle to READY.
2. Select “Data Monitor” in “SHIFT”.
3. Select “SHIFT SENSOR 1”, “SHIFT SENSOR 2”, “SHIFT SENSOR 3”, “SHIFT SENSOR 4”, “SHIFT SENSOR 5”, and “SHIFT SENSOR 6”.
4. Operate the selector lever to identify a electric shift sensor of which value does not change.

| Monitor item | Condition | Value / Status |
|---|---|---|
| SHIFT SENSOR 1 | Selector lever is held in R position | ON |
| | Other than the above | OFF |

| Monitor item | Condition | Value / Status |
|---|---|---|
| SHIFT SENSOR 2 | Selector lever is held in R and N positions | ON |
| | Other than the above | OFF |
| SHIFT SENSOR 3 | Selector lever is held in H (Home) and N positions | ON |
| | Other than the above | OFF |
| SHIFT SENSOR 4 | Selector lever is held in N and D positions | ON |
| | Other than the above | OFF |
| SHIFT SENSOR 5 | Selector lever is held in D position | ON |
| | Other than the above | OFF |
| SHIFT SENSOR 6 | Selector lever in H (Home) position | ON |
| | Other than the above | OFF |

⊗Without CONSULT
1. Set the vehicle to READY.
2. Operate the selector lever.
3. Check the voltage between VCM vehicle side harness connector terminal and ground.

| Electric shift sensor | VCM | | Ground | Condition | Voltage (Approx.) |
|---|---|---|---|---|---|
| | Connector | terminal | | | |
| 1 | E61 | 17 | Ground | Selector lever is held in R position | 0 V |
| | | | | Other than the above | 5 V |
| 3 | | 16 | | Selector lever is held in H (Home) and N positions | 0 V |
| | | | | Other than the above | 5 V |
| 5 | | 3 | | Selector lever is held in D position | 0 V |
| | | | | Other than the above | 5 V |
| 2 | E62 | 84 | | Selector lever is held in R and N positions | 0 V |
| | | | | Other than the above | 5 V |
| 4 | | 85 | | Selector lever is held in N and D position | 0 V |
| | | | | Other than the above | 5 V |
| 6 | | 86 | | Selector lever in H (Home) position | 0 V |
| | | | | Other than the above | 5 V |

>> GO TO 2.

## 2.CHECK HARNESS BETWEEN VCM AND ELECTRIC SHIFT SENSOR

1. Power switch OFF.
2. Disconnect the VCM connector.
3. Disconnect the electric shift sensor connector.
4. Check the continuity between the malfunctioning electric shift sensor identified at Step 1 and the harness connector terminal located on the vehicle side of the VCM.

| Electric shift sensor | VCM | | Electric shift sensor | | Continuity |
|---|---|---|---|---|---|
| | Connector | terminal | Connector | terminal | |
| 1 | E61 | 17 | M57 | 11 | Existed |
| 3 | | 16 | | 10 | |
| 5 | | 3 | | 9 | |
| 2 | E62 | 84 | | 5 | |
| 4 | | 85 | | 3 | |
| 6 | | 86 | | 4 | |

5. Check the continuity VCM vehicle side harness connector terminal and ground.

| Electric shift sensor | VCM | | Ground | Continuity |
|---|---|---|---|---|
| | Connector | terminal | | |
| 1 | E61 | 17 | Ground | Not existed |
| 3 | | 16 | | |
| 5 | | 3 | | |
| 2 | E62 | 84 | | |
| 4 | | 85 | | |
| 6 | | 86 | | |

Is the inspection result normal?

YES >> Replace the electric shift sensor. Refer to TM-121, "Exploded View".
NO >> Repair or replace damaged parts.

# P0780 SHIFT ERROR

## DTC Logic

INFOID:0000000010119579

### DTC DETECTION LOGIC

| DTC | CONSULT screen terms (Trouble diagnosis content) | DTC detection condition | Possible cause |
|---|---|---|---|
| P0780 | SHIFT ERROR (Shift Error) | In spite of the command from the electric shift control module, the parking actuator does not complete the switching to the designated position (P position or another position). | Parking actuator |

### DTC CONFIRMATION PROCEDURE

#### 1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, power switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

#### 2.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Set the vehicle to READY.
2. Shift the selector lever to N position and wait for 10 seconds or more.
3. Press the P position switch to shift to P position and wait for 10 seconds or more.
4. Check DTC.

Is “P0780” detected?

YES >> Go to TM-74, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-53, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

## Diagnosis Procedure

INFOID:0000000010119580

#### 1.REPLACE REDUCTION GEAR

Replace the reduction gear due to malfunction in the parking actuator. Refer to TM-21, "Removal and Installation".

>> END

# P1722 VEHICLE SPEED

## DTC Logic

INFOID:0000000010119581

### DTC DETECTION LOGIC

| DTC | CONSULT screen terms (Trouble diagnosis content) | DTC detection condition | Possible cause |
|---|---|---|---|
| P1722 | VEHICLE SPEED (Vehicle Speed Signal Circuit) | • The electric shift control module detects a malfunction in the CAN communication signal with the ABS actuator and electric unit (control unit).<br>• The ABS actuator and electric unit (control unit) detects a malfunction with the wheel sensor. | • ABS actuator and electric unit (control unit)<br>• VCM<br>• Electric shift control module<br>• Harness or connectors (Each circuit is open or shorted.) |

### DTC CONFIRMATION PROCEDURE

**CAUTION:**

**Always drive vehicle at a safe speed.**

**1.** PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, power switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

**2.** PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Set the vehicle to READY.
2. Drive the vehicle at 30 km/h (19 MPH) or more for 60 seconds.
3. Stop the vehicle.
4. Check DTC.

Is “P1722” detected?

YES >> Go to TM-75, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-53, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

## Diagnosis Procedure

INFOID:0000000010119582

**1.** CHECK DTC OF ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

With CONSULT
1. Power switch ON.
2. Perform “Self Diagnostic Results” in “ABS”.

Is any DTC detected?

YES >> Check DTC detected item. Refer to BRC-56, "DTC Index".
NO >> GO TO 2.

**2.** CHECK DTC OF VCM

With CONSULT
1. Power switch ON.
2. Perform “Self Diagnostic Results” in “EV/HEV”.

Is any DTC detected?

YES >> Check DTC detected item. Refer to EVC-102, "DTC Index".
NO >> GO TO 3.

**3.** CHECK INTERMITTENT INCIDENT

Refer to GI-53, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace the VCM due to malfunction in the electric shift control module built in VCM. Refer to EVC-423, "Removal and Installation".

NO >> Repair or replace damaged parts.

# P1802 CONTROL MODULE

## DTC Logic

INFOID:0000000010119583

### DTC DETECTION LOGIC

| DTC | CONSULT screen terms [Trouble diagnosis content] | DTC detection condition | Possible cause |
|---|---|---|---|
| P1802 | CONTROL MODULE [Control Module (RAM)] | A malfunction is detected in the electric shift control module. | Electric shift control module |

### DTC CONFIRMATION PROCEDURE

#### 1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, power switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

#### 2.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Power switch OFF to ON and wait for 2 seconds or more.
2. Check DTC.

Is “P1802” detected?

YES >> Go to TM-77, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-53, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

## Diagnosis Procedure

INFOID:0000000010119584

#### 1.REPLACE VCM

Replace the VCM due to malfunction in the electric shift control module built in VCM. Refer to EVC-423, "Removal and Installation".

>> END

# P1803 CONTROL MODULE

## DTC Logic

INFOID:0000000010119585

### DTC DETECTION LOGIC

| DTC | CONSULT screen terms [Trouble diagnosis content] | DTC detection condition | Possible cause |
|---|---|---|---|
| P1803 | CONTROL MODULE [Control Module (ROM)] | A malfunction is detected in the electric shift control module. | Electric shift control module |

### DTC CONFIRMATION PROCEDURE

#### 1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, power switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

#### 2.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Power switch OFF to ON and wait for 2 seconds or more.
2. Check DTC.

Is “P1803” detected?

YES >> Go to TM-78, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-53, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

## Diagnosis Procedure

INFOID:0000000010119586

#### 1.REPLACE VCM

Replace the VCM due to malfunction in the electric shift control module built in VCM. Refer to EVC-423, "Removal and Installation".

>> END

# P1804 CONTROL MODULE

## DTC Logic

INFOID:0000000010119587

### DTC DETECTION LOGIC

| DTC | CONSULT screen terms [Trouble diagnosis content] | DTC detection condition | Possible cause |
|---|---|---|---|
| P1804 | CONTROL MODULE [Control Module (EEPROM)] | A malfunction is detected in the electric shift control module. | Electric shift control module |

### DTC CONFIRMATION PROCEDURE

#### 1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, power switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

#### 2.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Power switch OFF to ON and wait for 2 seconds or more.
2. Check DTC.

Is “P1804” detected?

YES >> Go to TM-79, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-53, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

## Diagnosis Procedure

INFOID:0000000010119588

#### 1.REPLACE VCM

Replace the VCM due to malfunction in the electric shift control module built in VCM. Refer to EVC-423, "Removal and Installation".

>> END

# P1811 ELECTRIC SHIFT POWER SUPPLY RELAY

## DTC Logic

INFOID:0000000010119589

### DTC DETECTION LOGIC

| DTC | CONSULT screen terms (Trouble diagnosis content) | DTC detection condition | Possible cause |
|---|---|---|---|
| P1811 | ELECTRIC SHIFT POWER SUPPLY RELAY (Electric Shift Power Supply Relay Circuit) | A malfunction is detected in the electric shift control module. | Electric shift control module |

### DTC CONFIRMATION PROCEDURE

#### 1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, power switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

#### 2.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Power switch OFF to ON and wait for 2 seconds or more.
2. Power switch OFF and wait for 60 seconds or more.
3. Power switch ON and wait for 2 seconds or more.
4. Check DTC.

Is “P1811” detected?

YES >> Go to TM-80, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-53, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

## Diagnosis Procedure

INFOID:0000000010119590

#### 1.REPLACE VCM

Replace the VCM due to malfunction in the electric shift control module built in VCM. Refer to EVC-423, "Removal and Installation".

>> END

# P1895 MOTOR SPEED

## DTC Logic

INFOID:0000000010119591

### DTC DETECTION LOGIC

| DTC | CONSULT screen terms (Trouble diagnosis content) | DTC detection condition | Possible cause |
|---|---|---|---|
| P1895 | MOTOR SPEED (Motor Speed Signal) | The motor speed signal from the traction motor inverter is not normal. | • Traction motor<br>• Traction motor inverter<br>• Electric shift control module<br>• Harness or connectors (CAN communication line is open or shorted.) |

### DTC CONFIRMATION PROCEDURE

**CAUTION:**

**Always drive vehicle at a safe speed.**

**1.** PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, turn the power switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

**2.** PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Set the vehicle to READY.
2. Drive the vehicle at 30 km/h (19 MPH) or more for 60 seconds.
3. Stop the vehicle.
4. Check DTC.

Is “P1895” detected?

YES >> Go to TM-81, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-53, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

## Diagnosis Procedure

INFOID:0000000010119592

**1.** CHECK DTC OF TRACTION MOTOR INVERTER

With CONSULT
1. Power switch ON.
2. Perform “Self Diagnostic Results” in “MOTOR CONTROL”.

Is any DTC detected?

YES >> Check DTC detected item. Refer to TMS-28, "DTC Index".
NO >> GO TO 2.

**2.** CHECK INTERMITTENT INCIDENT

Refer to GI-53, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace the VCM due to malfunction in the electric shift control module built in VCM. Refer to EVC-423, "Removal and Installation".
NO >> Repair or replace damaged parts.

# P1896 SHIFT POWER SUPPLY

## DTC Logic

INFOID:0000000010119593

### DTC DETECTION LOGIC

| DTC | CONSULT screen terms (Trouble diagnosis content) | DTC detection condition | Possible cause |
|---|---|---|---|
| P1896 | SHIFT POWER SUPPLY (Electric Shift Sensor Power Supply) | It is detected that electric shift sensors No. 1, 3, and 5 are stuck at OFF. | • Electric shift sensor<br>• Electric shift control module<br>• Harness or connectors (Each circuit is open or shorted.) |
| | | It is detected that electric shift sensors No. 2, 4, and 6 are stuck at OFF. | |

Position Pattern Table

| Electric shift control module recognition position | Selector lever position | Electric shift sensor | | | | | |
|---|---|---|---|---|---|---|---|
| | | No. 1 | No. 2 | No. 3 | No. 4 | No. 5 | No. 6 |
| H | H | OFF | OFF | ON | OFF | OFF | ON |
| P | H | OFF | OFF | ON | OFF | OFF | ON |
| R | R | ON | ON | OFF | OFF | OFF | OFF |
| N | N | OFF | ON | ON | ON | OFF | OFF |
| D | D | OFF | OFF | OFF | ON | ON | OFF |

### DTC CONFIRMATION PROCEDURE

#### 1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, power switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

#### 2.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Set the vehicle to READY.
2. Select “Data Monitor” in “SHIFT”.
3. Select “RANGE POSITION”.
4. Shift the selector lever as follows. (Hold the selector lever at each position for 2 seconds or more.)

- H → N → R → N → D → N → H

5. Repeat step 4 five times.
6. Check DTC.

Is “P1896” detected?

YES >> Go to TM-82, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-53, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

## Diagnosis Procedure

INFOID:0000000010119594

#### 1.CHECK ELECTRIC SHIFT SENSOR INPUT SIGNAL

With CONSULT
1. Set the vehicle to READY.
2. Select “Data Monitor” in “SHIFT”.
3. Select “SHIFT SENSOR 1”, “SHIFT SENSOR 2”, “SHIFT SENSOR 3”, “SHIFT SENSOR 4”, “SHIFT SENSOR 5”, and “SHIFT SENSOR 6”.
4. Operate the selector lever to identify a electric shift sensor of which value does not change.

| Monitor item | Condition | Value / Status |
|---|---|---|
| SHIFT SENSOR 1 | Selector lever is held in R position | ON |
| | Other than the above | OFF |
| SHIFT SENSOR 2 | Selector lever is held in R and N positions | ON |
| | Other than the above | OFF |
| SHIFT SENSOR 3 | Selector lever is held in H (Home) and N positions | ON |
| | Other than the above | OFF |
| SHIFT SENSOR 4 | Selector lever is held in N and D positions | ON |
| | Other than the above | OFF |
| SHIFT SENSOR 5 | Selector lever is held in D position | ON |
| | Other than the above | OFF |
| SHIFT SENSOR 6 | Selector lever in H (Home) position | ON |
| | Other than the above | OFF |

⊗Without CONSULT
1. Set the vehicle to READY.
2. Operate the selector lever.
3. Check the voltage between VCM vehicle side harness connector terminal and ground.

| Electric shift sensor | VCM | | Ground | Condition | Voltage (Approx.) |
|---|---|---|---|---|---|
| | Connector | terminal | | | |
| 1 | E61 | 17 | Ground | Selector lever is held in R position | 0 V |
| | | | | Other than the above | 5 V |
| 3 | | 16 | | Selector lever is held in H (Home) and N positions | 0 V |
| | | | | Other than the above | 5 V |
| 5 | | 3 | | Selector lever is held in D position | 0 V |
| | | | | Other than the above | 5 V |
| 2 | E62 | 84 | | Selector lever is held in R and N positions | 0 V |
| | | | | Other than the above | 5 V |
| 4 | | 85 | | Selector lever is held in N and D position | 0 V |
| | | | | Other than the above | 5 V |
| 6 | | 86 | | Selector lever in H (Home) position | 0 V |
| | | | | Other than the above | 5 V |

>> GO TO 2.

## 2.CHECK ELECTRIC SHIFT SENSOR POWER SUPPLY CIRCUIT

1. Power switch OFF.
2. Disconnect the electric shift sensor connector.
3. Power switch ON.
4. Check the power circuit of the malfunctioning electric shift sensor identified at Step 1.
5. Check the voltage between electric shift sensor vehicle side harness connector terminal and ground.

| Electric shift sensor | Electric shift sensor | | Ground | Voltage (Approx.) |
|---|---|---|---|---|
| | Connector | Terminal | | |
| 1, 3, 5 | M57 | 1 | Ground | 5 V |
| 2, 4, 6 | | 7 | | |

Is the inspection result normal?

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

## 3. CHECK HARNESS BETWEEN VCM AND ELECTRIC SHIFT SENSOR

1. Power switch OFF.
2. Disconnect the VCM connector.
3. Check the continuity between VCM vehicle side harness connector terminal and electric shift sensor vehicle side harness connector terminal.

| Electric shift sensor | VCM | | Electric shift sensor | | Continuity |
|---|---|---|---|---|---|
| | Connector | Terminal | Connector | Terminal | |
| 1, 3, 5 | E61 | 7 | M57 | 1 | Existed |
| 2, 4, 6 | E62 | 83 | | 7 | |

4. Check the continuity between VCM vehicle side harness connector terminal and ground.

| Electric shift sensor | VCM | | Ground | Continuity |
|---|---|---|---|---|
| | Connector | Terminal | | |
| 1, 3, 5 | E61 | 7 | Ground | Not existed |
| 2, 4, 6 | E62 | 83 | | |

Is the inspection result normal?

YES >> Replace the VCM due to malfunction in the electric shift control module built in VCM. Refer to EVC-423, "Removal and Installation".
NO >> Repair or replace damaged parts.

## 4. CHECK ELECTRIC SHIFT SENSOR GROUND CIRCUIT

1. Power switch OFF.
2. Disconnect the VCM connector.
3. Check the continuity between VCM vehicle side harness connector terminal and electric shift sensor vehicle side harness connector terminal.

| Electric shift sensor | VCM | | Electric shift sensor | | Continuity |
|---|---|---|---|---|---|
| | Connector | Terminal | Connector | Terminal | |
| 1, 3, 5 | E61 | 57 | M57 | 6 | Existed |
| 2, 4, 6 | E62 | 124 | | 12 | |

4. Check the continuity between VCM vehicle side harness connector terminal and ground.

| Electric shift sensor | VCM | | Ground | Continuity |
|---|---|---|---|---|
| | Connector | Terminal | | |
| 1, 3, 5 | E61 | 57 | Ground | Not existed |
| 2, 4, 6 | E62 | 124 | | |

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace damaged parts.

## 5. CHECK HARNESS BETWEEN VCM AND ELECTRIC SHIFT SENSOR

1. Check the continuity between VCM vehicle side harness connector terminal and electric shift sensor vehicle side harness connector terminal.

| Electric shift sensor | VCM | | Electric shift sensor | | Continuity |
|---|---|---|---|---|---|
| | Connector | terminal | Connector | terminal | |
| 1 | E61 | 17 | M57 | 11 | Existed |
| 3 | | 16 | | 10 | |
| 5 | | 3 | | 9 | |
| 2 | E62 | 84 | | 5 | |
| 4 | | 85 | | 3 | |
| 6 | | 86 | | 4 | |

2. Check the continuity between VCM vehicle side harness connector terminals and ground.

| Electric shift sensor | VCM | | Ground | Continuity |
|---|---|---|---|---|
| | Connector | terminal | | |
| 1 | E61 | 17 | Ground | Not existed |
| 3 | | 16 | | |
| 5 | | 3 | | |
| 2 | E62 | 84 | | |
| 4 | | 85 | | |
| 6 | | 86 | | |

Is the inspection result normal?

YES >> Replace the electric shift sensor. Refer to TM-122, "Disassembly and Assembly".
NO >> Repair or replace damaged parts.

# P1897 ENCODER ERROR

## DTC Logic

INFOID:0000000010119595

### DTC DETECTION LOGIC

| DTC | CONSULT screen terms (Trouble diagnosis content) | DTC detection condition | Possible cause |
|---|---|---|---|
| P1897 | ENCODER ERROR (Encoder Error) | Encoder signals are not transmitted despite the actuation of parking actuator by the electric shift control module. | • Encoder (Parking actuator)<br>• Harness or connectors (Each circuit is open or shorted.) |

### DTC CONFIRMATION PROCEDURE

#### 1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, power switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

#### 2.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Set the vehicle to READY.
2. Shift the selector lever to N position and wait for 10 seconds or more.
3. Press the P position switch to shift to P position and wait for 10 seconds or more.
4. Check DTC.

Is “P1897” detected?

YES >> Go to TM-86, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-53, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

## Diagnosis Procedure

INFOID:0000000010119596

#### 1.CHECK ENCODER POWER SUPPLY CIRCUIT

1. Power switch OFF.
2. Disconnect the parking actuator connector.
3. Check the voltage between parking actuator vehicle side harness connector terminal and ground.

| Parking actuator | | Ground | Condition | Voltage (Approx.) |
|---|---|---|---|---|
| Connector | Terminal | | | |
| F4 | 9 | Ground | Power switch ON | 5 V |

Is the inspection result normal?

YES >> GO TO 2.
NO >> GO TO 4.

#### 2.CHECK HARNESS BETWEEN VCM AND ENCODER

1. Power switch OFF.
2. Disconnect the VCM connector.
3. Check the continuity between VCM vehicle side harness connector terminals and parking actuator vehicle side harness connector terminals.

| VCM | | Parking actuator | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| E61 | 44 | F4 | 3 | Existed |
| | 45 | | 5 | |
| | 56 | | 8 | |

4. Check the continuity between VCM vehicle side harness connector terminals and ground.

| VCM | | Ground | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| E61 | 44 | Ground | Not existed |
| | 45 | | |
| | 56 | | |

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace damaged parts.

## 3. CHECK INTERMITTENT INCIDENT

Refer to GI-53, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace the reduction gear due to malfunction in the encoder (parking actuator). Refer to TM-21, "Removal and Installation".
NO >> Repair or replace damaged parts.

## 4. CHECK HARNESS BETWEEN VCM AND ENCODER

1. Power switch OFF.
2. Disconnect the VCM connector.
3. Check the continuity between VCM vehicle side harness connector terminal and parking actuator vehicle side harness connector terminal.

| VCM | | Parking actuator | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| E61 | 32 | F4 | 9 | Existed |

4. Check the continuity between VCM vehicle side harness connector terminals and ground.

| VCM | | Ground | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| E61 | 32 | Ground | Not existed |

Is the inspection result normal?

YES >> Replace the VCM due to malfunction in the electric shift control module built in VCM. Refer to EVC-423, "Removal and Installation".
NO >> Repair or replace damaged parts.

# P1899 MOTOR A

## DTC Logic

INFOID:0000000010119597

### DTC DETECTION LOGIC

| DTC | CONSULT screen terms (Trouble diagnosis content) | DTC detection condition | Possible cause |
|---|---|---|---|
| P1899 | MOTOR A (Motor “A” Circuit High) | When the power switch is ON, either of two energized phases is in the non-energized state. **NOTE:** Energized: Approx. 0 V, Non-energized: 9 – 16 V | • Electric shift control module<br>• Motor coil A (Parking actuator)<br>• Harness (12V battery short) |

### DTC CONFIRMATION PROCEDURE

#### 1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, power switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

#### 2.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Power switch ON and wait for 2 seconds or more.
2. Check DTC.

Is “P1899” detected?

YES >> Go to TM-88, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-53, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

## Diagnosis Procedure

INFOID:0000000010119598

#### 1.CHECK HARNESS BETWEEN VCM AND MOTOR COIL A

1. Power switch OFF.
2. Disconnect the VCM connector.
3. Disconnect the parking actuator connector.
4. Check the voltage VCM vehicle side harness connector terminals and ground.

| VCM | | Ground | Voltage (Approx.) |
|---|---|---|---|
| Connector | Terminal | | |
| E61 | 1 | Ground | 0 V |
| | 13 | | |
| | 39 | | |

5. Check the continuity VCM vehicle side harness connector terminals and parking actuator vehicle side harness connector terminals.

| VCM | | Parking actuator | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| E61 | 1 | F4 | 1 | Existed |
| | 13 | | 6 | |
| | 39 | | 7 | |

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace damaged parts.

## 2.CHECK MOTOR COIL A

Check the motor coil A. Refer to TM-89, "Component Inspection (Motor Coil A)".

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace the reduction gear due to malfunction in the motor coil A (parking actuator). Refer to TM-21, "Removal and Installation".

# Component Inspection (Motor Coil A)

INFOID:0000000010119599

## 1.CHECK MOTOR COIL A

1. Disconnect the parking actuator connector.
2. Check the resistance between parking actuator connector terminals.

| Parking actuator connector | | Resistance |
|---|---|---|
| Terminal | | |
| 2 | 1 | 2.3 – 2.8 Ω |
| | 6 | |
| | 7 | |

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace the reduction gear due to malfunction in the motor coil A (parking actuator). Refer to TM-21, "Removal and Installation".

# P189A MOTOR A

## DTC Logic

INFOID:0000000010119600

### DTC DETECTION LOGIC

| DTC | CONSULT screen terms (Trouble diagnosis content) | DTC detection condition | Possible cause |
|---|---|---|---|
| P189A | MOTOR A (Motor “A” Circuit Low) | When the power switch is ON, one of the phases is in the energized state even though motor coil A all phases are not energized.<br>**NOTE:**<br>Energized: Approx. 0 V, Non-energized: 9 – 16 V | • Parking actuator relay A (OFF stuck)<br>• Motor coil A (Parking actuator)<br>• Electric shift control module<br>• Harness or connectors (Each circuit is open or ground shorted.) |

### DTC CONFIRMATION PROCEDURE

#### 1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, key switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

#### 2.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Power switch ON and wait for 2 seconds or more.
2. Check DTC.

Is “P189A” detected?

YES >> Go to TM-90, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-53, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

## Diagnosis Procedure

INFOID:0000000010119601

#### 1.CHECK HARNESS BETWEEN VCM AND MOTOR COIL A

1. Power switch OFF.
2. Disconnect the VCM connector.
3. Disconnect the parking actuator connector.
4. Check the continuity VCM vehicle side harness connector terminals and parking actuator vehicle side harness connector terminals.

| VCM | | Parking actuator | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| E61 | 1 | F4 | 1 | Existed |
| | 13 | | 6 | |
| | 39 | | 7 | |

5. Check the continuity VCM vehicle side harness connector terminals and ground.

| VCM | | Ground | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| E61 | 1 | Ground | Not existed |
| | 13 | | |
| | 39 | | |

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace damaged parts.

## 2.CHECK PARKING ACTUATOR RELAY A

Check the parking actuator relay A. Refer to TM-92, "Component Inspection (Parking Actuator Relay A)".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Replace the parking actuator relay A. Refer to TM-32, "Component Parts Location".

## 3.CHECK HARNESS BETWEEN PARKING ACTUATOR RELAY A AND 12V BATTERY

Check the voltage parking actuator relay A vehicle side harness connector terminal and ground.

| Parking actuator relay A | | Ground | Voltage |
|---|---|---|---|
| Connector | Terminal | | |
| E54 | 1 | Ground | 9 – 16 V |
| | 3 | | |

Is the inspection result normal?

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

## 4.DETECT MALFUNCTIONING ITEM

Check the following.
- Harness for short or open between parking actuator relay A and 12V battery
- 12V battery
- 40A fuse (#O) (Refer to PG-87, "How To Check".)

Is the inspection result normal?

YES >> INSPECTION END
NO >> Repair or replace damaged parts.

## 5.CHECK HARNESS BETWEEN PARKING ACTUATOR AND PARKING ACTUATOR RELAY A

Check the continuity parking actuator vehicle side harness connector terminal and parking actuator relay A vehicle side harness connector terminal.

| Parking actuator | | Parking actuator relay A | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| F4 | 2 | E54 | 5 | Existed |

Is the inspection result normal?

YES >> GO TO 6.
NO >> Repair or replace damaged parts.

## 6.CHECK HARNESS BETWEEN VCM AND PARKING ACTUATOR RELAY A

1. Check the continuity VCM vehicle side harness connector terminal and parking actuator relay A vehicle side harness connector terminal.

| VCM | | Parking actuator relay A | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| E61 | 9 | E54 | 2 | Existed |

2. Check the continuity VCM vehicle side harness connector terminal and ground.

| VCM | | Ground | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| E61 | 9 | Ground | Not existed |

Is the inspection result normal?

YES >> GO TO 7.
NO >> Repair or replace damaged parts.

## 7.CHECK MOTOR COIL A

Check the motor coil A (parking actuator). Refer to TM-92, "Component Inspection (Motor Coil A)".

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace the reduction gear due to malfunction in the motor coil A (parking actuator). Refer to TM-21, "Removal and Installation".

# Component Inspection (Parking Actuator Relay A)

INFOID:0000000010119602

## 1.CHECK PARKING ACTUATOR RELAY A

1. Disconnect the parking actuator relay A. Refer to TM-32, "Component Parts Location".
2. Apply 12 V direct current between parking actuator relay A terminals 1 and 2.
   **CAUTION:**
   - **Never make the terminals short.**
   - **Connect the fuse between the terminals when applying the voltage.**
3. Check the continuity between parking actuator relay A terminals 3 and 5.

| Parking actuator relay A | | Condition | Continuity |
|---|---|---|---|
| Terminal | | | |
| 3 | 5 | Apply 12 V direct current between terminals 1 and 2. | Existed |
| | | Does not apply 12 V direct current between terminals 1 and 2. | Not existed |

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace the parking actuator relay A.

# Component Inspection (Motor Coil A)

INFOID:0000000010119603

## 1.CHECK MOTOR COIL A

1. Disconnect the parking actuator connector.
2. Check the resistance between parking actuator connector terminals.

| Parking actuator connector | | Resistance |
|---|---|---|
| Terminal | | |
| 2 | 1 | 2.3 – 2.8 Ω |
| | 6 | |
| | 7 | |

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace the reduction gear due to malfunction in the motor coil A (parking actuator). Refer to TM-21, "Removal and Installation".

# P189D BACK UP VOLTAGE

## DTC Logic

INFOID:0000000010119604

### DTC DETECTION LOGIC

| DTC | CONSULT screen terms (Trouble diagnosis content) | DTC detection condition | Possible cause |
|---|---|---|---|
| P189D | BACK UP VOLTAGE (Memory Back Up Power Supply) | It is detected that the memory backup power supply voltage is specified value or less. | • Electric shift control module<br>• Harness, fuse, or connectors (Each circuit is open or shorted.) |

### DTC CONFIRMATION PROCEDURE

#### 1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, power switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

#### 2.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Power switch ON and wait for 5 seconds or more.
2. Check DTC.

Is “P189D” detected?

YES >> Go to TM-93, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-53, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

## Diagnosis Procedure

INFOID:0000000010119605

#### 1.CHECK MEMORY BACK UP POWER SUPPLY CIRCUIT

1. Power switch OFF.
2. Disconnect the VCM connector.
3. Check the voltage between VCM vehicle side harness connector terminal and ground.

| VCM | | Ground | Voltage (Approx.) |
|---|---|---|---|
| Connector | Terminal | | |
| E62 | 79 | Ground | 9 – 16 V |

Is the inspection result normal?

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

#### 2.CHECK GROUND CIRCUIT

Check the continuity between VCM vehicle side harness connector terminals and ground.

| VCM | | Ground | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| E61 | 58 | Ground | Existed |
| | 65 | | |
| E62 | 118 | | |
| | 126 | | |

Is the inspection result normal?

YES >> Replace the VCM due to malfunction in the electric shift control module built in VCM. Refer to EVC-423, "Removal and Installation".

NO >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check the following.
- Harness for short or open between VCM vehicle side harness connector and 12V battery.
- 12V battery
- 20A fuse (#77) (Refer to PG-87, "How To Check".)

Is the inspection result normal?

YES >> INSPECTION END
NO >> Repair or replace damaged parts.

# P18A3 CONTROL MODULE

## DTC Logic

INFOID:0000000010119606

### DTC DETECTION LOGIC

| DTC | CONSULT screen terms [Trouble diagnosis content] | DTC detection condition | Possible cause |
|---|---|---|---|
| P18A3 | CONTROL MODULE [Control Module (Program Manipulation) Error] | A malfunction is detected in the electric shift control module. | Electric shift control module |

### DTC CONFIRMATION PROCEDURE

#### 1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, power switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

#### 2.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Power switch OFF to ON and wait for 2 seconds or more.
2. Check DTC.

Is “P18A3” detected?

YES >> Go to TM-95, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-53, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

## Diagnosis Procedure

INFOID:0000000010119607

#### 1.REPLACE VCM

Replace the VCM due to malfunction in the electric shift control module built in VCM. Refer to EVC-423, "Removal and Installation".

>> END

# P18A4 CONTROL MODULE

## DTC Logic

INFOID:0000000010119608

### DTC DETECTION LOGIC

| DTC | CONSULT screen terms [Trouble diagnosis content] | DTC detection condition | Possible cause |
|---|---|---|---|
| P18A4 | CONTROL MODULE [Control Module (CPU) Error] | A malfunction is detected in the electric shift control module. | Electric shift control module |

### DTC CONFIRMATION PROCEDURE

#### 1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, power switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

#### 2.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Power switch OFF to ON and wait for 2 seconds or more.
2. Check DTC.

Is “P18A4” detected?

YES >> Go to TM-96, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-53, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

## Diagnosis Procedure

INFOID:0000000010119609

#### 1.REPLACE VCM

Replace the VCM due to malfunction in the electric shift control module built in VCM. Refer to EVC-423, "Removal and Installation".

>> END

# P18A7 SHIFT SIGNAL OFF

## DTC Logic

INFOID:0000000010119610

### DTC DETECTION LOGIC

| DTC | CONSULT screen terms (Trouble diagnosis content) | DTC detection condition | Possible cause |
|---|---|---|---|
| P18A7 | SHIFT SIGNAL OFF (Electric Shift Sensor Circuit) | It is detected that the states of all electric shift sensors No. 1 to No. 6 are OFF. | • Electric shift sensor<br>• Electric shift control module<br>• Harness or connectors (Each circuit is open or shorted.) |

Position Pattern Table

| Electric shift control module recognition position | Selector lever position | Electric shift sensor | | | | | |
|---|---|---|---|---|---|---|---|
| | | No. 1 | No. 2 | No. 3 | No. 4 | No. 5 | No. 6 |
| H | H | OFF | OFF | ON | OFF | OFF | ON |
| P | H | OFF | OFF | ON | OFF | OFF | ON |
| R | R | ON | ON | OFF | OFF | OFF | OFF |
| N | N | OFF | ON | ON | ON | OFF | OFF |
| D | D | OFF | OFF | OFF | ON | ON | OFF |

### DTC CONFIRMATION PROCEDURE

#### 1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, power switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

#### 2.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Set the vehicle to READY and wait for 5 seconds or more.
2. Check DTC.

Is “P18A7” detected?

YES >> Go to TM-97, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-53, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

## Diagnosis Procedure

INFOID:0000000010119611

#### 1.CHECK ELECTRIC SHIFT SENSOR INPUT SIGNAL

With CONSULT
1. Set the vehicle to READY.
2. Select “Data Monitor” in “SHIFT”.
3. Select “SHIFT SENSOR 1”, “SHIFT SENSOR 2”, “SHIFT SENSOR 3”, “SHIFT SENSOR 4”, “SHIFT SENSOR 5”, and “SHIFT SENSOR 6”.
4. Operate the selector lever to identify a electric shift sensor of which value does not change.

| Monitor item | Condition | Value / Status |
|---|---|---|
| SHIFT SENSOR 1 | Selector lever is held in R position | ON |
| | Other than the above | OFF |
| SHIFT SENSOR 2 | Selector lever is held in R and N positions | ON |
| | Other than the above | OFF |

| Monitor item | Condition | Value / Status |
|---|---|---|
| SHIFT SENSOR 3 | Selector lever is held in H (Home) and N positions | ON |
| | Other than the above | OFF |
| SHIFT SENSOR 4 | Selector lever is held in N and D positions | ON |
| | Other than the above | OFF |
| SHIFT SENSOR 5 | Selector lever is held in D position | ON |
| | Other than the above | OFF |
| SHIFT SENSOR 6 | Selector lever in H (Home) position | ON |
| | Other than the above | OFF |

Without CONSULT
1. Set the vehicle to READY.
2. Operate the selector lever.
3. Check the voltage between VCM vehicle side harness connector terminal and ground.

| Electric shift sensor | VCM | | Ground | Condition | Voltage (Approx.) |
|---|---|---|---|---|---|
| | Connector | terminal | | | |
| 1 | E61 | 17 | Ground | Selector lever is held in R position | 0 V |
| | | | | Other than the above | 5 V |
| 3 | | 16 | | Selector lever is held in H (Home) and N positions | 0 V |
| | | | | Other than the above | 5 V |
| 5 | | 3 | | Selector lever is held in D position | 0 V |
| | | | | Other than the above | 5 V |
| 2 | E62 | 84 | | Selector lever is held in R and N positions | 0 V |
| | | | | Other than the above | 5 V |
| 4 | | 85 | | Selector lever is held in N and D position | 0 V |
| | | | | Other than the above | 5 V |
| 6 | | 86 | | Selector lever in H (Home) position | 0 V |
| | | | | Other than the above | 5 V |

>> GO TO 2.

## 2.CHECK ELECTRIC SHIFT SENSOR POWER SUPPLY CIRCUIT

1. Power switch OFF.
2. Disconnect the electric shift sensor connector.
3. Power switch ON.
4. Check the power circuit of the malfunctioning electric shift sensor identified at Step 1.
5. Check the voltage between electric shift sensor vehicle side harness connector terminal and ground.

| Electric shift sensor | Electric shift sensor | | Ground | Voltage (Approx.) |
|---|---|---|---|---|
| | Connector | Terminal | | |
| 1, 3, 5 | M57 | 1 | Ground | 5 V |
| 2, 4, 6 | | 7 | | |

Is the inspection result normal?

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

## 3.CHECK HARNESS BETWEEN VCM AND ELECTRIC SHIFT SENSOR

1. Power switch OFF.
2. Disconnect the VCM connector.

3. Check the continuity between VCM vehicle side harness connector terminal and electric shift sensor vehicle side harness connector terminal.

| Electric shift sensor | VCM | | Electric shift sensor | | Continuity |
|---|---|---|---|---|---|
| | Connector | Terminal | Connector | Terminal | |
| 1, 3, 5 | E61 | 7 | M57 | 1 | Existed |
| 2, 4, 6 | E62 | 83 | | 7 | |

4. Check the continuity between VCM vehicle side harness connector terminal and ground.

| Electric shift sensor | VCM | | Ground | Continuity |
|---|---|---|---|---|
| | Connector | Terminal | | |
| 1, 3, 5 | E61 | 7 | Ground | Not existed |
| 2, 4, 6 | E62 | 83 | | |

Is the inspection result normal?

YES >> Replace the VCM due to malfunction in the electric shift control module built in VCM. Refer to EVC-423, "Removal and Installation".

NO >> Repair or replace damaged parts.

## 4. CHECK ELECTRIC SHIFT SENSOR GROUND CIRCUIT

1. Power switch OFF.
2. Disconnect the VCM connector.
3. Check the continuity between VCM vehicle side harness connector terminal and electric shift sensor vehicle side harness connector terminal.

| Electric shift sensor | VCM | | Electric shift sensor | | Continuity |
|---|---|---|---|---|---|
| | Connector | Terminal | Connector | Terminal | |
| 1, 3, 5 | E61 | 57 | M57 | 6 | Existed |
| 2, 4, 6 | E62 | 124 | | 12 | |

4. Check the continuity between VCM vehicle side harness connector terminal and ground.

| Electric shift sensor | VCM | | Ground | Continuity |
|---|---|---|---|---|
| | Connector | Terminal | | |
| 1, 3, 5 | E61 | 57 | Ground | Not existed |
| 2, 4, 6 | E62 | 124 | | |

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace damaged parts.

## 5. CHECK HARNESS BETWEEN VCM AND ELECTRIC SHIFT SENSOR

1. Check the continuity between VCM vehicle side harness connector terminal and electric shift sensor vehicle side harness connector terminal.

| Electric shift sensor | VCM | | Electric shift sensor | | Continuity |
|---|---|---|---|---|---|
| | Connector | terminal | Connector | terminal | |
| 1 | E61 | 17 | M57 | 11 | Existed |
| 3 | | 16 | | 10 | |
| 5 | | 3 | | 9 | |
| 2 | E62 | 84 | | 5 | |
| 4 | | 85 | | 3 | |
| 6 | | 86 | | 4 | |

2. Check the continuity between VCM vehicle side harness connector terminals and ground.

| Electric shift sensor | VCM | | Ground | Continuity |
|---|---|---|---|---|
| | Connector | terminal | | |
| 1 | E61 | 17 | Ground | Not existed |
| 3 | | 16 | | |
| 5 | | 3 | | |
| 2 | E62 | 84 | | |
| 4 | | 85 | | |
| 6 | | 86 | | |

Is the inspection result normal?

YES >> Replace the electric shift sensor. Refer to TM-122, "Disassembly and Assembly".
NO >> Repair or replace damaged parts.

# P18A8 P POSITION SWITCH

## DTC Logic

INFOID:0000000010119612

### DTC DETECTION LOGIC

| DTC | CONSULT screen terms (Trouble diagnosis content) | DTC detection condition | Possible cause |
|---|---|---|---|
| P18A8 | P POSITION SWITCH (P Position Switch Error) | P position switches No. 1 and No. 2 are stuck at OFF. | • P position switch<br>• Harness (Each circuit is open or shorted.) |
| | | P position switch No. 1 is stuck at ON and P position switch No. 2 is stuck at OFF. | |

P Position Switch Pattern Table

| Electric shift control module recognition position | Selector lever position | P position SW | Electric shift sensor | | | | | | P position SW | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | No. 1 | No. 2 | No. 3 | No. 4 | No. 5 | No. 6 | No. 1 | No. 2 |
| H | H | No push | OFF | OFF | ON | OFF | OFF | ON | OFF | ON |
| P | H | Push | OFF | OFF | ON | OFF | OFF | ON | ON | OFF |
| R | R | No push | ON | ON | OFF | OFF | OFF | OFF | OFF | ON |
| N | N | No push | OFF | ON | ON | ON | OFF | OFF | OFF | ON |
| D | D | No push | OFF | OFF | OFF | ON | ON | OFF | OFF | ON |

### DTC CONFIRMATION PROCEDURE

#### 1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, power switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

#### 2.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Set the vehicle to READY.
2. Press the P position switch to shift to P position and wait for 5 seconds or more. (Be sure to press the P position switch for 1 second or more.)
3. Shift the selector lever to N position and wait for 5 minutes or more.
4. Check DTC.

Is “P18A8” detected?

YES >> Go to TM-101, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-53, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

## Diagnosis Procedure

INFOID:0000000010119613

#### 1.CHECK HARNESS BETWEEN VCM AND ELECTRIC SHIFT SENSOR

1. Power switch OFF.
2. Disconnect the VCM connector.
3. Disconnect the electric shift sensor connector.
4. Check the continuity between VCM vehicle side harness connector terminals and electric shift sensor vehicle side harness connector terminals.

| VCM | | Electric shift sensor | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| E62 | 99 | M57 | 2 | Existed |
| | 112 | | 8 | |

5. Check the continuity between VCM vehicle side harness connector terminals and ground.

| VCM | | Ground | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| E62 | 99 | Ground | Not existed |
| | 112 | | |

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace damaged parts.

## 2.CHECK P POSITION SWITCH

Check the P position switch. Refer to TM-102, "Component Inspection (P Position Switch)".

Is the inspection result normal?

YES >> Replace the electric shift sensor. Refer to TM-121, "Exploded View".
NO >> Replace the selector lever knob due to malfunction in the P position switch. Refer to TM-121, "Removal and Installation".

# Component Inspection (P Position Switch)

INFOID:0000000010119614

## 1.CHECK P POSITION SWITCH

1. Disconnect the P position switch connector.
2. Check the continuity between P position swiitch connector terminal.

| P position switch connector | | Condition | Continuity |
|---|---|---|---|
| Terminal | | | |
| 1 | 3 | When P position switch is depressed | Not existed |
| | | When P position switch is released | Existed |
| 2 | 3 | When P position switch is depressed | Existed |
| | | When P position switch is released | Not existed |

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace the selector lever knob due to malfunction in the P position switch. Refer to TM-121, "Removal and Installation".

# P18A9 PARKING ACTUATOR FUNCTION

## DTC Logic

INFOID:0000000010119615

### DTC DETECTION LOGIC

| DTC | CONSULT screen terms (Trouble diagnosis content) | DTC detection condition | Possible cause |
|---|---|---|---|
| P18A9 | PARKING ACTUATOR FUNCTION (Parking Actuator Function) | It is detected that the output of the parking actuator does not stop. | Parking actuator |

### DTC CONFIRMATION PROCEDURE

#### 1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, power switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

#### 2.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Set the vehicle to READY.
2. Shift the selector lever to N position and wait for 10 seconds or more.
3. Press the P position switch to shift to P position and wait for 10 seconds or more.
4. Check DTC.

Is “P18A9” detected?

YES >> Go to TM-103, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-53, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

## Diagnosis Procedure

INFOID:0000000010119616

#### 1.REPLACE REDUCTION GEAR

Replace the reduction gear due to malfunction in the parking actuator. Refer to TM-21, "Removal and Installation".

>> END

# P18AB IGNITION SWITCH

## DTC Logic

INFOID:0000000010119617

### DTC DETECTION LOGIC

| DTC | CONSULT screen terms (Trouble diagnosis content) | DTC detection condition | Possible cause |
|---|---|---|---|
| P18AB | IGNITION SWITCH (IGN switch Circuit) | It is detected that the power switch input terminal values from the 2 lines do not match each other. | • Power switch<br>• Harness, fuse, or connectors (Each circuit is open or shorted.) |

### DTC CONFIRMATION PROCEDURE

#### 1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, power switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

#### 2.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Power switch ON and wait for 5 seconds or more.
2. Check DTC.

Is “P18AB” detected?

YES >> Go to TM-104, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-53, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

## Diagnosis Procedure

INFOID:0000000010119618

#### 1.CHECK VCM POWER SUPPLY CIRCUIT

1. Power switch OFF.
2. Disconnect the VCM connector.
3. Check the voltage between VCM vehicle side harness connector terminals and ground.

| VCM | | Ground | Condition | Voltage (Approx.) |
|---|---|---|---|---|
| Connector | Terminal | | | |
| E61 | 51 | Ground | Power switch ON | 9 – 16 V |
| | | | Power switch OFF | 0 V |
| E62 | 74 | | Power switch ON | 9 – 16 V |
| | | | Power switch OFF | 0 V |

Which terminal value is abnormal?

YES >> INSPECTION END
NO >> GO TO 2.

#### 2.DETECT MALFUNCTION ITEMS

Check the following items.
- Harness for short or open between IPDM E/R vehicle side harness connector terminal 57 and VCM vehicle side harness connector terminal 51.
- IPDM E/R
- 12V battery
- Ignition relay
- 10A fuse (#55, IPDM E/R) (Refer to PG-87, "How To Check".)
- Harness for short or open between power switch and VCM vehicle side harness connector terminal 74.
- Power switch

• 15A fuse (#6) (Refer to PG-87, "How To Check".)

Is the inspection result normal?

YES >> INSPECTION END
NO >> Repair or replace damaged parts.

# P18AC PARKING ACTUATOR RELAY A

## DTC Logic

INFOID:0000000010119619

### DTC DETECTION LOGIC

| DTC | CONSULT screen terms (Trouble diagnosis content) | DTC detection condition | Possible cause |
|---|---|---|---|
| P18AC | PARKING ACTUATOR RELAY A (Parking Actuator Relay A Circuit) | In spite of the parking actuator relay A OFF, voltage is detected from the U phase, V phase and W phase of motor coil A. | • Parking actuator relay A (ON stuck)<br>• Electric shift control module<br>• Harness (Ground short) |

### DTC CONFIRMATION PROCEDURE

#### 1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, power switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

#### 2.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Power switch ON and wait for 2 seconds or more.
2. Check DTC.

Is “P18AC” detected?

YES >> Go to TM-106, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-53, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

## Diagnosis Procedure

INFOID:0000000010119620

#### 1.CHECK HARNESS BETWEEN VCM AND PARKING ACTUATOR RELAY A

1. Disconnect the VCM connector.
2. Disconnect the parking actuator relay A.
3. Check the continuity between parking actuator relay A vehicle side harness connector terminal and ground.

| Parking actuator relay A | | Ground | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| E54 | 2 | Ground | Not existed |

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace damaged parts.

#### 2.CHECK HARNESS BETWEEN PARKING ACTUATOR AND PARKING ACTUATOR RELAY A

1. Disconnect the parking actuator connector.
2. Check the voltage between parking actuator vehicle side harness connector terminal and ground.

| Parking actuator | | Ground | Voltage (Approx.) |
|---|---|---|---|
| Connector | Terminal | | |
| F4 | 2 | Ground | 0 V |

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace damaged parts.

## 3.CHECK HARNESS BETWEEN VCM AND PARKING ACTUATOR

Check the voltage between VCM vehicle side harness connector terminals and ground.

| VCM | | Ground | Voltage (Approx.) |
|---|---|---|---|
| Connector | Terminal | | |
| E61 | 1 | Ground | 0 V |
| | 13 | | |
| | 39 | | |

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace damaged parts.

## 4.CHECK PARKING ACTUATOR RELAY A

Check the parking actuator relay A. Refer to TM-107, "Component Inspection (Parking Actuator Relay A)".

Is the inspection result normal?

YES >> Replace the VCM due to malfunction in the electric shift control module built in VCM. Refer to EVC-423, "Removal and Installation".
NO >> Replace the parking actuator relay A. Refer to TM-32, "Component Parts Location".

# Component Inspection (Parking Actuator Relay A)

INFOID:0000000010119621

## 1.CHECK PARKING ACTUATOR RELAY A

1. Disconnect the parking actuator relay A. Refer to TM-32, "Component Parts Location".
2. Apply 12 V direct current between parking actuator relay A terminals 1 and 2.
   **CAUTION:**
   - **Never make the terminals short.**
   - **Connect the fuse between the terminals when applying the voltage.**
3. Check the continuity between parking actuator relay A terminals 3 and 5.

| Parking actuator relay A | | Condition | Continuity |
|---|---|---|---|
| Terminal | | | |
| 3 | 5 | Apply 12 V direct current between terminals 1 and 2. | Existed |
| | | Does not apply 12 V direct current between terminals 1 and 2. | Not existed |

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace the parking actuator relay A.

# P18AE STUCK IN SHIFT

## DTC Logic

INFOID:0000000010119622

### DTC DETECTION LOGIC

| DTC | CONSULT screen terms (Trouble diagnosis content) | DTC detection condition | Possible cause |
|---|---|---|---|
| P18AE | STUCK IN SHIFT (Medium Stuck In Shift) | It is detected that the parking actuator does not move at the midpoint of the manual plate after the parking actuator stops the operation. | Parking actuator (Parking mechanism) |

### DTC CONFIRMATION PROCEDURE

**CAUTION:**

**"TM-108, "Diagnosis Procedure"" must be performed before starting "DTC CONFIRMATION PROCEDURE" .**

**1.** PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, power switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

**2.** PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Set the vehicle to READY.
2. Select "Data Monitor" in "SHIFT".
3. Select "RANGE POSITION".
4. Shift the selector lever as follows.

- P → N → P

5. Repeat step 4 five more times.
6. Check DTC.

Is "P18AE" detected?

YES >> Go to TM-108, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-53, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

## Diagnosis Procedure

INFOID:0000000010119623

**1.** REPLACE REDUCTION GEAR

Replace the reduction gear due to malfunction in the parking actuator. Refer to TM-21, "Removal and Installation".

>> END

# P18AF CONTROL MODULE

## DTC Logic

INFOID:0000000010119624

### DTC DETECTION LOGIC

| DTC | CONSULT screen terms (Trouble diagnosis content) | DTC detection condition | Possible cause |
|---|---|---|---|
| P18AF | CONTROL MODULE (Control Module) | A malfunction is detected in the electric shift control module. | Electric shift control module |

### DTC CONFIRMATION PROCEDURE

#### 1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, power switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

#### 2.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Power switch OFF to ON and wait for 2 seconds or more.
2. Check DTC.

Is “P18AF” detected?

YES >> Go to TM-109, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-53, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

## Diagnosis Procedure

INFOID:0000000010119625

#### 1.REPLACE VCM

Replace the VCM due to malfunction in the electric shift control module built in VCM. Refer to EVC-423, "Removal and Installation".

>> END

# P18B0 CONTROL MODULE

## DTC Logic

INFOID:0000000010119626

### DTC DETECTION LOGIC

| DTC | CONSULT screen terms (Trouble diagnosis content) | DTC detection condition | Possible cause |
|---|---|---|---|
| P18B0 | CONTROL MODULE (Control Module) | A malfunction is detected in the electric shift control module. | Electric shift control module |

### DTC CONFIRMATION PROCEDURE

#### 1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, power switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

#### 2.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Power switch OFF to ON and wait for 2 seconds or more.
2. Check DTC.

Is “P18B0” detected?

YES >> Go to TM-110, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-53, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

## Diagnosis Procedure

INFOID:0000000010119627

#### 1.REPLACE VCM

Replace the VCM due to malfunction in the electric shift control module built in VCM. Refer to EVC-423, "Removal and Installation".

>> END

# P18B1 CONTROL MODULE

## DTC Logic

INFOID:0000000010119628

### DTC DETECTION LOGIC

| DTC | CONSULT screen terms (Trouble diagnosis content) | DTC detection condition | Possible cause |
|---|---|---|---|
| P18B1 | CONTROL MODULE (Control Module) | A malfunction is detected in the electric shift control module. | Electric shift control module |

### DTC CONFIRMATION PROCEDURE

#### 1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, power switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

#### 2.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Power switch OFF to ON and wait for 2 seconds or more.
2. Check DTC.

Is “P18B1” detected?

YES >> Go to TM-111, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-53, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

## Diagnosis Procedure

INFOID:0000000010119629

#### 1.REPLACE VCM

Replace the VCM due to malfunction in the electric shift control module built in VCM. Refer to EVC-423, "Removal and Installation".

>> END

# P18B2 CONTROL MODULE

## DTC Logic

INFOID:0000000010119630

### DTC DETECTION LOGIC

| DTC | CONSULT screen terms (Trouble diagnosis content) | DTC detection condition | Possible cause |
|---|---|---|---|
| P18B2 | CONTROL MODULE (Control Module) | A malfunction is detected in the electric shift control module. | Electric shift control module |

### DTC CONFIRMATION PROCEDURE

#### 1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, power switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

#### 2.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Power switch OFF to ON and wait for 2 seconds or more.
2. Check DTC.

Is “P18B2” detected?

YES >> Go to TM-112, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-53, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

## Diagnosis Procedure

INFOID:0000000010119631

#### 1.REPLACE VCM

Replace the VCM due to malfunction in the electric shift control module built in VCM. Refer to EVC-423, "Removal and Installation".

>> END

# U1000 CAN COMM CIRCUIT

## DTC Logic

INFOID:0000000010119632

### DTC DETECTION LOGIC

| DTC | CONSULT screen terms (Trouble diagnosis content) | DTC detection condition | Possible cause |
|---|---|---|---|
| U1000 | CAN COMM CIRCUIT (CAN communication line) | Electric shift control module cannot transmit or receive CAN communication signals when the power switch is ON. | Harness or connectors (CAN communication line is open or shorted.) |

### DTC CONFIRMATION PROCEDURE

#### 1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, power switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

#### 2.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Power switch ON and wait for 5 seconds or more.
2. Check DTC.

Is “U1000” detected?

YES >> Go to TM-113, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-53, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

## Diagnosis Procedure

INFOID:0000000010119633

Go to LAN-17, "Trouble Diagnosis Flow Chart".

# U1010 CONTROL UNIT (CAN)

## DTC Logic

INFOID:0000000010119634

### DTC DETECTION LOGIC

| DTC | CONSULT screen terms (Trouble diagnosis content) | DTC detection condition | Possible cause |
|---|---|---|---|
| U1010 | CONTROL UNIT (CAN) (Control Module Malfunction) | Malfunction is detected in the CAN communication initial diagnosis (control module malfunction). | Electric shift control module |

### DTC CONFIRMATION PROCEDURE

#### 1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, power switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

#### 2.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Power switch OFF to ON and wait for 5 seconds or more.
2. Check DTC.

Is “U1010” detected?

YES >> Go to TM-114, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-53, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

## Diagnosis Procedure

INFOID:0000000010119635

#### 1.REPLACE VCM

Replace the VCM due to malfunction in the electric shift control module built in VCM. Refer to EVC-423, "Removal and Installation".

>> END

# U1086 CAN ERROR

## DTC Logic

INFOID:0000000010119636

### DTC DETECTION LOGIC

| DTC | CONSULT screen terms (Trouble diagnosis content) | DTC detection condition | Possible cause |
|---|---|---|---|
| U1086 | CAN ERROR (CAN Error) | The inability to transmit or receive data is detected after the power switch is turned OFF. | Electric shift control module |

### DTC DETECTION LOGIC

#### 1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, power switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

#### 2.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Power switch OFF to ON and wait for 5 seconds or more.
2. Check DTC.

Is “U1086” detected?

YES >> Go to TM-115, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-53, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

## Diagnosis Procedure

INFOID:0000000010119637

Go to LAN-17, "Trouble Diagnosis Flow Chart".

# SELECTOR INDICATOR CIRCUIT

## Component Function Check

INFOID:0000000010119638

### 1.CHECK SELECTOR INDICATOR FUNCTION

1. Set the vehicle to READY.
2. Shift the selector lever.
3. Check that the illuminated position of the selector indicator in the finisher area corresponds to the selected shift position.

Is the inspection result normal?

YES >> GO TO 2.
NO >> Go to TM-116, "Diagnosis Procedure".

### 2.CHECK SELECTOR INDICATOR ILLUMINATION FUNCTION

1. Turn ON the headlamp.
2. Check selector indicator illumination lights up.

Is the inspection result normal?

YES >> INSPECTION END
NO >> Go to TM-116, "Diagnosis Procedure".

## Diagnosis Procedure

INFOID:0000000010119639

### 1.DETECT MALFUNCTION

Which is malfunctioning part?

Selector indicator illumination>>GO TO 2.
Selector indicator>>GO TO 7.

### 2.CHECK SELECTOR INDICATOR ILLUMINATION POWER SUPPLY-1

1. Turn OFF the headlamp.
2. Turn ignition switch OFF.
3. Disconnect selector indicator harness connector.
4. Turn ignition switch ON.
5. Turn ON the headlamp.
6. Check the voltage between selector indicator vehicle side harness connector terminals.

| Selector indicator | | | Voltage |
|---|---|---|---|
| Connector | + | – | |
| | Terminal | | |
| M56 | 5 | 4 | 9 – 16 V |

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-53, "Intermittent Incident". If OK, replace selector indicator. Refer to TM-125, "Removal and Installation".
NO >> GO TO 3.

### 3.CHECK SELECTOR INDICATOR ILLUMINATION POWER SUPPLY-2

Check the voltage between selector indicator vehicle side harness connector and ground.

| + | | – | Voltage |
|---|---|---|---|
| Selector indicator | | | |
| Connector | Terminal | | |
| M56 | 5 | Ground | 9 – 16 V |

Is the inspection result normal?

YES >> GO TO 6.
NO >> GO TO 4.

## 4.CHECK FUSE

1. Turn OFF the headlamp.
2. Turn ignition switch OFF.
3. Pull out #46 fuse. Refer to PG-87, "How To Check".)
4. Check that the fuse is not fusing.

Is the inspection result normal?

YES >> GO TO 5.
NO >> Replace the fuse after repair the applicable circuit.

## 5.CHECK CIRCUIT BETWEEN SELECTOR INDICATOR AND IPDM E/R

1. Disconnect IPDM E/R harness connector.
2. Check the continuity between IPDM E/R vehicle side harness connector and selector indicator vehicle side harness connector.

| + | | – | | Continuity |
|---|---|---|---|---|
| IPDM E/R | | Selector indicator | | |
| Connector | Terminal | Connector | Terminal | |
| E14 | 38 | M56 | 5 | Existed |

3. Also check harness for short to ground.

Is the inspection result normal?

YES >> Perform IPDM E/R auto active test and check tail lamp relay operation. Refer to PCS-11, "Diagnosis Description".
NO >> Repair or replace damaged parts.

## 6.CHECK GROUND CIRCUIT

1. Turn OFF the headlamp.
2. Turn ignition switch OFF.
3. Disconnect combination meter harness connector.
4. Check the continuity between combination meter vehicle side harness connector and selector indicator vehicle side harness connector.

| Combination meter | | Selector indicator | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M34 | 26 | M56 | 4 | Existed |

Is the inspection result normal?

YES >> Check the combination meter. Refer to MWI-54, "Reference Value".
NO >> Repair or replace damaged parts.

## 7.CHECK SELECTOR INDICATOR POWER SUPPLY CIRCUIT

1. Disconnect the selector indicator connector.
2. Check the voltage between selector indicator vehicle side harness connector terminal and ground.

| Selector indicator | | Ground | Voltage |
|---|---|---|---|
| Connector | Terminal | | |
| M56 | 2 | Ground | 9 – 16 V |

Is the inspection result normal?

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

## 8.DETECT MALFUNCTION ITEMS

Check the following items.
- 10A fuse (#12) (Refer to PG-87, "How To Check".)
- 12V battery
- Harness for short or open between selector indicator vehicle side harness connector and 12V battery.

>> Repair or replace damaged parts.

## 9. CHECK HARNESS BETWEEN VCM AND SELECTOR INDICATOR

1. Disconnect the VCM connector.
2. Check the continuity between VCM vehicle side harness connector terminals and selector indicator vehicle side harness connector terminals.

| VCM | | Selector indicator | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| E61 | 18 | M56 | 1 | Existed |
| | 33 | | 7 | |
| | 34 | | 8 | |
| | 46 | | 3 | |

3. Check the continuity between VCM vehicle side harness connector terminals and ground.

| VCM | | Ground | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| E61 | 18 | Ground | Not existed |
| | 33 | | |
| | 34 | | |
| | 46 | | |

Is the inspection result normal?

YES >> GO TO 10.
NO >> Repair or replace damaged parts.

## 10. CHECK GROUND CIRCUIT

Check the continuity between VCM vehicle side harness connector terminals and ground.

| VCM | | Ground | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| E61 | 58 | Ground | Existed |
| | 65 | | |
| E62 | 118 | | |
| | 126 | | |

Is the inspection result normal?

YES >> Replace the selector indicator. Refer to TM-125, "Removal and Installation".
NO >> Repair or replace damaged parts.

# SHIFT POSITION INDICATOR CIRCUIT

## Component Function Check

INFOID:0000000010119640

### 1.CHECK SHIFT POSITION INDICATOR

1. Set the vehicle to READY.
2. Shift the selector lever.
3. Check that the indication of the shift position indicator in the combination meter corresponds to the selected shift position.

Is the inspection result normal?

YES >> INSPECTION END
NO >> Go to TM-119, "Diagnosis Procedure".

## Diagnosis Procedure

INFOID:0000000010119641

### 1.CHECK DTC OF ELECTRIC SHIFT CONTROL MODULE

With CONSULT
1. Power switch ON.
2. Perform “Self Diagnostic Results” in “SHIFT”.

Is any DTC detected?

YES >> Check DTC detected item. Refer to TM-50, "DTC Index".
NO >> GO TO 2.

### 2.CHECK DTC OF VCM

With CONSULT
1. Power switch ON.
2. Perform “Self Diagnostic Results” in “EV/HEV”.

Is any DTC detected?

YES >> Check DTC detected item. Refer to EVC-102, "DTC Index".
NO >> GO TO 3.

### 3.CHECK DTC OF COMBINATION METER

With CONSULT
1. Power switch ON.
2. Perform “Self Diagnostic Results” in “METER”.

Is any DTC detected?

YES >> Check DTC detected item. Refer to MWI-65, "DTC Index".
NO >> Check input/output signals of combination meter. Refer to MWI-54, "Reference Value".

# ELECTRIC SHIFT WARNING LAMP

## Component Function Check

INFOID:0000000010119642

### 1.CHECK ELECTRIC SHIFT WARNING LAMP

Check that electric shift warning lamp turns ON for approx. 2 seconds after power switch is ON.

Is the inspection result normal?

YES >> INSPECTION END
NO >> Go to TM-120, "Diagnosis Procedure".

## Diagnosis Procedure

INFOID:0000000010119643

### 1.CHECK DTC OF ELECTRIC SHIFT CONTROL MODULE

With CONSULT
1. Power switch ON.
2. Perform “Self Diagnostic Results” in “SHIFT”.

Is any DTC detected?

YES >> Check DTC detected item. Refer to TM-50, "DTC Index".
NO >> GO TO 2.

### 2.CHECK DTC OF VCM

With CONSULT
1. Power switch ON.
2. Perform “Self Diagnostic Results” in “EV/HEV”.

Is any DTC detected?

YES >> Check DTC detected item. Refer to EVC-102, "DTC Index".
NO >> 1. Check input/output signals of VCM. Refer to EVC-84, "Reference Value".
2. If inspection result is OK, GO TO 3.

### 3.CHECK DTC OF COMBINATION METER

With CONSULT
1. Power switch ON.
2. Perform “Self Diagnostic Results” in “METER”.

Is any DTC detected?

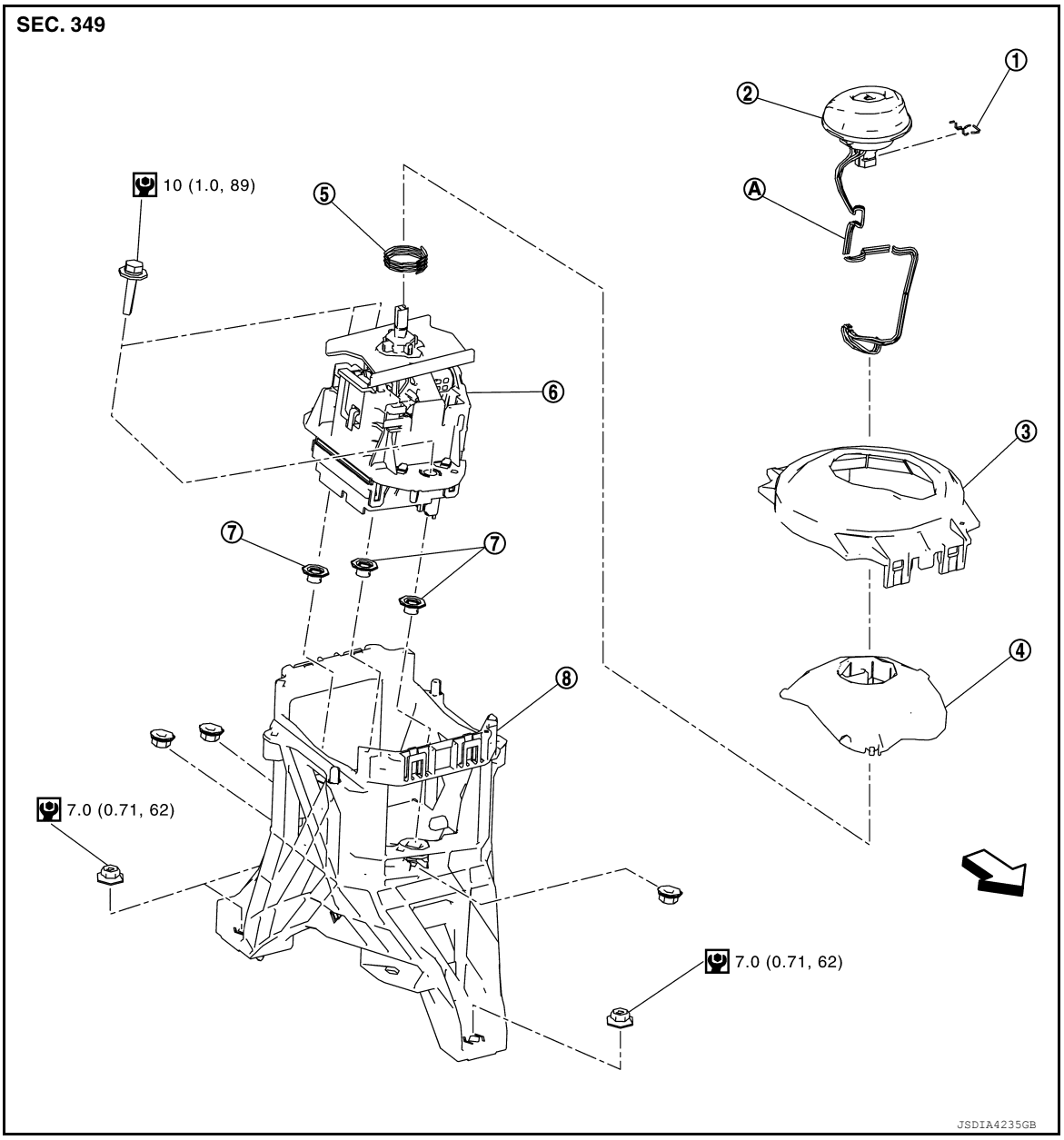
YES >> Check DTC detected item. Refer to MWI-65, "DTC Index".
NO >> Check input/output signals of combination meter. Refer to MWI-54, "Reference Value".

# REMOVAL AND INSTALLATION

## ELECTRIC SHIFT SELECTOR

### Exploded View

INFOID:0000000010119644



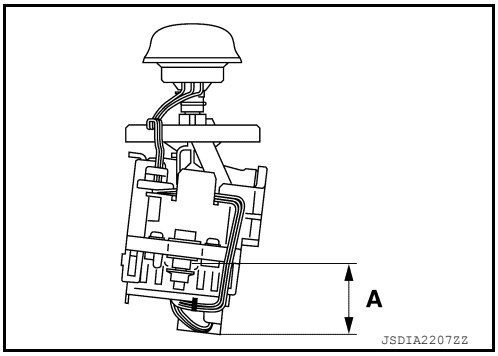

| | | |
|---|---|---|
| ① Lock pin | ② Selector lever knob | ③ Shift gate |
| ④ Slider plate | ⑤ Spring | ⑥ Electric shift sensor |
| ⑦ Collar | ⑧ Body bracket | |
| Ⓐ P position switch harness | | |
| ⇦ : Vehicle front | | |
| : N·m (kg-m, in-lb) | | |

### Removal and Installation

INFOID:0000000010119645

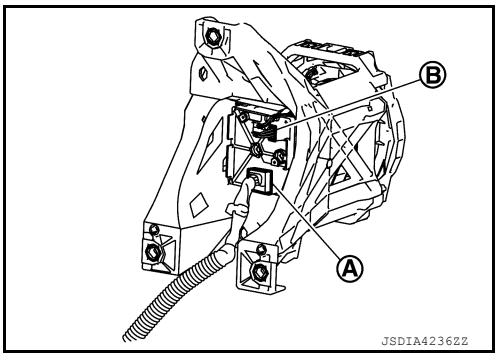
**CAUTION:**

- **As part A in the figure contains a strong magnet, persons with an electro-medical apparatus should keep it away from his/her body. Otherwise it may cause the electro-medical apparatus to malfunction.**
- **Keep it away from magnetic objects such as magnetic cards and metal products (e.g. watches).**
- **Never subject the electric shift selector to impact by dropping or hitting, water splash or high humidity.**




REMOVAL

1. Disconnect the negative cable from 12V battery. Refer to TM-29, "Precautions for Removing Battery Terminal".
2. Remove the console finisher assembly. Refer to IP-28, "Exploded View".
3. Disconnect the selector indicator connector.
4. Remove the console body assembly. Refer to IP-28, "Exploded View".
5. Remove body harness clip from electric shift selector.
6. Remove electric shift selector fix bolts.
7. Disconnect the electric shift sensor connector Ⓐ.
   **CAUTION:**
   **Never disconnect the P position switch connector Ⓑ.**
8. Remove the electric shift selector from the vehicle.




INSTALLATION

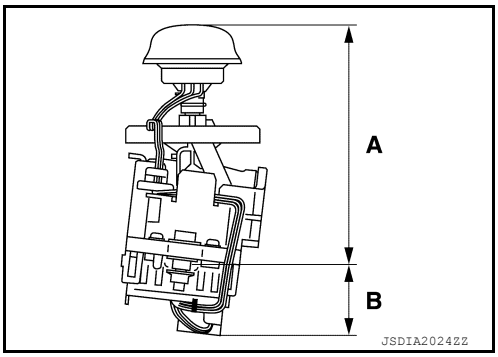
Note the following, and install in the reverse order of removal.

## Disassembly and Assembly

INFOID:0000000010119646

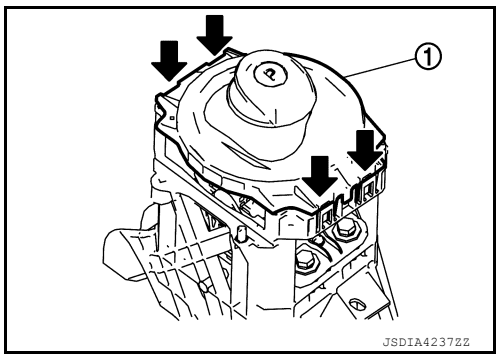
**CAUTION:**

- **As part B in the figure contains a strong magnet, persons with an electro-medical apparatus should keep it away from his/her body. Otherwise it may cause the electro-medical apparatus to malfunction.**
- **Keep it away from magnetic objects such as magnetic cards and metal products (e.g. watches).**
- **When holding the electric shift sensor, hold part A in the figure.**
- **Never disassemble parts A or B shown in the figure.**
- **Never subject the electric shift sensor to impact by dropping or hitting, water splash or high humidity.**

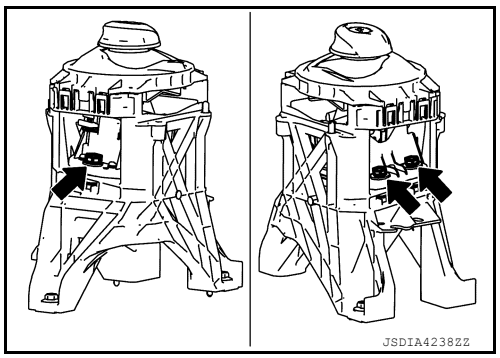



DISASSEMBLY

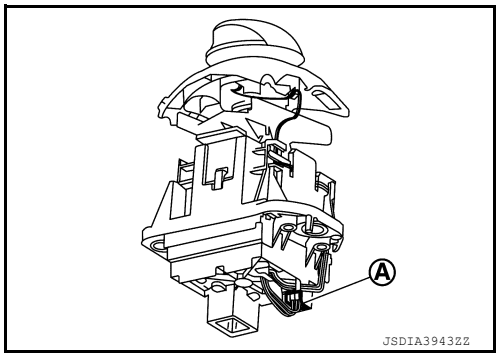
1. Remove the shift gate ① from body bracket.
**CAUTION:**
- **Be careful not to damage the joint (pawls shown by arrow).**
- **Lifting the shift gate with the selector lever in home position may cause interference between selector lever and shift gate and result in damage. To prevent this, tilt the selector lever slightly toward N position during the removal.**



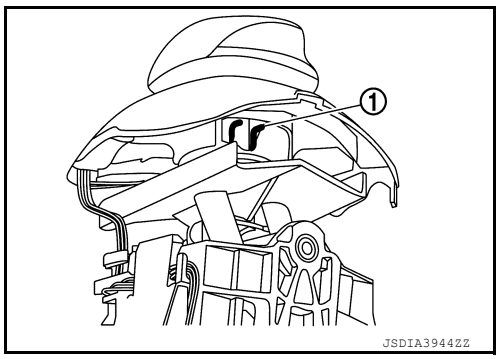

2. Remove electric shift sensor fix bolts (⬅).
3. Remove the electric shift sensor from body bracket.
4. Put a mark at the hook position of the P position switch harness.
**CAUTION:**
**Memorize how the P position switch harness is routed.**




5. Disconnect the P position switch connector Ⓐ.
6. Remove P position switch harness from hook.



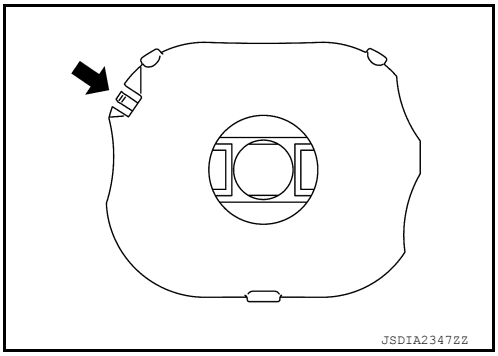

7. Pull the lock pin ① out of the selector lever using long-nose pliers.
**CAUTION:**
**Be careful not to lose the lock pin.**
8. Pull the selector lever knob upward out of the vehicle.
9. Remove the slider plate.
10. Remove the spring.




## ASSEMBLY

Note the following, and install in the reverse order of removal.
- Install the lock pin to the selector knob before assembly.
- Check that lock pin is securely installed.

- To install slide plate, face the arrow (harness hook) shown in the figure toward the front of the vehicle.
- Hook the P position switch harness at the marked position.




## Inspection

INFOID:0000000010119647

### INSPECTION AFTER INSTALLATION

- Pull the selector lever knob upward to check that it does not come off.
- Shift the selector lever and check that the indication of the selector indicator (in the finisher area) and the shift position indicator (in the combination meter) correspond to the actual shift position.
- Check that the shift operation can be performed properly. Refer to TM-34, "Electric Shift Selector".

# SELECTOR INDICATOR

## Removal and Installation

INFOID:0000000010119648

### REMOVAL

1. Remove the console finisher assembly. Refer to IP-28, "Exploded View".
2. Disconnect the selector indicator connector.
3. Remove the selector indicator from the console finisher assembly.

### INSTALLATION

Installation is the reverse order of removal.

## Inspection

INFOID:0000000010119649

### INSPECTION AFTER INSTALLATION

Shift the selector lever and check that the light position of the selector indicator corresponds to the actual shift position.