

# VC

## SECTION

### VEHICLE CHARGING SYSTEM

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# PRECAUTIONS

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## PRECAUTION

### PRECAUTIONS

#### Precaution for Technicians Using Medical Electric

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##### 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:000000008746415

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:000000009347093

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

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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

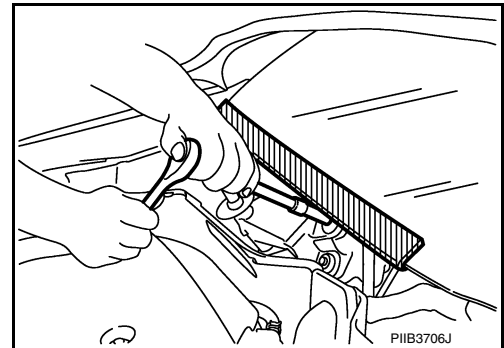
### **WARNING:**

- 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

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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 of Battery Terminal

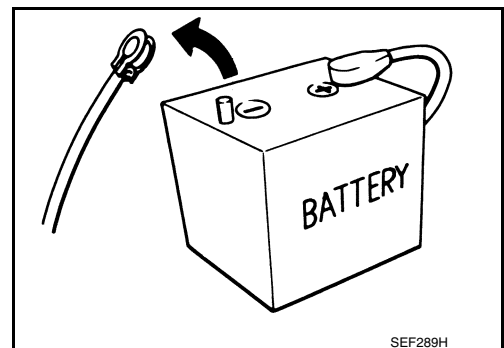
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- When removing the 12V battery terminal, turn OFF the power switch and wait at least 5 minutes.

### **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:**

# PRECAUTIONS

## < PRECAUTION >

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.

## High Voltage Precautions

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### **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"

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

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

**Person in charge:**\_\_\_\_\_

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# PREPARATION

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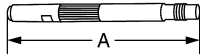
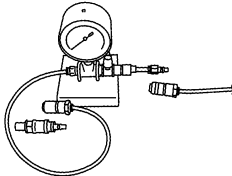
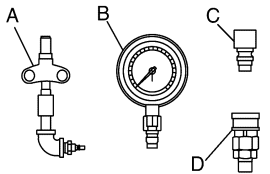
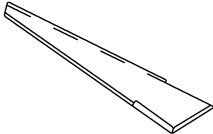
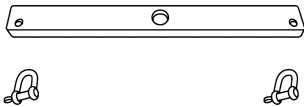
## PREPARATION

### PREPARATION

#### Special Service Tools

INFOID:000000009296973

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

Tool number (TechMate No.) Tool name	Description
KV99112300 (J - 51050) Guide pin  JPCIA0332ZZ	Removing and installing the PDM (Power Delivery Module) 3 pins/set A: 106 mm (4.17 in) / 1 pin 96 mm (3.78 in) / 2 pins
KV99111400 (J - 50378) Air leak tester  JSCIA0257ZZ	When checking air leaks after disassembling/assembling Li-ion battery.
KV99112400 (J - 51051) Air leak tester A: Attachment B: 25 kPa pressure gauge C: Male coupler D: Female coupler for base mounting  JPCIA0351ZZ	Air leak test following disassembly and re-assembly of the PDM (Power Delivery Module)
KV10120900 (J - 51053) Acrylic scraper  JPCIA0335ZZ	Removing liquid gasket
KV99112200 (J - 51049) Slinger <b>NOTE:</b> The slinger comes as a set with 2 shackles.  JPCIA0373ZZ	Supporting and hoisting the PDM (Power Delivery Module)

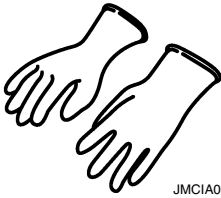
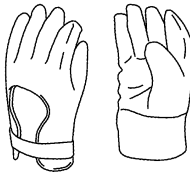
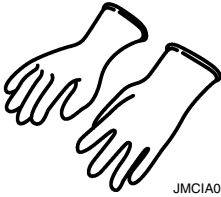

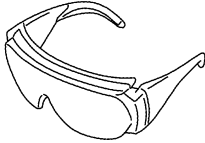
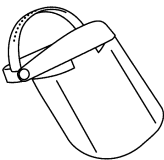


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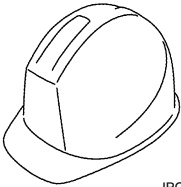
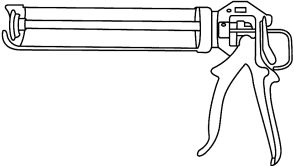
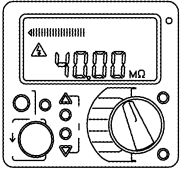
## Commercial Service Tools

INFOID:000000008746420

Tool name	Description
Insulated gloves  <small>JMCIA0149ZZ</small>	Removing and installing high voltage components [Guaranteed insulation performance for 1000V/300A]
Leather gloves  <small>JPCIA0066ZZ</small>	<ul style="list-style-type: none"> <li>• Removing and installing high voltage components</li> <li>• Protect insulated gloves</li> </ul> [Use leather gloves that can fasten the wrist tight]
Anti-static gloves  <small>JMCIA0149ZZ</small>	<ul style="list-style-type: none"> <li>• Gloves for preventing static electricit</li> <li>• Disassembly and reassembly of the PDM (Power Delivery Module)</li> </ul>
Insulated safety shoes  <small>JPCIA0011ZZ</small>	Removing and installing high voltage components
Safety glasses  <small>JPCIA0012ZZ</small>	<ul style="list-style-type: none"> <li>• Removing and installing high voltage components</li> <li>• To protect eye from the spatter on the work to electric line</li> </ul> [ANSI Z87.1]
Face shield  <small>JPCIA0167ZZ</small>	<ul style="list-style-type: none"> <li>• Removing and installing high voltage components</li> <li>• To protect face from the spatter on the work to electric line</li> </ul>

# PREPARATION

## < PREPARATION >

Tool name	Description
<p>Insulated helmet</p>  <p>JPCIA0013ZZ</p>	<p>Removing and installing high voltage components</p>
<p>Tube presser [Gasket material applicator]</p>  <p>JSCIA0639ZZ</p>	<p>Installing PDM (Power Delivery Module) cover (Apply the liquid gasket)</p>
<p>Insulation resistance tester (Multi tester)</p>  <p>JPCIA0014ZZ</p>	<p>Measuring insulation resistance, voltage, and resistance</p>

# COMPONENT PARTS

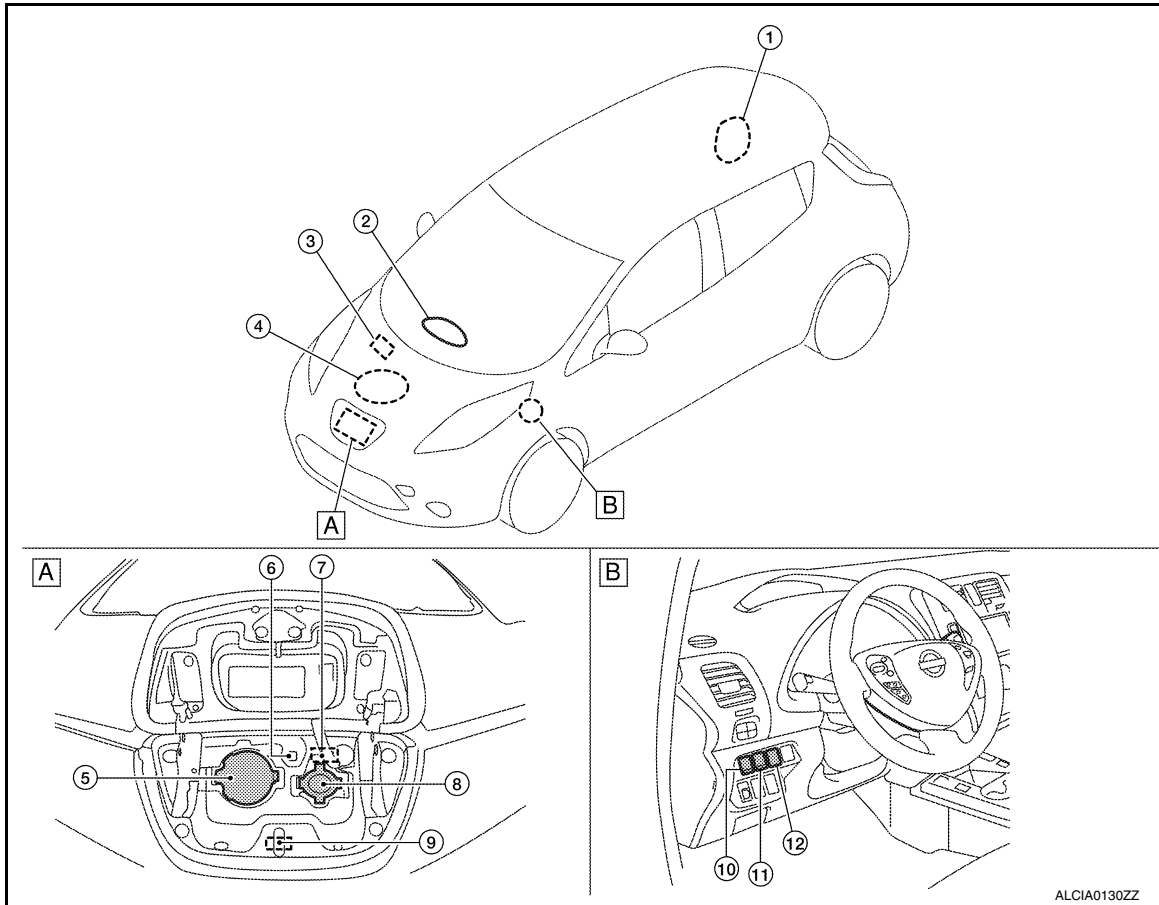
< SYSTEM DESCRIPTION >

## SYSTEM DESCRIPTION

### COMPONENT PARTS

#### Component Parts Location

INFOID:000000009120900



[A] Charge port (Vehicle front side)

[B] Instrument lower panel LH

No.	Component	Function
①	EVSE	<a href="#">VC-12, "EVSE"</a>
②	Charging status indicator	<a href="#">VC-15, "Charging Status Indicator"</a>
③	VCM	VCM is performed integrated control for vehicle charging system. Refer to <a href="#">EVC-16, "Component Parts Location"</a> , for detailed installation location.
④	PDM (Power delivery module)	<a href="#">VC-12, "PDM (Power Delivery Module)"</a>
⑤	Quick charge port*	<a href="#">VC-13, "Charge Port"</a>
⑥	Charge port light	<a href="#">VC-14, "Charge Port Light"</a>
⑦	Charge connector lock actuator	<a href="#">VC-14, "Charge Connector Lock Actuator"</a>
⑧	Normal charge port	<a href="#">VC-13, "Charge Port"</a>
⑨	Charge port lid opener actuator	Unlock the charge port lid according to operation signal from VCM. Refer to <a href="#">DLK-15, "Component Parts Location"</a> , for detailed installation location.
⑩	Immediate charging switch	<a href="#">VC-14, "Immediate Charging Switch"</a>

# COMPONENT PARTS

## < SYSTEM DESCRIPTION >

No.	Component	Function
⑪	Charge connector lock switch	<a href="#">VC-14, "Charge Connector Lock Switch"</a>
⑫	Charge port lid opener switch	Input charge port lid opener switch signal to VCM. Refer to <a href="#">DLK-15, "Component Parts Location"</a> , for detailed installation location.

\*: Model with quick charge port.

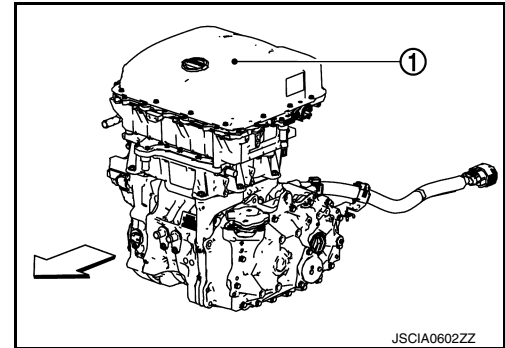
## PDM (Power Delivery Module)

INFOID:000000009120901

The PDM (Power Delivery Module)① is installed to the upper part of drive motor in the motor room together with drive motor inverter and consists of a charger and DC/DC converter.

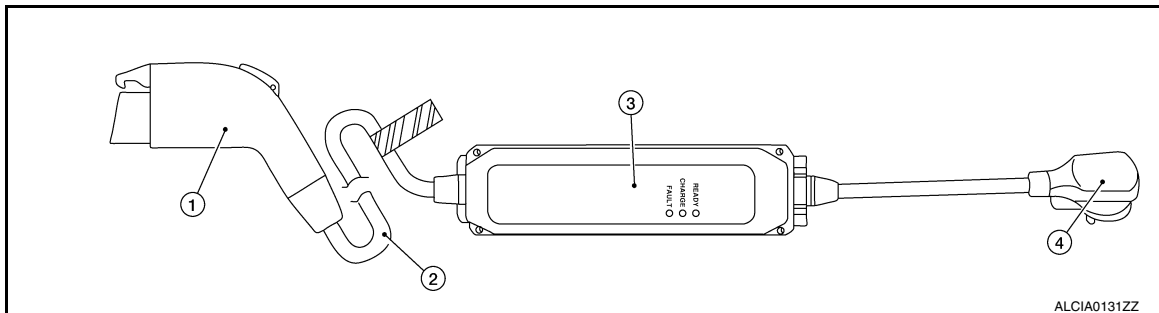
The charger converts external AC power source to DC power source (260 – 410 V), and charges the Li-ion battery according to the type of charging. The DC/DC converter charges the auxiliary 12V battery according to the VCM command.

← : Vehicle front



## EVSE

INFOID:000000009120902

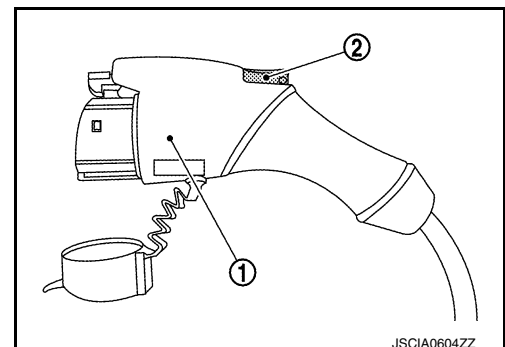


- ① Normal charge connector
- ② Cable
- ③ Control box
- ④ Plug

The EVSE (Electric Vehicle Supply Equipment) is manufactured based on the specifications prescribed in SAE-J1772, and is for charging by connecting a commercial power source to the vehicle. The EVSE consists of a plug, cable, control box, and a normal charge connector and supplies power to the vehicle using commercial power. By conducting PWM communication with the PDM (Power Delivery Module), the EVSE performs safe and suitable charging for the vehicle.

### Normal Charge Connector

The normal charge connector① is equipped with a release switch② to maintain the connection between the normal charge port and the charge connector.



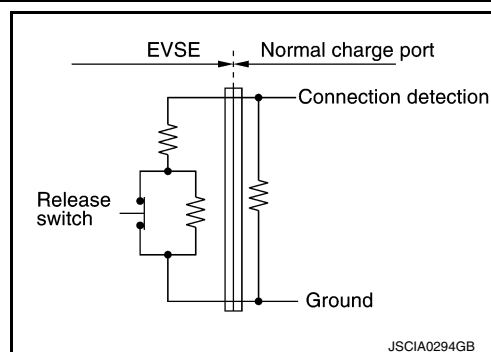
## COMPONENT PARTS

### < SYSTEM DESCRIPTION >

The charging connector is equipped with a release switch to maintain the connection between the normal charging port and the charging connector. In addition, a circuit for detecting the hold status is incorporated into the release switch, which stops the charging temporarily if the release switch is pressed during charging.

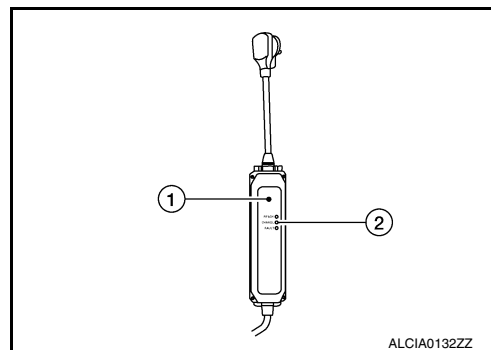
#### NOTE:

- When the release switch is pressed, the contacts turn OFF.
- The release switch cannot be pressed while the charge connector is locked.



### Control Box

The control box① is equipped with an indicator② that can be used to check the charging status and malfunction detection status. The indicator operates in the following cases when a commercial power supply is connected to the EVSE.



### <List of Operations>

Vehicle condition	Illumination status		
	READY	CHARGE	FAULT
When there is no AC power supply input	OFF	OFF	OFF
When AC power source is connected	ON (Approx.0.5 s)	ON (Approx.0.5 s)	ON (Approx.0.5 s)
When there is AC power supply input and the EVSE can communicate with the vehicle charger (when not charging)	ON	OFF	OFF
Charging	ON	ON	OFF
When the EVSE is not operating	OFF	OFF	OFF
When the EVSE detects electric leakage	ON	OFF	Blink
When the EVSE detects a malfunction in itself	ON	OFF	ON
When ground is not connected	Blink	OFF	OFF

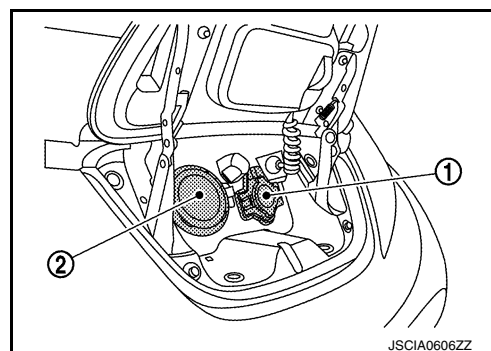
### Charge Port

INFOID:000000009120903

The charge port is installed at the front of the vehicle and is equipped with a normal charge port① and a quick charge port② (with quick charge port models). For charging, connect the EVSE or quick charge connector to the charge port according to the type of charging, and then start charging.

#### NOTE:

The figure shows a model with quick charge port.



## COMPONENT PARTS

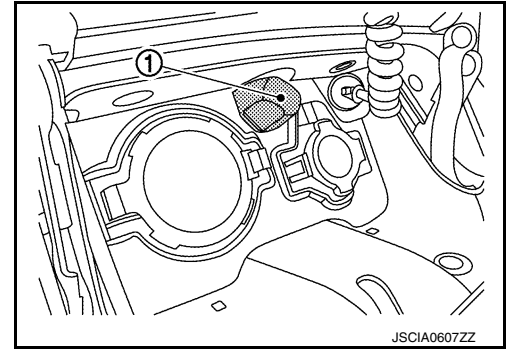
### < SYSTEM DESCRIPTION >

#### Charge Port Light

INFOID:000000009120905

The charge port light① is installed to the inside of the charge port lid. It turns ON when the charge port is unlocked for improving workability during charging.

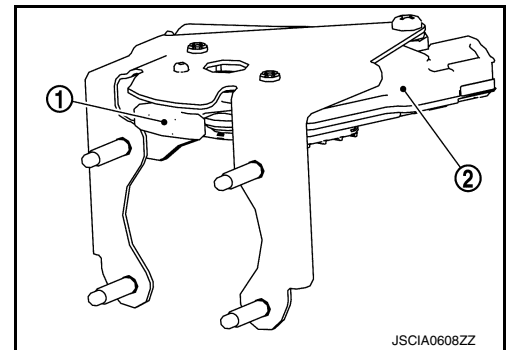
**Charge port light : LED**



#### Charge Connector Lock Actuator

INFOID:000000009120906

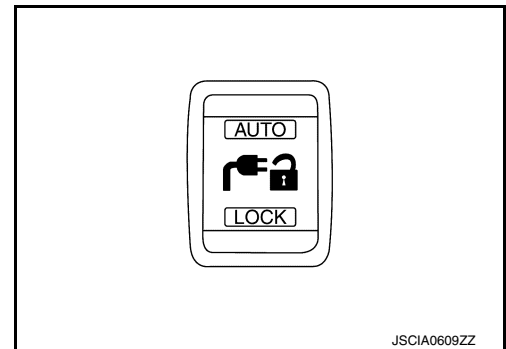
The charge connector lock actuator is installed to the normal charge port upper portion, and is composed of the swing arm① that locks the charge connector and the actuator② that operates the swing arm. The actuator operates according to the operation signal from VCM.



#### Charge Connector Lock Switch

INFOID:000000009120907

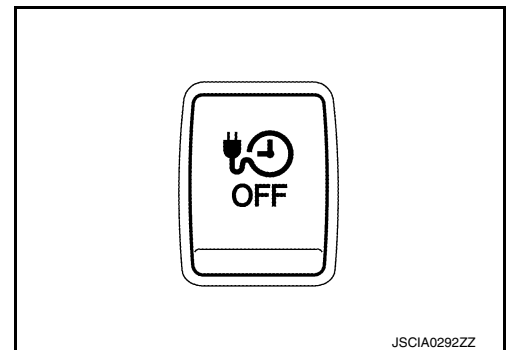
The charge connector lock switch is installed on the left instrument lower panel. It allows the charge connector lock mode to be selected according to the charging type.



#### Immediate Charging Switch

INFOID:000000008746423

The immediate charging switch is a switch that can be used to start charging immediately when timer charging is set.



# COMPONENT PARTS

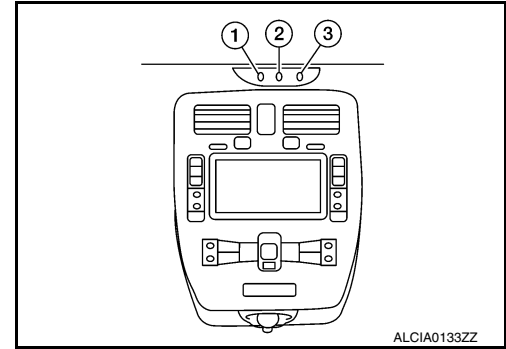
## < SYSTEM DESCRIPTION >

### Charging Status Indicator

INFOID:000000009120904

Charging status indicator is mounted at the upper part of the instrument panel. It indicates the charge status of the Li-ion battery.

- ① Charging status indicator 3
- ② Charging status indicator 2
- ③ Charging status indicator 1



Charging status indicator illuminates and blinks as per the following:

#### Indicator illuminating pattern

Vehicle condition	Indicator lamp	Illuminating (blinking) time	Condition
Full charge	<div>1</div> <div>2</div> <div>3</div>		ON for 5 minutes.
During charge	<div>1</div> <div>2</div> <div>3</div> <p>A: </p> <p>B: </p> <p>C: </p>		Li-ion battery available charge gauge (segments) A: 0-3 B: 4-8 C: 9-12
Timer charge ON	<div>1</div> <div>2</div> <div>3</div> <p>A: </p> <p>B: </p> <p>C: </p>		ON - OFF repeats for 15 minutes.
Immediate charge ON	<div>1</div> <div>2</div> <div>3</div>		ON for 15 minutes.
During following conditions -Automatic 12V battery charging -Timer/remote A/C operates -Li-ion battery heater operates*	<div>1</div> <div>2</div> <div>3</div>		Blinks during operation.
Charge connector lock is unlocked	<div>1</div> <div>2</div> <div>3</div>		Blinks 3 times after unlocking.
Normal charge connector is connected incorrectly.	<div>1</div> <div>2</div> <div>3</div>		Blinks for 30 seconds.

: Not illuminate : Illuminating : Blinking

\*: Models with Li-ion battery heater

JSCIA0610GB

## COMPONENT PARTS

### < SYSTEM DESCRIPTION >

#### High Voltage Warning Label

INFOID:000000009120908

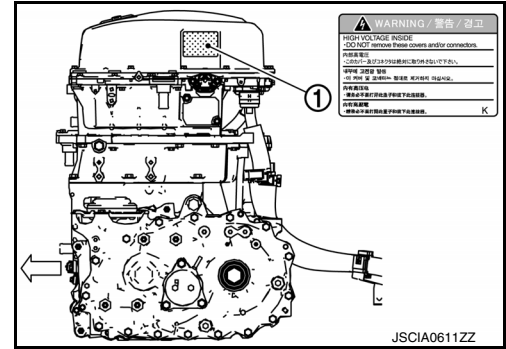
The high voltage warning labels① are affixed to the up side of PDM (Power Delivery Module).



: Vehicle front

#### **CAUTION:**

After replacing PDM (Power Delivery Module), check that the labels are affixed in the original position.





# SYSTEM

< SYSTEM DESCRIPTION >

## SYSTEM

### VEHICLE CHARGING SYSTEM

#### VEHICLE CHARGING SYSTEM : System Description

INFOID:000000009120917

#### DESCRIPTION

This section describes the controls related to the vehicle charging system.

Item	Description	Refer to
Li-ion battery charge control	Automatically selects a charge mode that is suitable for the external power source and controls Li-ion battery charging.	<a href="#">VC-17</a>
Charge port control	Comprehensive control for improving the efficiency of charging work performed by the VCM.	<a href="#">VC-19</a>
Power voltage variable control system	Changes the DC/DC converter output inside the PDM (Power Delivery Module) according to the VCM commands.	<a href="#">VC-22</a>
Automatic 12V battery charge control	Controls the DC/DC converter inside the PDM (Power Delivery Module) according to the VCM commands, and charges the 12V battery.	<a href="#">VC-22</a>

#### PDM (POWER DELIVERY MODULE)

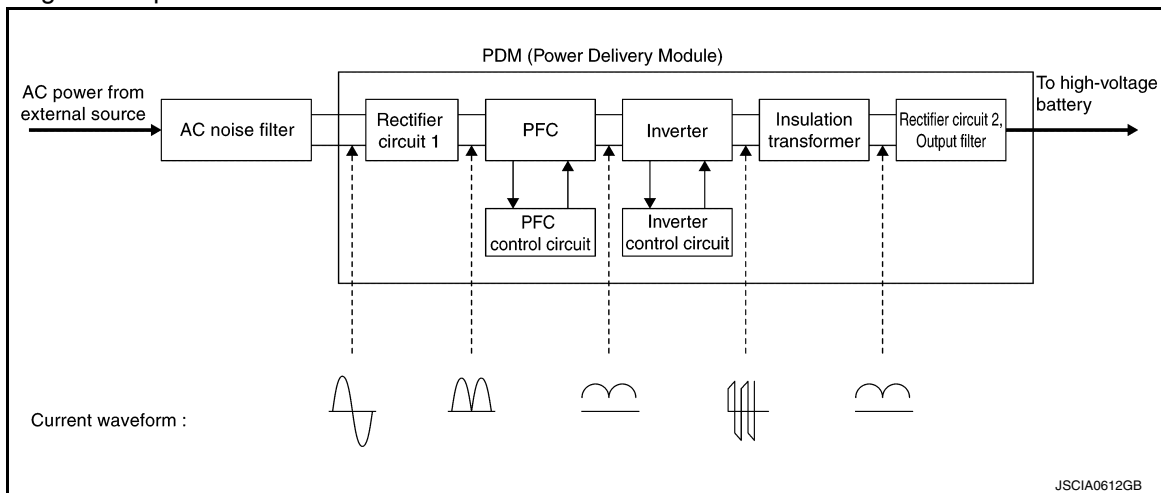
##### Description

The charger uses a 2-converter system which consists of the PFC circuit and the DC/DC converter. It improves charging efficiency, charge level accuracy, and the service life of the Li-ion battery. PDM (Power Delivery Module) judges whether external power supply is 100 V or 200 V, and automatically switches to charging that is appropriate for the power supply.

##### NOTE:

PFC (Power Factor Correction) circuit is a power factor improvement circuit. It is a device that efficiently converts AC power supply input from an external power source to a DC power supply.

##### Basic Charger Principle



1. AC power supply which is externally input is rectified to DC power with rectifier circuit 1.
2. The power factor of the rectified DC power supply is improved by the PFC circuit, and is boosted at the same time.
3. The boosted DC power supply is converted again to AC power supply by the inverter.
4. The voltage of the AC power supply from the inverter is converted by the insulated transformer, and is rectified to high-voltage DC power by rectifier circuit 2.
5. The rectified high-voltage DC power is output by the output circuit.

#### LI-ION BATTERY CHARGE CONTROL

#### LI-ION BATTERY CHARGE CONTROL : System Description

INFOID:000000009120919

#### OVERVIEW OF CHARGING FUNCTIONS

# SYSTEM

## < SYSTEM DESCRIPTION >

There are two types of Li-ion battery charging. Normal charging converts a commercial power supply to DC power, and quick charging uses a special charger.  
For information about the charging sound system, refer to [EVC-53, "LI-ION BATTERY CHARGE CONTROL : System Description"](#).

## CHARGE MODE

Charge mode		Remaining charge level	Time required for charge (25°C)
Normal charge mode	Quick charge	80% or 100%* <sup>1</sup> (selectable)	AC 200 V: Approx. 8 hours AC 100 V: Approx. 28 hours (When charged from the point where the battery level warning lamp turns ON to 100%.)
	Timer charge		
	Remote charge		
Quick charge mode		80% or 100%* <sup>1</sup> (selectable) <b>NOTE:</b> When the specified time is passed, charging stops even if the charge level is not full.* <sup>2</sup>	Approx. 30 minutes (When charged from the point where the battery level warning lamp turns ON to 80%.) <b>NOTE:</b> When the battery temperature is low or high, approx. 60 – 90 min or more may be required.

\*1: Depending on the battery state, 100% may not be reached.

\*2: After charging stops, additional charging by quick charge is possible.

## NORMAL CHARGE MODE

In this mode, the EVSE is connected for charging. Normal charging includes quick charge mode, timer charge mode, and remote charge mode. In all modes, the charge level can be set to either 80% or 100%.

### NOTE:

The method of setting the charge level varies according to the vehicle specifications.

×: Setting available

Setting operation	Charge level setting			Refer to
	Quick charge	Timer charge	Remote charge	
Navigation system (Models with navigation system)	×	×	×	<ul style="list-style-type: none"> <li>• <a href="#">AV-102</a> (Without BOSE system)</li> <li>• <a href="#">AV-232</a> (With BOSE system)</li> </ul>
Combination meter (Models without navigation system)	×	×	—	<a href="#">MWI-35</a>

### Quick Charge Mode

This mode immediately starts charging when the EVSE is connected. When timer charge is not set, the system enters quick charge mode when the EVSE is connected. When timer charge is set, quick charge mode can be selected by pressing the quick charge switch.

### Timer Charge Mode

This mode starts and stops charging according to the timer that is set on VCM.

### NOTE:

The timer setting method varies according to vehicle specifications.

- Models with navigation without BOSE system: Refer to [AV-102, "MULTI AV SYSTEM : System Description"](#).
- Models with navigation and BOSE system: Refer to [AV-232, "MULTI AV SYSTEM : System Description"](#).
- Models without navigation system: Refer to [MWI-35, "INFORMATION DISPLAY : System Description"](#).

### Remote Charge Mode

This mode starts charging by remote control with a mobile device.

### NOTE:

For information about operation, refer to [AV-404, "TELEMATICS SYSTEM : System Description"](#).

## QUICK CHARGE MODE

Mode that performs charging with quick charger. Maximum charge level varies according to the remaining level of the Li-ion battery at the start of charging. Even if charging is not completed, when the charge time set

# SYSTEM

## < SYSTEM DESCRIPTION >

on the quick charger or the time-out (approximately 30 - 60 minutes) set on the vehicle passes, charging stops.

### NOTE:

- When the battery temperature is ambient temperature, charging stops after approximately 30 minutes.
- When the battery temperature is low or high, charging stops after a maximum of 60 minutes.
- If charging stops before charging is complete, additional charging by quick charge can be performed again.

## CHARGING STATUS INDICATOR AND CHARGING SOUND SYSTEM

The charge connector connection status and charge receiving status can be checked with the charging status indicator and the electronic sound from the Vehicle Sound for Pedestrians (VSP).

- For charging status indicator, refer to [VC-15, "Charging Status Indicator"](#).
- For charging sound system, refer to [VSP-19, "CHARGE SOUND SYSTEM : System Description"](#).

## CHARGE PORT CONTROL

### CHARGE PORT CONTROL : System Description

INFOID:000000009120920

### DESCRIPTION

The full range of charge port control is performed by the VCM. This includes charge connector lock/unlock control which automatically locks the charge connector during normal charging and at other times, and charge port light control which automatically turns ON the LED illumination inside the port to improve charge port visibility when the charge connector is inserted or removed.

Control	Description
Charge connector lock/unlock control	Automatically locks and unlocks the charge connector when the normal charge connector is connected and during normal charging.
Charge port light control	Automatically turns the LED lighting inside the charge port ON/OFF.
Charge port lid open control	Performs unlocking of the charge port lid.
Answer-back control	Checks operation of charge connector lock/unlock control.

### CHARGE CONNECTOR LOCK/UNLOCK CONTROL

#### Function Description

Charge connector lock/unlock control automatically locks the charge connector according to the charging type to prevent tampering during charging.

The VCM detects the status of the charge connector lock switch and charge port, and controls the charge connector lock actuator according to the mode and vehicle conditions. For details of control, refer to [EVC-63, "CHARGE PORT CONTROL : System Description"](#).

#### Lock Mode

Three lock modes can be selected according to the charging type. The mode can be changed by operating the charge connector lock switch that is located on the switch panel on the left side of the driver's seat. The selected mode can also be checked on the vehicle information display.

Lock mode (Switch position)	Basic operation	
	Lock	Unlock
LOCK mode	Normal charge connector is always locked when connected.	Unlock operation
AUTO mode	Locked only during the period of time from start to end of normal charging.*	<ul style="list-style-type: none"><li>• When normal charging is completed</li><li>• Unlock operation</li></ul>
UNLOCK mode (Neutral position)	Does not lock.	—

\*: Also locks when only timer A/C, remote A/C, or de-ice control is operating.

#### Unlock

When the following operations are performed, the charge connector lock is temporarily released.

- Operation of the charge port lid opener button on the Intelligent Key
- Pressing of the charge port lid opener switch

### CAUTION:

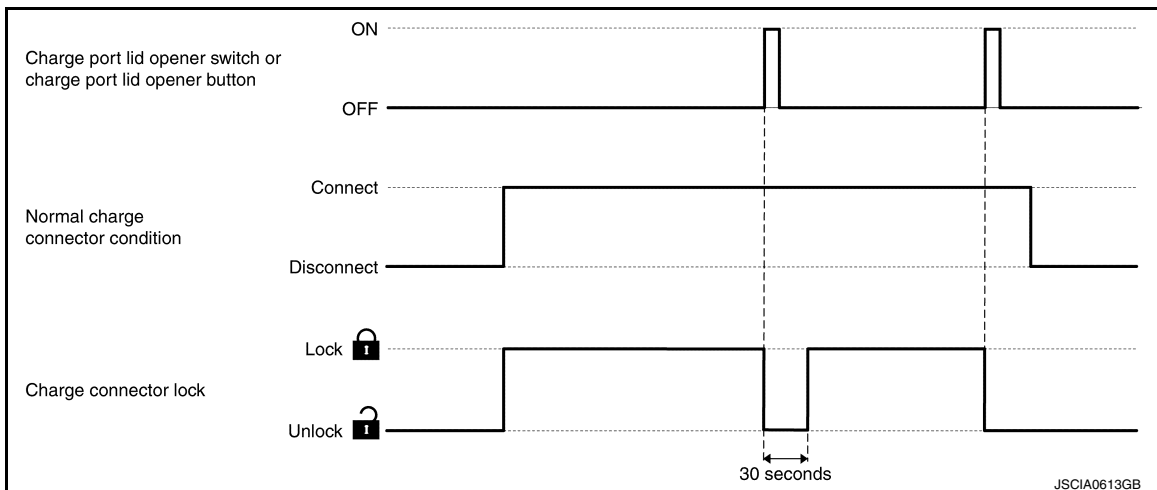
If the charge connector is not disconnected, it is locked again automatically after 30 seconds.

# SYSTEM

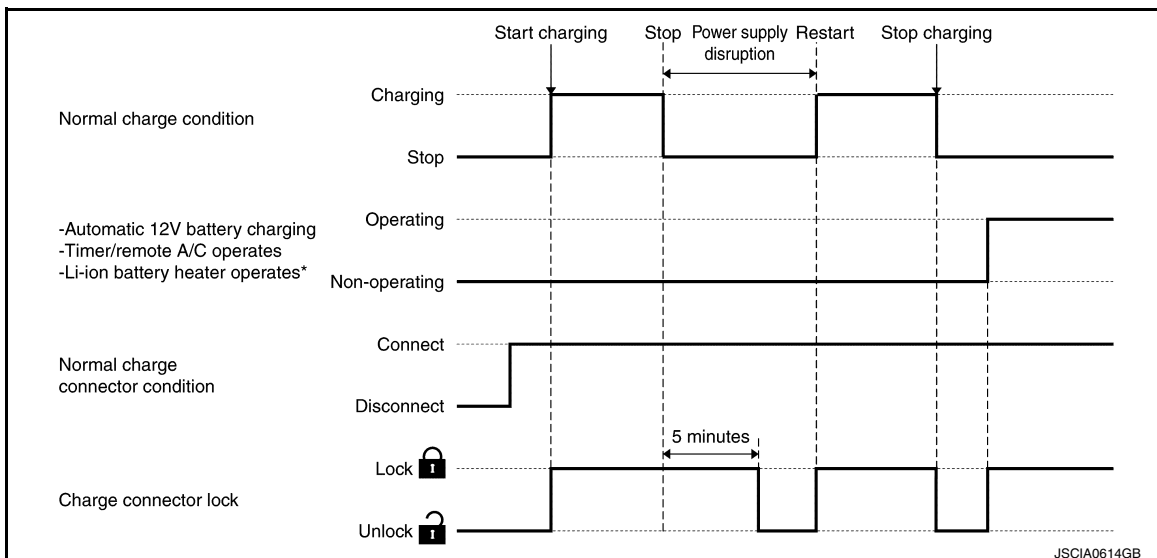
## < SYSTEM DESCRIPTION >

### Operation Timing Chart

#### • LOCK mode



#### • AUTO mode



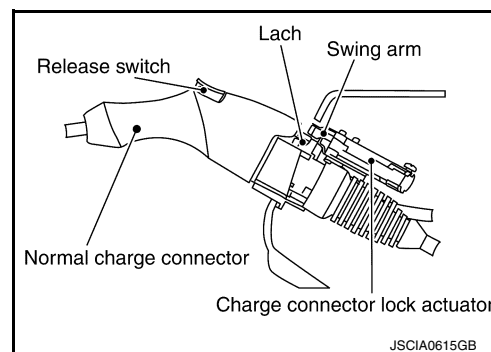
\*:Models with Li-ion battery heater

### Operation Description

The swing arm of the charge port lock actuator fits into the latch upper portion on the normal charge connector. This limits the movement of the latch and locks the charge connector.

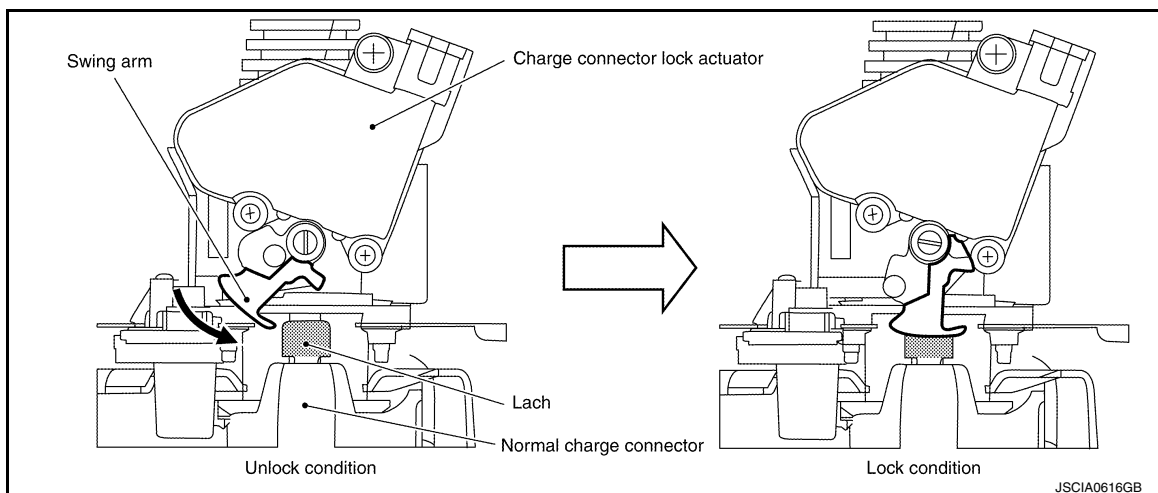
#### **CAUTION:**

The release switch cannot be pressed while the connector is locked.



# SYSTEM

## < SYSTEM DESCRIPTION >



### CAUTION:

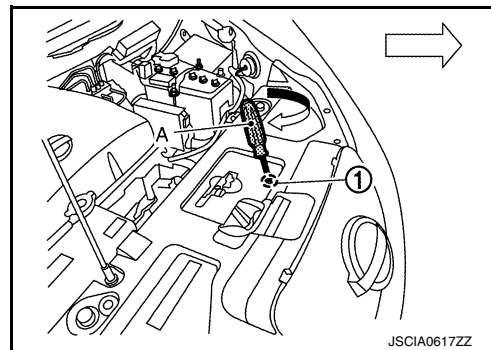
If the charge connector lock cannot be released, use a flat-bladed screwdriver or a similar tool to release it manually.

#### Countermeasure In Case Of Charge Connector Lock/Unlock Control Malfunction

If the charge connector lock does not release automatically, perform the following procedure to release the lock manually.

1. Open hood.
2. Insert a flat-bladed screwdriver or similar tool (A) into the radiator grille upper hole①, and turn the screw portion of the charge connector lock actuator clockwise approximately 45° to release the charge connector lock.

↩ : Vehicle front



## CHARGE PORT LIGHT CONTROL

### Function Description

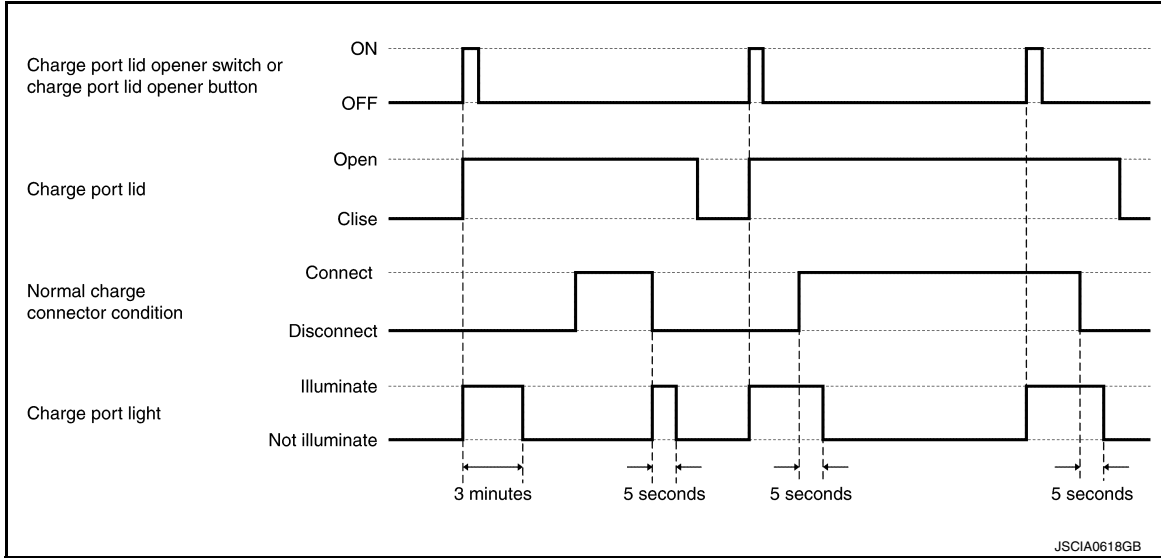
Charge port light control automatically turns the LED illumination installed to inside of charge port lid ON and OFF to improve workability during charging.

The VCM performs control for turning the charge port light ON/OFF according to the signal from the charge port lid opener switch or the Intelligent Key charge port lid opener button, and according to the vehicle conditions. For details of control, refer to [EVC-63. "CHARGE PORT CONTROL : System Description"](#).

# SYSTEM

## < SYSTEM DESCRIPTION >

### Operation Timing Chart



### CHARGE PORT LID OPEN CONTROL

#### Function Description

An electromagnetic charge port lid opener is adopted and unlocks the charge port lid (depending on the vehicle conditions) using the charge port lid opener switch installed to the right instrument lower panel or the charge port lid opener button on the Intelligent Key.

The VCM controls the charge port lid actuator according to the signal from the charge port lid opener switch or the Intelligent Key charge port lid opener button. For control, refer to [EVC-63, "CHARGE PORT CONTROL : System Description"](#).

#### NOTE:

If the lock cannot be released due to a fully discharged battery, malfunction of the charge port lid opener actuator, or other reason, release the lock manually. Refer to [DLK-225, "Removal and Installation"](#).

### ANSWER-BACK CONTROL

#### Function Description

Answer-back control allows the unlock status of charge connector lock/unlock control to be checked using the charging status indicator and the electronic sound from the Vehicle Sound for Pedestrians (VSP).

Condition	Charging status indicator	Vehicle Sound for Pedestrians (VSP)
Press the charge port lid opener switch or Intelligent Key charge port lid opener button.	Three blinks (All lamps)	Short beep (Electronic sound sounds three times.)

- For charging status indicator, refer to [VC-15, "Charging Status Indicator"](#).
- For Vehicle Sound for Pedestrians, refer to [VSP-19, "CHARGE SOUND SYSTEM : System Description"](#).

### POWER VOLTAGE VARIABLE CONTROL SYSTEM

### POWER VOLTAGE VARIABLE CONTROL SYSTEM : System Description INFOID:000000009120921

#### DESCRIPTION

Power voltage variable control reduces the electric power consumption from the Li-ion battery by varying the DC/DC converter output in a range from 13 V to 15 V according to the use status of electric equipment and the 12V battery status.

For control, refer to [EVC-60, "POWER VOLTAGE VARIABLE CONTROL SYSTEM : System Description"](#).

### AUTOMATIC 12V BATTERY CHARGE CONTROL

### AUTOMATIC 12V BATTERY CHARGE CONTROL : System Description INFOID:000000009120922

#### DESCRIPTION

< SYSTEM DESCRIPTION >

The 12V battery automatic charge control reduces the frequency with which the 12V battery becomes fully discharged by automatically charging the 12V battery if the 12V battery voltage is low when the power switch is turned to ON due to vehicle being left to sit for a long time.

The PDM (Power Delivery Module) controls the internal DC/DC converter by using commands from the VCM, and charges the 12V battery using power from the Li-ion battery.

For control, refer to [EVC-61, "AUTOMATIC 12V BATTERY CHARGE CONTROL : System Description"](#).

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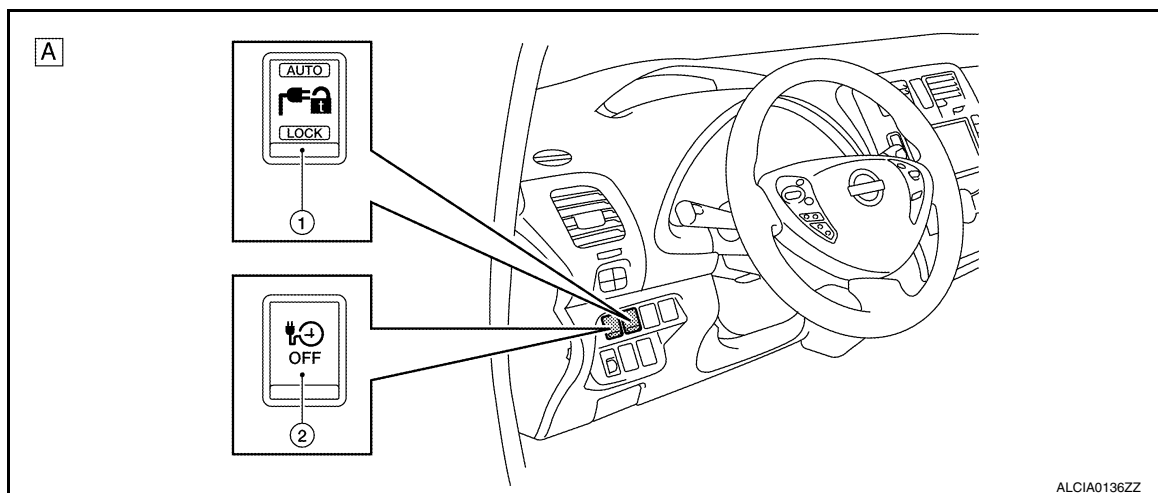
# OPERATION

< SYSTEM DESCRIPTION >

## OPERATION

### Switch Name and Function

INFOID:000000009342936



**A** Instrument panel area LH

No.	Switch name	Operation	Function
①	Charge connector lock switch	AUTO	Lock operation is performed only during normal charging.
		MIDDLE	<ul style="list-style-type: none"> <li>The charge connector lock does not operate.</li> <li>The connector lock is released if the switch is moved to the middle position while the charge connector lock is operating.</li> </ul>
		LOCK	The lock operation is performed at all times when the normal charge connector is connected.
②	Immediate charging switch	Pressed	When timer charge is set, quick charge mode is engaged and normal charging is started.

#### NOTE:

- For normal charge control, refer to [VC-17, "LI-ION BATTERY CHARGE CONTROL : System Description"](#)
- For normal charge connector lock/unlock control, refer to [VC-19, "CHARGE PORT CONTROL : System Description"](#).



# HANDLING PRECAUTION

< SYSTEM DESCRIPTION >

## HANDLING PRECAUTION

### Vehicle Charging System

INFOID:000000008746431



#### HANDLING OF CHARGE CABLE, CHARGE PORT, AND CHARGE CONNECTOR

- Never touch metal terminals of the charge port or the charge connector.
- Never modify or disassemble control box, socket, charge cable, charge connector, or charge port.
- Never apply excessive force to the charge cable.
  - Never pull.
  - Never twist.
  - Never drag.
- Never place a heavy item on charge cable.
- Never place near a heating device (heater, etc.).
- Never drop or subject to strong impact.
- When storing, be sure to attach the cap to the connector before storing.
- When storing, store in a location away from direct sunlight, not exposed to rain or wind, and where dust and dirt do not enter.
- Use only with a designated socket especially wired for EV/PHEV with NISSAN recommended work or equivalent means. (This is because there is an extremely high risk of electric shock if the ground line is connected incorrectly.)
- Never allow the control box to be submerged in water.
- Maximum service temperature: 45 °C (113 °F)


#### PRECAUTIONS FOR CHARGING

- Use genuine NISSAN EVSE only.
- Never use an extension cord or conversion adapter.
- Never touch the plug with wet hands.
- If the plug is dirty or wet, wipe it with a clean, dry cloth.
- Check that there is no foreign material such as water or dust in the charge port or the charge connector.

#### **WARNING:**

-  Since there may be a risk of electric shock, never touch the charge gun or charge port if they contain foreign material.
-  Since there may be a risk of electric shock or electric leakage, never connect the charge gun or charge port if they contain foreign material.
- Never use the EVSE cord or cable if it is worn, or if there are any deep scratches or other damage where the core wires are visible.
- Never use the EVSE charge connector, control box, or plug if it is broken, scratched, cracked, or otherwise damaged.
- Check that there is no rust, corrosion, or damage on the charge port or charge gun. Check that there is no loosening at the time of connection.

#### **WARNING:**

-  Since electric leakage, electric shock, short-circuit, or fire may occur, never charge if any malfunction is found.
- Never perform charging when the connection is heavily exposed to water.
- Never perform charging with the body cover attached.
- Never perform charging when there may be a risk of lightning.
- Stop charging immediately when an unusual odor or smoke is found during charging.
- Never place hand near the cooling fan during charging.

#### **NOTE:**

- The cooling fan may automatically start operation during charging when the power switch is turned OFF.
- After charging, securely close the cover and lid of the charge port to prevent entry of water or dust.
- To turn on READY after charging, operate after disconnecting the charge connector from the charge port.

#### **NOTE:**

- When the charge connector is connected to the charge port, READY is disabled.
- To prevent electric shock or fire arising from electric leakage, use a waterproof plug with grounding connected to the ground fault interrupter.
- Never connect to a socket providing other than the rated voltage.

## HANDLING PRECAUTION

### < SYSTEM DESCRIPTION >

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- For charging with AC 100 V, use 15 A rating or more plug. For charging with AC 200 V, use 20 A rating or more plug.

#### **WARNING:**

**If a plug with a low current rating is used or if a plug adapter is installed and used in combination with another device, the plug may cause abnormal heating, resulting in a fire.**

- For charging, never use a generator or any other power source other than specified.

#### **NOTE:**

Charging may not be performed correctly or a malfunction may occur.

- When quick charging is performed, be sure to use a quick charger compatible with the vehicle.

# ON BOARD DIAGNOSTIC (OBD) SYSTEM

< SYSTEM DESCRIPTION >

## ON BOARD DIAGNOSTIC (OBD) SYSTEM

### Diagnosis Description

INFOID:0000000008746432

This system is an on board diagnostic system that detects a malfunction automatically. A malfunction is stored in PDM (Power Delivery Module) memory as a DTC. The diagnostic information can be obtained with CONSULT.

### Counter System

INFOID:0000000008746433

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".

### DTC and Freeze Frame Data

INFOID:0000000008746434

The PDM (Power Delivery Module) can save multiple DTC but can only save one freeze frame data. After the PDM (Power Delivery Module) has detected a malfunction and saves the DTC and freeze frame data, if a different malfunction is detected, multiple DTC are confirmed, but only the freeze frame data that is saved first can be confirmed.

The DTC and freeze frame data can be deleted when the self-diagnostic is deleted.

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# DIAGNOSIS SYSTEM [PDM(POWER DELIVERY MODULE)]

< SYSTEM DESCRIPTION >

## DIAGNOSIS SYSTEM [PDM(POWER DELIVERY MODULE)]

### CONSULT Function

INFOID:000000009120930

#### FUNCTION

Diagnostic test mode	Function
Work Support	This mode enables a technician to adjust some devices faster and more accurately by following the indications on the CONSULT.
Self-diagnostic result	Self-diagnostic results and freeze frame data can be read and erased quickly.*
Data monitor	Input/Output data in the PDM (Power Delivery Module) can be read.
Active Test	Operable under the condition that the actuator is activated by CONSULT via the PDM (Power Delivery Module) or within the range that a (some of) command value is designated.
ECU Identification	PDM (Power Delivery Module) part number can be read.

\*: The following diagnosis information is cleared when the PDM (power delivery module) memory is erased.

- Diagnostic trouble codes
- Freeze frame data

#### WORK SUPPORT MODE

Work item	Description
Charging current limit history	Displays the previous 10 charging current readings during normal charging, allowing the history of current limits and charging stops resulting from EVSE commands to be checked.

#### NOTE:

If the minimum value is 7.2 A or less, the current limit display reads "Yes", indicating that the current is limited or charging is stopped during charging. A possible cause is insufficient contact due to damage or wear of the EVSE plug or socket.

Change the combination of socket and EVSE that are used and perform normal charging. The malfunctioning component can be identified by checking "CHARGE CURRENT LIMITATION HISTORY" again.

#### SELF-DIAG RESULTS MODE

##### Self Diagnostic Item

- Regarding items of DTC, refer to [VC-34, "DTC Index"](#).
- Regarding items of DTC sub type, refer to [VC-35, "DTC Sub Type Index"](#).

##### IGN Counter

IGN counter is displayed in Freeze Frame Data (FFD). It displays the number of operations of power switch from OFF to ON after DTC recovery to normal.

- CAN malfunction (U1000)
  - The number is 0 when a malfunction is detected now.
  - 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.
  - The number is fixed to 39 until the self-diagnosis results are erased if it is over 39.
- Other than CAN malfunction (Other than U1000)
  - The number is 0 when a malfunction is detected now.
  - The displayed number counts up at each operation of power switch from OFF to ON after recovery to normal, such as 1 → 2 → 3...254 → 255.
  - The number is fixed to 255 until the self-diagnosis results are erased if it is over 255.

##### Freeze Frame Data

The Freeze Frame Data shows the status of the vehicle when the DTC is detected and is useful for recreating the status when the malfunction occurred.

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Freeze frame data item	Description
Q/CHG CONNECT DETECT	Displays the connection status of the quick charge connector.
Q/CHG START/STOP SIG 1	Displays the input status of the charge start/stop signal 1 from the quick charger.
Q/CHG START/STOP SIG 2	Displays the input status of the charge start/stop signal 2 from the quick charger.
QUICK CHARGE PERMIT	Displays the transmitting status of the charge start permission signal being sent to the quick charger.
Q/CHG RELAY +	Displays the control status of the quick charge relay (+).
Q/CHG RELAY -	Displays the control status of the quick charge relay (-).
PWM SIGNAL	Displays the reception status of the PWM signal being sent from the EVSE.
EVSE STATE JUDG	Displays the engagement detection status of the EVSE charge connector.
WELD DIAG VOL	Displays the presence or absence of voltage between the high voltage terminal of the quick charge port.
PD MODULE TEMP [°C]	Displays the PDM (Power Delivery Module) internal temperature.
EV SYS W/L REQ	Displays the status of EV system warning lamp signal transmission that is sent to the VCM.
F/S REQ	Displays the status of fail-safe request signal transmission that is sent to the VCM.
Q/CHG PORT TEMP	Displays the quick charge port temperature status.
PWM SIGNAL VOLTAGE [V]	Displays the voltage of a PWM signal transmitted from EVSE.
TIME	Displays the number of DTC detected trips.
ELAPSED TIME	Displays the time elapsed since the detection of the DTC.

## DATA MONITOR MODE

### NOTE:

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

Monitor item	Unit	Description
Q/CHG CONNECT DETECT	CNCT/DISC-NCT	Displays the connection status of the quick charge connector. • CNCT: The quick charge connector is connected. • DISCNCT: The quick charge connector is not connected.
Q/CHG START/STOP SIG 1	ON/OFF	Displays the input status of the charge start/stop signal 1 from the quick charger. • OFF: The quick charger start switch is OFF and not under quick charge. • ON: The quick charger start switch ON or under quick charge.
Q/CHG START/STOP SIG 2	ON/OFF	Displays the input status of the charge start/stop signal 2 from the quick charger. • OFF: Isolation check with a quick charger is NG or not completed. • ON: Isolation check with a quick charger completed normally.
QUICK CHARGE PERMIT	LOW/HIGH	Displays the transmission status of the charge start permission signal being sent to the quick charger. • LOW: Allow quick charge start • HIGH: Quick charge start is not allowed
Q/CHG RELAY +	On/Off	Displays the control status of the quick charge relay (+). • On: Quick charge relay (+) is ON. • Off: Quick charge relay (+) is OFF.
Q/CHG RELAY -	On/Off	Displays the control status of the quick charge relay (-). • On: Quick charge relay (-) is ON. • Off: Quick charge relay (-) is OFF.
PWM SIGNAL	OK/NONE	Displays the reception status of the PWM signal being sent from the EVSE. • COMM: Communicating normally. • NO COM: Not communicating

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Monitor item	Unit	Description
EVSE STATE JUDG	CNCT/ INPUT/ NONE/NO CNCT OR ER- ROR	Displays the engagement detection status of the normal charge connector. <ul style="list-style-type: none"> <li>• CNCT: There is no AC input in the charge connector connected status.</li> <li>• INPUT: There is AC input in the charge connector connected status.</li> <li>• NONE: The charge connector is not engaged or there is no PWM communication from the EVSE.</li> <li>• NO CNCT OR ERROR: The charge connector is not engaged and malfunction of EVSE, or during a power outage.</li> </ul>
WELD DIAG VOL	PRESENT/AB- SENT	Displays the presence or absence of voltage between the high voltage terminal of the quick charge port. <ul style="list-style-type: none"> <li>• PRESENT: Detects voltage Between the high voltage terminal of quick charge port.</li> <li>• ABSENT: Not detects voltage Between the high voltage terminal of quick charge port.</li> </ul>
PD MODULE TEMP [°C]	degC	Displays the PDM (Power Delivery Module) internal temperature.
EV SYS W/L REQ	On/Off	Displays the status of EV system warning lamp signal transmission that is sent to the VCM. <ul style="list-style-type: none"> <li>• On: Transmit the signal.</li> <li>• Off: Non-transmit the signal.</li> </ul>
F/S REQ	On/Off	Displays the status of fail-safe request signal transmission that is sent to the VCM. <ul style="list-style-type: none"> <li>• On: Transmit the signal.</li> <li>• Off: Non-transmit the signal.</li> </ul>
Q/CHG PORT TEMP	OK/NG	Displays the quick charge port temperature status. <ul style="list-style-type: none"> <li>• OK: Normal</li> <li>• NG: Temperature is high</li> </ul>
PWM SIGNAL VOLTAGE	V	Displays the voltage of a PWM signal transmitted from EVSE.

## ACTIVE TEST MODE

### CAUTION:

After performing active test, always erase all DTC.

Test item	Function/Condition	Judgment	Check item (Remedy)
Q/CHG RELAY +	<ul style="list-style-type: none"> <li>• Remove the service plug.</li> <li>• Power switch ON</li> <li>• Use active test to turn ON/OFF the quick charge relay.</li> </ul>	Check that the quick charge relay makes the operating sound.*	<ul style="list-style-type: none"> <li>• Harness and connector</li> <li>• Quick charge relay (+)</li> <li>• PDM (Power Delivery Module)</li> </ul>
Q/CHG RELAY –	<ul style="list-style-type: none"> <li>• Remove the service plug.</li> <li>• Power switch ON</li> <li>• Use active test to turn ON/OFF the quick charge relay.</li> </ul>	Check that the quick charge relay makes the operating sound.*	<ul style="list-style-type: none"> <li>• Harness and connector</li> <li>• Quick charge relay (–)</li> <li>• PDM (Power Delivery Module)</li> </ul>
QUICK CHARGE PERMIT	Quick charge permit signal is forcibly output.	Check continuity between PDM (Power Delivery Module) connector terminals to check that the transistor included in the PDM (Power Delivery Module) is ON.	PDM (Power Delivery Module)

\*: If operating noise is hard to hear, use a sound scope to check noise.

# PDM(POWER DELIVERY MODULE)

< ECU DIAGNOSIS INFORMATION >

## ECU DIAGNOSIS INFORMATION

### PDM(POWER DELIVERY MODULE)

#### Reference Value

INFOID:000000009290236

#### VALUES ON THE DIAGNOSIS TOOL

Specification data represents reference values.

#### NOTE:

- The displayed data may differ from an actual signal/value/operation, as some of them are calculated by PDM (Power Delivery Module), based on signals transmitted from PDM (Power Delivery Module)-related sensors to PDM (Power Delivery Module).
- Li-ion battery charge does not start when the power switch is ON. When it is required to charge with the power switch ON, start charging before turning ON the power switch.

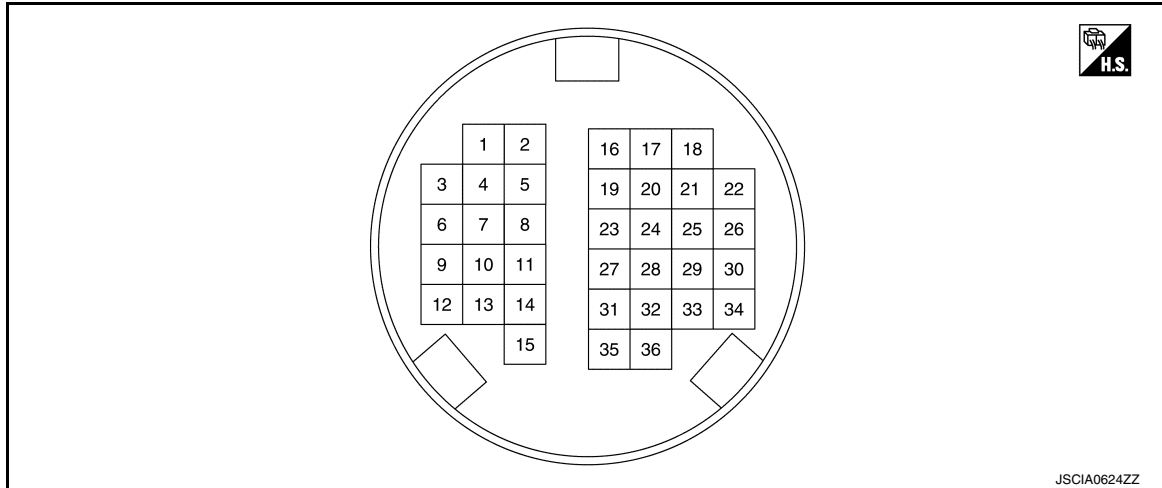
Monitor item	Condition		Values/status
Q/CHG CONNECT DETECT	POWER ON	Quick charging connector: Connected	CNCT
		Quick charging connector: Not connected	DISCNCT
Q/CHG START/STOP SIG 1	The quick charger start switch is OFF and not under quick charge.		OFF
	The quick charger start switch ON or under quick charge.		ON
Q/CHG START/STOP SIG 2	In the process of quick charge after the normal completion of insulation resistance check.		ON
	For a few seconds after turning ON the quick charger start switch.		OFF
QUICK CHARGE PERMIT	Quick charger start switch is OFF. Not in process of quick charge.		HIGH
	A lapse of a few seconds after turning ON the quick charger start switch.		HIGH→LOW
Q/CHG RELAY +	Quick charging in progress		On
	Not quick charging		Off
Q/CHG RELAY -	Quick charging in progress		On
	Not quick charging		Off
PWM SIGNAL	Normal charging in progress		COMM
	Except above		No COM
EVSE STATE JUDG	When the EVSE charge connector is connected		CNCT
	Normal charging in progress		INPUT
	When the EVSE change connector is not connected		NONE
	Except above		NO CNCT OR ERROR
WELD DIAG VOL	Quick charging in progress		PRESENT
	Except above		ABSENT
PD MODULE TEMP	Depending on the PDM (Power Delivery Module) temperature.		-40 – 215°C Indicates depending on the PDM (Power Delivery Module) temperature.
EV SYS W/L REQ	Power switch: ON	EV system warning lamp signal: Transmission	On
		EV system warning lamp signal: Non-transmission	Off
F/S REQ	Stop charging occurs during norma/quick charging		On
	Except above		Off

# PDM(POWER DELIVERY MODULE)

## < ECU DIAGNOSIS INFORMATION >

Monitor item	Condition	Values/status
Q/CHG PORT TEMP	When the quick charge port is abnormally hot	NG
	Except above	OK
PWM SIGNAL VOLTAGE	Normal charge	4 – 7 V

## TERMINAL LAYOUT



## PHYSICAL VALUES

### NOTE:

Specification data are reference values.

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	–	Signal name	Input/ Output		
6 (L)	—	Quick charger communication-L (CAN)	Input/ Output	—	—
7 (W)	—	Quick charger communication-H (CAN)	Input/ Output	—	—
9 (GR)	Ground	F/S CHG relay	Input	During quick charging	13 – 16 V
				Except above	0 V
10 (LG)	Ground	Plug in signal	Input	During charging	0 V
				Except above	11.5 – 15 V
11 (G)	—	EV system CAN-L	—	—	—
12 (O)	Ground	High voltage harness connector detecting circuit power supply	Input	Power switch: ON	13 – 15 V
15 (P)	Ground	High voltage harness connector detecting circuit signals	Output	Power switch: ON	13 – 15 V
16 (V)	Ground	Power ON power supply	Input	Power switch: ON	13 – 16 V
				Power switch: OFF	0 V
18 (R)	Ground	Battery power supply	Input	Power switch: ON	13 – 16 V
19 (R)	Ground	Quick charger permit signal	Input	During quick charging	10.8 – 13.2 V
				Except above	0 V
20 (BR)	Ground	Quick charger connection signal	Input	During quick charging	OPEN
				Except above	6.8 – 14.8 V



# PDM(POWER DELIVERY MODULE)

## < ECU DIAGNOSIS INFORMATION >

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
21 (G)	Ground	Quick charger start/stop signal 2	Input	During quick charging	10.8 – 13.2 V
				Except above	OPEN
22 (Y)	Ground	Quick charger start/stop signal 1	Input	During quick charging	10.8 – 13.2 V
				Except above	OPEN
25 (SB)	Ground	Quick charger port temperature sensor signal 2	Input	During quick charging	0.5 – 4.5 V
26 (V)	Ground	Quick charger port temperature sensor signal 1	Input	During quick charging	0.5 – 4.5 V
27 (L)	—	EV system CAN-H	—	—	—
29 (W)	—	EVSE connection signal	Output	During normal charging	0 – 5.0 V
				Except above	5.0 V
30 (BR)	Ground	EVSE communication (PWM)	Input/ Output	During normal charging	–12.6 – 12.6 V
				Except above	0 V

## Fail-Safe

INFOID:000000009290237

## FAIL-SAFE

When there is a malfunction with the PDM (Power Delivery Module), charging is stopped as a fail-safe.

## FAIL-SAFE LIST

×:Applicable —: Not applicable

DTC	Items (CONSULT screen terms)	Sub type (CONSULT screen terms)	Fail-safe
U1000	CAN COMM CIRCUIT	MISSING MESSAGE	×
		ERRATIC	×
		ELECTRICAL MALFUNCTION	×
U1008	QUICK CHARGER COMM	MISSING MESSAGE	×
		ERRATIC	×
U100A	CAN COMM ERROR	MISSING MESSAGE	×
U100B	QUICK CHARGER COMM	MISSING MESSAGE	×
		ERRATIC	×
U1010	CONTROL UNIT (CAN)	INTERNAL ELECTRICAL MALFUNCTION	×
		ELECTRICAL MALFUNCTION	×
B2801	Q/CHG ACTIVATION SIG ERROR	SIGNAL INVALID	×
		SIGNAL STUCK HIGH	×
B2802	Q/CHG ISOLATION SIGNAL ERROR	SIGNAL STUCK LOW	×
		SIGNAL STUCK HIGH	×
B2803	Q/CHG PERMIT SIGNAL ERROR	SIGNAL STUCK LOW	×
B2814	QUICK CHARGE RELAY	SIGNAL STUCK HIGH	×
B2820	QUICK CHARGER	—	—
B2830	QUICK CHARGE VOLTAGE SENSOR	CMPNENT INTERNAL MLFNCTN	—
B2840	PD MODULE	ELECTRICAL MALFUNCTION	×
		CMPNENT INTERNAL MLFNCTN	×
		COMPONENT/SYS OVER TEMP	×

# PDM(POWER DELIVERY MODULE)

## < ECU DIAGNOSIS INFORMATION >

DTC	Items (CONSULT screen terms)	Sub type (CONSULT screen terms)	Fail-safe
B2850	PD MODULE TEMP SENSOR	SIGNAL STUCK LOW	×
B2880	F/S CHG RELAY	SIGNAL STUCK LOW	×
		SIGNAL STUCK HIGH	×
B2890	DC/DC CONVERTER	ELECTRICAL MALFUNCTION	—
		CIRC VOLT BELOW THRESHOLD	—
		CMPNENT INTERNAL MLFNCTN	—
		COMPONENT/SYS OVER TEMP	—
		CIRC VOLT ABOVE THRESHOLD	—
B2900	PD MODULE	PROGRAM MEMORY ERROR	×
		DATA MEMORY ERROR	×
B2902	PD MODULE	MEMORY ERROR	—
		CMPNENT INTERNAL MLFNCTN	—
B2980	QUICK CHARGE PORT TEMP	SIGNAL STUCK HIGH	—
		COMPONENT/SYS OVER TEMP	×
B29A0	N/CHG PORT ENGAGEMENT ERROR	SIGNAL STUCK HIGH	×
		SIGNAL INVALID	×
B29C1	EVSE	NO SIGNAL	×
		SIGNAL STUCK LOW	×
		UNEXPECTED OPERATION	×
		SIGNAL STUCK HIGH	×
		SIGNAL INVALID	×

## DTC Index

INFOID:000000009290238

×:Applicable —: Not applicable

DTC	Items (CONSULT screen terms)	Sub type (CONSULT screen terms)	EV system warning lamp	Trip	Reference page
U1000	CAN COMM CIRCUIT	MISSING MESSAGE	×	1	<a href="#">VC-63</a>
		ERRATIC	×	1	
		ELECTRICAL MALFUNCTION	×	1	
U1008	QUICK CHARGER COMM	MISSING MESSAGE	×	1	<a href="#">VC-64</a>
		ERRATIC	×	1	
U100A	CAN COMM ERROR	MISSING MESSAGE	×	1	<a href="#">VC-67</a>
U100B	QUICK CHARGER COMM	MISSING MESSAGE	×	1	<a href="#">VC-64</a>
		ERRATIC	×	1	
U1010	CONTROL UNIT (CAN)	INTERNAL ELECTRIC MALFNCTN	×	1	<a href="#">VC-68</a>
		ELECTRICAL MALFUNCTION	×	1	
B2801	Q/CHG ACTIVATION SIG ERROR	SIGNAL INVALID	×	1	<a href="#">VC-69</a>
		SIGNAL STUCK HIGH	×	1	
B2802	Q/CHG ISOLATION SIGNAL ERROR	SIGNAL STUCK LOW	×	1	<a href="#">VC-73</a>
		SIGNAL STUCK HIGH	×	1	
B2803	Q/CHG PERMIT SIGNAL ERROR	SIGNAL STUCK LOW	—	1	<a href="#">VC-75</a>
B2814	QUICK CHARGE RELAY	SIGNAL STUCK HIGH	×	1	<a href="#">VC-78</a>
B2820	QUICK CHARGER	—	—	1	<a href="#">VC-80</a>
B2830	QUICK CHARGE VOLTAGE SENSOR	CMPNENT INTERNAL MLFNCTN	× or —	1	<a href="#">VC-81</a>

# PDM(POWER DELIVERY MODULE)

## < ECU DIAGNOSIS INFORMATION >

DTC	Items (CONSULT screen terms)	Sub type (CONSULT screen terms)	EV system warning lamp	Trip	Reference page
B2840	PDM (POWER DELIVERY MODULE)	ELECTRICAL MALFUNCTION	×	1	<a href="#">VC-83</a>
		CMPNENT INTERNAL MLFNCTN	×	1	
		COMPONENT/SYS OVER TEMP	×	1	
B2850	PD MODULE TEMP SEN	SIGNAL STUCK LOW	×	1	<a href="#">VC-87</a>
B2880	F/S CHARGE RELAY	SIGNAL STUCK LOW	×	1	<a href="#">VC-88</a>
		SIGNAL STUCK HIGH	×	1	
B2890	DC/DC CONVERTER	ELECTRICAL MALFUNCTION	—	1	<a href="#">VC-92</a>
		CIRC VOLT BELOW THRESHOLD	—	1	
		CMPNENT INTERNAL MLFNCTN	—	1	
		COMPONENT/SYS OVER TEMP	—	1	
		CIRC VOLT ABOVE THRESHOLD	—	1	
B2900	PDM (POWER DELIVERY MODULE)	PROGRAM MEMORY ERROR	×	1	<a href="#">VC-95</a>
		DATA MEMORY ERROR	×	1	
B2902	PDM (POWER DELIVERY MODULE)	MEMORY ERROR	×	1	<a href="#">VC-95</a>
		CMPNENT INTERNAL MLFNCTN	×	1	
B2980	QUICK CHARGE PORT TEMP	SIGNAL STUCK HIGH	×	1	<a href="#">VC-96</a>
		COMPONENT/SYS OVER TEMP	×	1	
B29A0	N/CHG PORT ENGAGEMENT ERROR	SIGNAL STUCK HIGH	×	1	<a href="#">VC-100</a>
		SIGNAL INVALID	—	1	
B29C1	EVSE	NO SIGNAL	×	1	<a href="#">VC-103</a>
		SIGNAL STUCK LOW	×	1	
		UNEXPECTED OPERATION	× or —	1	
		SIGNAL STUCK HIGH	×	1	
		SIGNAL INVALID	× or —	1	

## DTC Sub Type Index

INFOID:000000009290239

Items (CONSULT screen terms)	Description	Remarks
ELECTRICAL MALFUNCTION	Electrical Malfunction	—
SIGNAL STUCK LOW	Signal Stuck Low	—
SIGNAL STUCK HIGH	Signal Stuck High	—
SIGNAL INVALID	Signal Invalid	—
NO SIGNAL	No Signal	—
MEMORY ERROR	General Memory Error	—
DATA MEMORY ERROR	Data Memory Error	—
PROGRAM MEMORY ERROR	Program Memory Error	—
INTERNAL ELECTRIC MALFNCTN	Internal Electronic malfunction	—
INCRRCT COMPNT INSTALLED	Incorrect Component Installed	—
OVER TEMPERATURE	Over Temperature	—
ALIV/CNT INCRCT/NOT UPDAT	Alive / Sequence Counter Incorrect / Not Updated	This sub type is used by the control module to indicate that a signal was received without the corresponding rolling count value being properly updates.

## PDM(POWER DELIVERY MODULE)

### < ECU DIAGNOSIS INFORMATION >

Items (CONSULT screen terms)	Description	Remarks
SIG PRTCTN CLCLTN INCRCT	Value of Signal Protection Calculation Incorrect	This sub type is used by the control module to indicate, that a message was processed with an incorrect protection (checksum) calculation.
MISSING MESSAGE	Missing Message	This sub type is used for malfunctions where one (or more) expected message(s) is not received.
ERRATIC	Erratic	This sub type is used for malfunctions where the serial data, is momentarily implausible or discontinuous.
PARAMETRIC	Parametric malfunction	—
NO OPERATION	No Operation	—
UNEXPECTED OPERATION	Unexpected Operation	—
CMPNENT INTERNAL MLFNCTN	Component Internal malfunction	—
COMPONENT/SYS OVER TEMP	Component or System Over Temperature	—
CIRC VOLT BELOW THRESHOLD	Voltage reduction	—
CIRC VOLT ABOVE THRESHOLD	Overvoltage	—
CIRC CURR ABOVE THRESHOLD	Overcurrent	—

# VEHICLE CHARGING SYSTEM

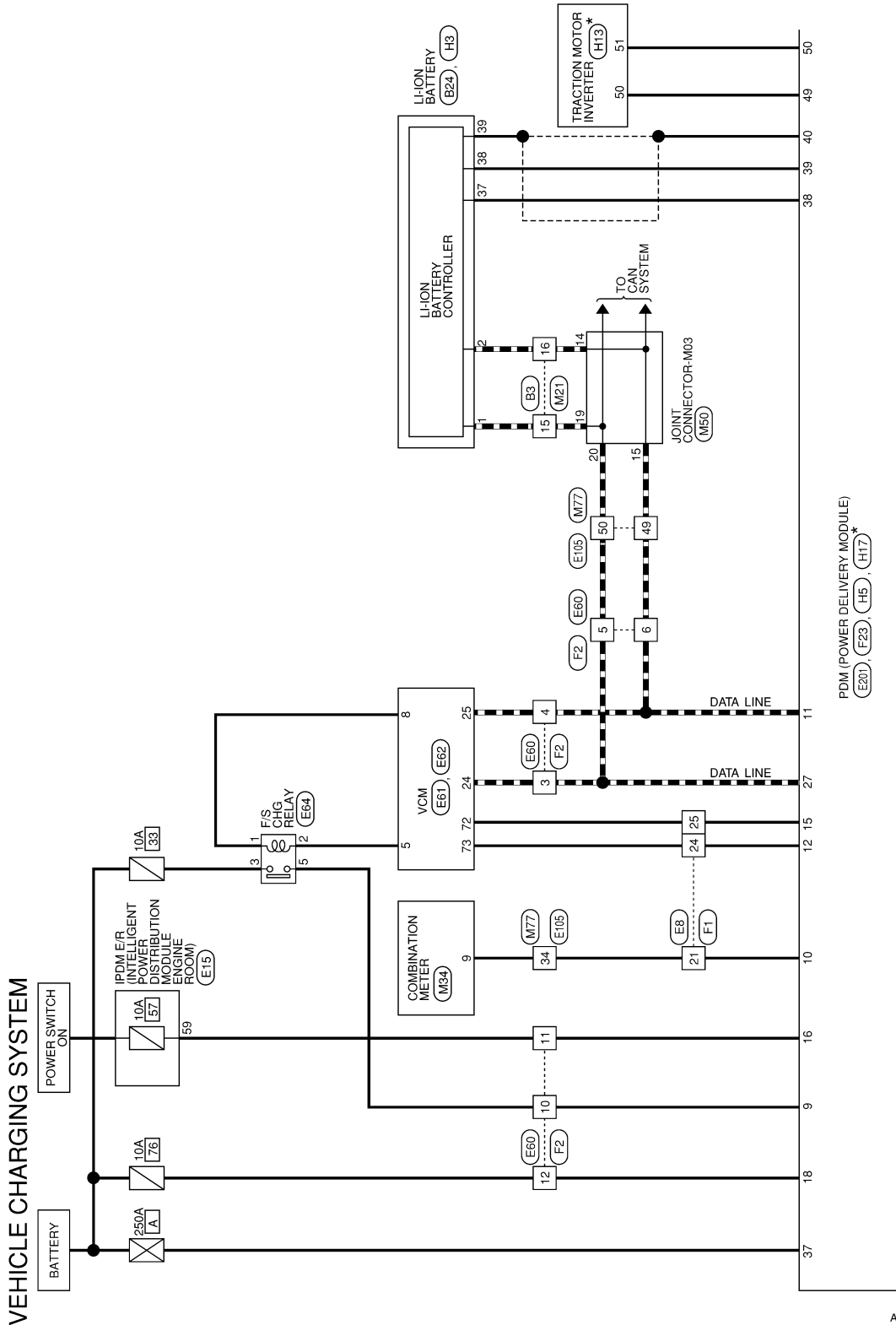
< WIRING DIAGRAM >

## WIRING DIAGRAM

### VEHICLE CHARGING SYSTEM

Wiring Diagram

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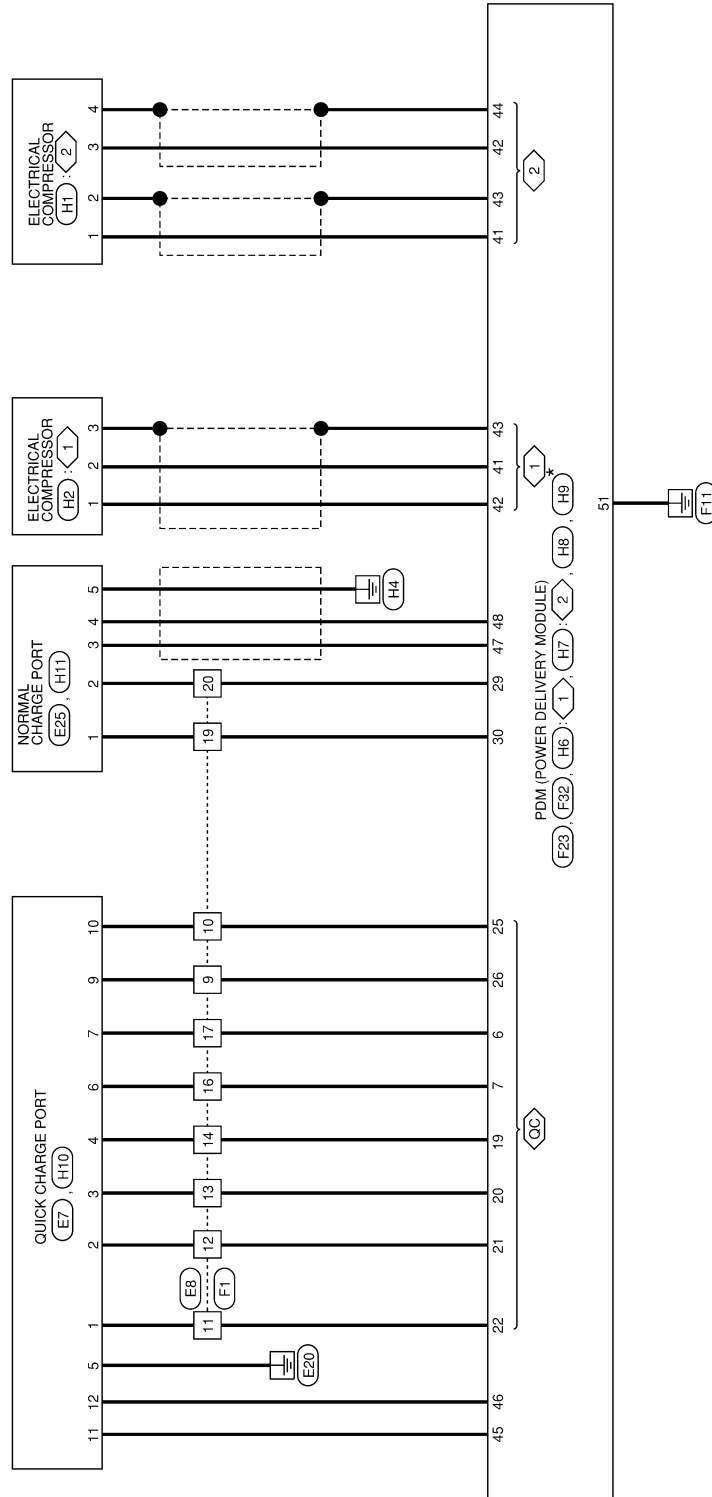


AACWA0016GB

# VEHICLE CHARGING SYSTEM

< WIRING DIAGRAM >

QC : WITH QUICK CHARGE PORT  
1 : WITH HEAT PUMP  
2 : WITHOUT HEAT PUMP



AACWA0017GB

# VEHICLE CHARGING SYSTEM

< WIRING DIAGRAM >

## VEHICLE CHARGING SYSTEM - CONNECTORS

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



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
1	-	-
2	-	-
3	-	-
4	-	-
5	-	-
6	-	-

Terminal No.	Color of Wire	Signal Name
7	B	-
8	SHIELD	-
9	R	-
10	SB	-
11	P	-
12	V	-
13	GR	-
14	P	-
15	L	-
16	G	-
17	-	-
18	-	-
19	-	-

Terminal No.	Color of Wire	Signal Name
20	-	-
21	-	-
22	-	-
23	-	-
24	W	-
25	B	-
26	W	-
27	Y	-
28	-	-
29	W	-
30	L	-
31	L	-
32	P	-

Connector No.	M34
Connector Name	COMBINATION METER
Connector Color	WHITE



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
1	LG	BAT
2	Y	BAT (FOR UPPER)
3	GR	IGN
4	BG	IGN (FOR UPPER)
5	B	GND1 (ILL)
6	B	GND2 (POWER)
7	-	-

Terminal No.	Color of Wire	Signal Name
8	Y	WASHER SW
9	BR	CHARGE CONNECT
10	-	-
11	-	-
12	V	SW GND
13	G	MODE B SW
14	Y	MODE A SW
15	BR	TRIP RESET SW
16	P	ILL CONT UP
17	G	UPPER ILL CONT
18	P	CAN-H
19	L	CAN-L
20	LG	AS SEATBELT W/L
21	-	-
22	GR	GND (FOR UPPER)
23	-	-

Terminal No.	Color of Wire	Signal Name
24	BG	PKB SW
25	SB	BRAKE OIL
26	B	ILL CONT OUT
27	R	A/BAG WARN
28	R	SECURITY
29	-	-
30	GR	8 P/R O/P
31	-	-
32	W	SDA (12C)
33	G	SCL (12C)
34	L	CHARGE LAMP
35	-	-
36	-	-
37	-	-
38	V	LED H LAMP R
39	LG	LED H LAMP L
40	W	BUCKLE SW FR DR

AACIA0097GB

# VEHICLE CHARGING SYSTEM

< WIRING DIAGRAM >

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

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

AACIA0098GB



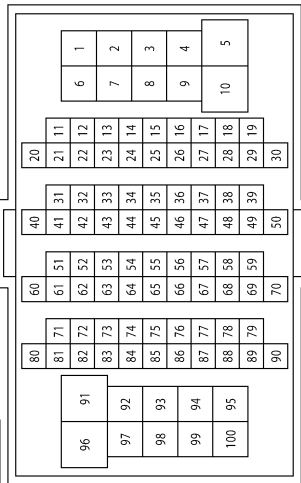
# VEHICLE CHARGING SYSTEM

< WIRING DIAGRAM >

Terminal No.	Color of Wire	Signal Name
60	Y	-
61	GR	-
62	W	-
63	BR	-
64	SHIELD	-
65	W	-
66	LG	-
67	R	-
68	G	-
69	BG	-
70	GR	-
71	R	-
72	R	-
73	B	-
74	W	-
76	L	-
80	W	-
81	LG	-
83	GR	-
84	L	-
85	Y	-
86	SB	-
88	R	-
89	G	-
90	SHIELD	-
91	Y	-
92	BR	-
93	W	-
94	P	-
95	L	-
96	P	-
97	G	-
98	V	-
99	LG	-
100	R	-

Terminal No.	Color of Wire	Signal Name
22	B	-
23	BG	-
24	B	-
26	G	-
27	B	-
28	B	-
25	W	-
29	R	-
31	R	-
32	W	-
33	GR	-
34	BR	-
35	BR	-
36	W	-
37	L	-
38	LG	-
39	SB	-
40	V	-
41	P	-
42	SB	-
43	G	-
44	LG	-
45	Y	-
46	R	-
47	W	-
48	L	-
49	G	-
50	L	-
51	SB	-
52	L	-
54	B	-
55	R	-
56	V	-
57	Y	-
58	L	-

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



Terminal No.	Color of Wire	Signal Name
1	R	-
2	L	-
3	V	-
4	LG	-
6	P	-
7	GR	-
9	G	-
10	L	-
11	L	-
12	Y	-
13	V	-
14	R	-
15	G	-
16	W	-
17	R	-
18	G	-
19	W	-
20	GR	-
21	P	-

AACIA0099GB

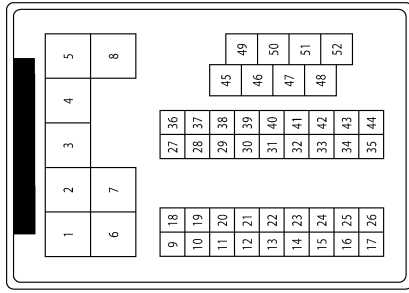
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# VEHICLE CHARGING SYSTEM

## < WIRING DIAGRAM >

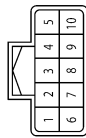
Terminal No.	Color of Wire	Signal Name
19	LG	-
20	W	-
21	-	-
22	-	-
23	-	-
24	O	-
25	P	-
26	-	-
27	-	-
28	-	-
29	-	-
30	-	-
31	-	-
32	-	-
33	-	-
34	-	-
35	R	-
36	G	-
37	V	-
38	P	-
39	B	-
40	O	-
41	L	-
42	-	-
43	-	-
44	B/W	-
45	P	-
46	B/R	-
47	G	-
48	SB	-
49	B/R	-
50	W	-
51	R	-
52	B	-

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



Terminal No.	Color of Wire	Signal Name
1	-	-
2	-	-
3	-	-
4	-	-
5	-	-
6	-	-
7	-	-
8	-	-
9	V	-
10	SB	-
11	Y	-
12	G	-
13	BR	-
14	L	-
15	-	-
16	W	-
17	L	-
18	-	-

Connector No.	E7
Connector Name	QUICK CHARGE PORT
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	Y	-
2	G	-
3	GR	-
4	L	-
5	B	-
6	W	-
7	L	-
8	-	-
9	V	-
10	SB	-

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# VEHICLE CHARGING SYSTEM

## < WIRING DIAGRAM >

Connector No.	E25
Connector Name	NORMAL CHARGE PORT
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	LG	-
2	W	-

Terminal No.	Color of Wire	Signal Name
54	-	-
55	LG	FAST CHARGE
56	-	-
57	R	VCM IGN
58	O	REVERSE LAMP IGN
59	BR	ABS ECU IGN
60	GR	F/S RLY CONT
61	-	-
62	V	E-ACT/HAS IGN

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

53	52	51	50	<div></div>	49	48	47	
62	61	60	59	58	57	56	55	54



Terminal No.	Color of Wire	Signal Name
47	-	-
48	-	-
49	Y	H/LAMP HI RH
50	G	H/LAMP HI LH
51	L	H/LAMP LO LH
52	P	H/LAMP LO RH
53	-	-

Terminal No.	Color of Wire	Signal Name
8	-	-
9	-	-
10	GR	-
11	BR	-
12	Y	-

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

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



Terminal No.	Color of Wire	Signal Name
1	-	-
2	-	-
3	L	-
4	G	-
5	L	-
6	G	-
7	-	-

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# VEHICLE CHARGING SYSTEM

< WIRING DIAGRAM >

Terminal No.	Color of Wire	Signal Name
40	B	PRE-CHARGE RELAY
41	—	—
42	—	—
43	—	—
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
49	R	ACCELERATOR PEDAL POSITION SENSOR 1
50	—	—
51	R	POWER ON POWER SUPPLY
52	—	—
53	—	—
54	W	SYSTEM MAIN RELAY 1
55	—	—
56	G	ENCODER GROUND
57	O	ELECTRIC SHIFT SENSOR GND 1
58	B/R	VCM GROUND
59	—	—
60	—	—
61	—	—
62	B	SENSOR GROUND (ACCELERATOR PEDAL POSITION SENSOR 1)
63	—	—
64	—	—
65	B	VCM GROUND

Terminal No.	Color of Wire	Signal Name
16	R	ELECTRIC SHIFT SENSOR NO.3
17	B	ELECTRIC SHIFT SENSOR NO.1
18	Y	R POSITION OUTPUT (SELECT INDICATOR)
19	W	WATER PUMP SIGNAL
20	G	WATER PUMP SIGNAL
21	GR	F/S RELAY
22	—	—
23	R	CHARGE PORT LID OPENER ACTUATOR RELAY
24	L	EV SYSTEM CAN-H
25	G	EV SYSTEM CAN-L
26	—	—
27	—	—
28	R	SYSTEM MAIN RELAY 2
29	—	—
30	W	READY SIGNAL
31	—	—
32	B	VENC
33	L	N POSITION OUTPUT (SELECT INDICATOR)
34	R	D POSITION OUTPUT (SELECT INDICATOR)
35	—	—
36	W	SENSOR POWER SUPPLY (ACCELERATOR PEDAL POSITION SENSOR 1)
37	—	—
38	—	—
39	R	MOTOR COIL A W-PHASE

Connector No.	E61
Connector Name	VCM
Connector Color	BLACK

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	41	42	43	44	45	46	47	48	49	50	51	52
53	54	55	56	57	58	59	60	61	62	63	64	65



Terminal No.	Color of Wire	Signal Name
1	B	MOTOR COIL A U-PHASE
2	—	—
3	W	ELECTRIC SHIFT SENSOR NO.5
4	—	—
5	LG	F/S RELAY POWER SUPPLY
6	—	—
7	O/L	ELECTRIC SHIFT SENSOR POWER SUPPLY 1
8	W	F/S CHG RELAY
9	SB	PARKING ACTUATOR RELAY A
10	—	—
11	BR	12V BATTERY POWER SUPPLY
12	—	—
13	SB	MOTOR COIL A V-PHASE
14	—	—
15	—	—

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# VEHICLE CHARGING SYSTEM

< WIRING DIAGRAM >

Connector No.	E62
Connector Name	VCM
Connector Color	BROWN



66	67	68	69	70	71	72	73	74	75	76	77	78
79	80	81	82	83	84	85	86	87	88	89	90	91
92	93	94	95	96	97	98	99	100	101	102	103	104
105	106	107	108	109	110	111	112	113	114	115	116	117
118	119	120	121	122	123	124	125	126	127	128	129	130

Terminal No.	Color of Wire	Signal Name
70	SB	REVERSE LAMP RELAY
71	-	-
72	P	CONNECTION DETECTING CIRCUIT SIGNAL
73	O	CONNECTION DETECTING CIRCUIT POWER SUPPLY
74	G	POWER ON POWER SUPPLY
75	L	CAN-H
76	P	CAN-L
78	SB	CHARGE CONNECTOR LOCK RELAY
79	R	12V BATTERY POWER SUPPLY
81	L	CHARGE CONNECTOR LOCK SWITCH (AUTO)
82	GR	CHARGE PORT LIGHT
83	W	ELECTRIC SHIFT SENSOR POWER SUPPLY 2
84	W	ELECTRIC SHIFT SENSOR NO.2
85	G	ELECTRIC SHIFT SENSOR NO.4

Terminal No.	Color of Wire	Signal Name
86	G	ELECTRIC SHIFT SENSOR NO.6
87	V	CHARGE CONNECTOR LOCK SWITCH INDICATOR (LOCK)
88	SB	M/C RELAY
89	BR	CHARGING STATUS INDICATOR 2
90	G	CHARGING STATUS INDICATOR 3
91	O	CHARGE CONNECTOR LOCK SWITCH INDICATOR (AUTO)
92	-	-
93	BR	CHARGE PORT LID OPENER SWITCH
94	O	CHARGE CONNECTOR LOCK SWITCH (LOCK)
95	Y	BATTERY CURRENT SENSOR
96	R	SENSOR POWER SUPPLY (BATTERY CURRENT SENSOR)
97	W	SENSOR POWER SUPPLY (ACCELERATOR PEDAL POSITION SENSOR 2)
98	L	SENSOR POWER SUPPLY (REFRIGERANT PRESSURE SENSOR)
99	R	P POSITION SW NO.1
101	P	STOP LAMP SWITCH
103	L	PLUG IN INDICATOR LAMP
104	R	CHARGE CONNECTOR LOCK RELAY POWER SUPPLY
107	L	BATTERY TEMPERATURE SENSOR
108	R	ACCELERATOR PEDAL POSITION SENSOR 2

Terminal No.	Color of Wire	Signal Name
109	B	REFRIGERANT PRESSURE SENSOR
110	Y	COOLANT TEMPERATURE SENSOR
111	SB	ASCD STEERING SWITCH
112	B	P POSITION SW NO.2
113	O	BRAKE PEDAL POSITION SWITCH
115	V	CHARGING STATUS INDICATOR 1
116	SB	A/C RELAY
117	LG	CHARGE CONNECTOR LOCK ACTUATOR (+)
118	B	VCM GROUND
120	L	SENSOR GROUND (BATTERY CURRENT SENSOR)
121	W	SENSOR GROUND (COOLANT TEMPERATURE SENSOR)
122	B	SENSOR GROUND (ACCELERATOR PEDAL POSITION SENSOR 2)
123	BR	SENSOR GROUND (REFRIGERANT PRESSURE SENSOR)
124	W/L	ELECTRIC SHIFT SENSOR GND 2
125	BR	ASCD STEERING SWITCH GROUND
126	B/R	VCM GROUND
128	V	COOLING FAN CONTROL SIGNAL
129	Y	IMMEDIATE CHARGING SWITCH
130	W	CHARGE CONNECTOR LOCK ACTUATOR (-)

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VEHICLE CHARGING SYSTEM

< WIRING DIAGRAM >

Connector No.	E64
Connector Name	F/S CHG RELAY
Connector Color	BLUE



Terminal No.	Color of Wire	Signal Name
1	Y	-
2	LG	-
3	W	-
5	GR	-

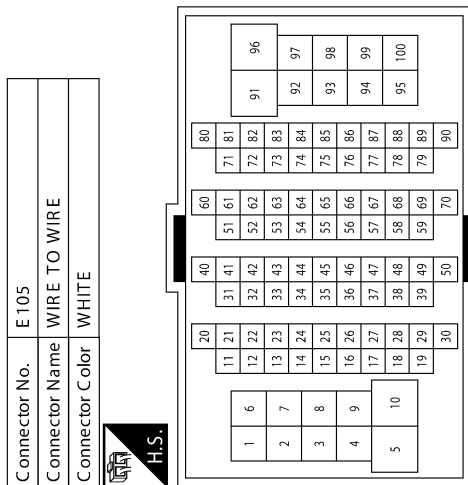
AACIA0121GB

# VEHICLE CHARGING SYSTEM

< WIRING DIAGRAM >

57	Y	-
58	L	-
60	LG	-
61	GR	-
62	W	-
63	SB	-
64	SHIELD	-
65	W	-
66	G	-
67	V	-
68	R	-
69	B	-
70	BR	-
71	LG	-
72	R	-
73	B	-
74	O	-
76	L	-
77	Y	-
80	P	-
81	SB	-
83	GR	-
84	L	-
85	O	-
86	BR	-
88	B	-
89	W	-
90	SHIELD	-
91	Y	-
92	BR	-
93	O	-
94	R	-
95	V	-
96	P	-
97	G	-
98	W	-
99	O	-
100	SB	-

19	W/L	-
20	BR	-
21	R	-
22	B	-
23	LG	-
24	B	-
25	W	-
26	W	-
27	B	-
28	O/L	-
29	W	-
31	R	-
32	W	-
33	G	-
34	BR	-
35	V	-
36	O	-
37	L	-
38	SB	-
39	P	-
40	V	-
41	O	-
42	Y	-
43	BR	-
44	W	-
45	G	-
46	P	-
47	LG	-
47	R	-
48	B	-
49	L	-
50	G	-
51	W	-
52	O	-
54	B	-
55	R	-
56	Y	-



Terminal No.	Color of Wire	Signal Name
1	R	-
2	L	-
3	BW	- (WITHOUT FRONT FOG LAMPS)
3	R	- (WITH LED HEADLAMPS)
4	LG	- (WITH LED HEADLAMPS)
4	B/W	- (WITHOUT FRONT FOG LAMPS)
6	B/R	-
7	W	-
9	G	-
10	R	-
11	L	-
12	Y	-
13	W	-
14	R	-
15	G	-
16	G	-
17	R	-
18	O	-

AACIA0122GB

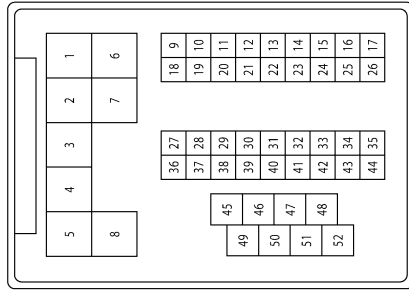
A  
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M  
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# VEHICLE CHARGING SYSTEM

## < WIRING DIAGRAM >

Terminal No.	Color of Wire	Signal Name
19	BR	-
20	W	-
21	LG	-
22	-	-
23	-	-
24	O	-
25	P	-
26	-	-
27	-	-
28	-	-
29	-	-
30	-	-
31	-	-
32	-	-
33	-	-
34	-	-
35	LG	-
36	G	-
37	O	-
38	W	-
39	R	-
40	Y	-
41	L	-
42	-	-
43	-	-
44	SHIELD	-
45	G	-
46	B	-
47	G	-
48	SB	-
49	P	-
49	B	-
50	W	-
51	LG	-
52	B	-

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



Terminal No.	Color of Wire	Signal Name
1	-	-
2	-	-
3	-	-
4	-	-
5	-	-
6	-	-
7	-	-
8	-	-
9	V	-
10	SB	-
11	Y	-
12	G	-
13	BR	-
14	R	-
15	-	-
16	W	-
17	L	-
18	-	-

Connector No.	E201
Connector Name	PDM (POWER DELIVERY MODULE) ON BOARD CHARGER
Connector Color	-



Terminal No.	Color of Wire	Signal Name
37	B/R	-

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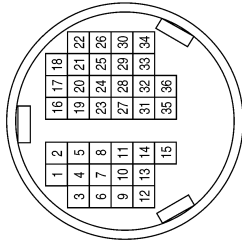


# VEHICLE CHARGING SYSTEM

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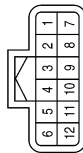
Terminal No.	Color of Wire	Signal Name
21	G	CHSS12
22	Y	CHSS11
23	-	-
24	-	-
25	SB	QCPTMP2
26	V	QCPTMP1
27	L	EV CAN-H
28	-	-
29	W	CONDETI
30	BR	CNTRL
31	-	-
32	-	-
33	-	-
34	-	-
35	-	-
36	-	-

Connector No.	F23
Connector Name	PDM (POWER DELIVERY MODULE)
Connector Color	GREEN



Terminal No.	Color of Wire	Signal Name
1	-	-
2	-	-
3	-	-
4	-	-
5	-	-
6	L	Q-CAN-L
7	W	Q-CAN-H
8	-	-
9	GR	QCRLY
10	LG	CSTATE
11	G	EV CAN-L
12	O	INTERLOCK_IN
13	-	-
14	-	-
15	P	INTERLOCK_OUT
16	V	IGN
17	-	-
18	R	BAT
19	R	CHOKO
20	BR	CHILI

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



Terminal No.	Color of Wire	Signal Name
1	-	-
2	-	-
3	L	-
4	G	-
5	L	-
6	G	-
7	-	-
8	-	-
9	-	-
10	GR	-
11	V	-
12	R	-

AACIA0142GB

# VEHICLE CHARGING SYSTEM

## < WIRING DIAGRAM >

Terminal No.	Color of Wire	Signal Name
19	-	-
20	-	-
21	-	-
22	-	-
23	-	-
24	R	-
25	W	-
26	LG	-
27	Y	-
28	-	-
29	R	-
30	GR	-
31	L	-
32	P	-

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



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

Terminal No.	Color of Wire	Signal Name
1	-	-
2	-	-
3	-	-
4	-	-
5	-	-
6	-	-
7	B	-
8	SHIELD	-
9	B	-
10	SB	-
11	P	-
12	BR	-
13	GR	-
14	P	-
15	L	-
16	G	-
17	-	-
18	-	-

Connector No.	F32
Connector Name	PDM (POWER DELIVERY MODULE)
Connector Color	-



Terminal No.	Color of Wire	Signal Name
51	B/Y	-

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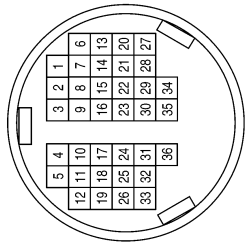
# VEHICLE CHARGING SYSTEM

< WIRING DIAGRAM >

Terminal No.	Color of Wire	Signal Name
21	-	-
22	-	-
23	-	-
24	-	-
25	-	-
26	-	-
27	-	-
28	-	-
29	-	-
30	-	-
31	P	CHG IGN
32	-	-
33	-	-
34	-	-
35	-	-
36	-	-

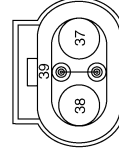
Terminal No.	Color of Wire	Signal Name
5	R	BAT
6	B	GND3
7	B	GND2
8	B	GND1
9	-	-
10	B	PRE CHG GND
11	G	PRE CHG V
12	-	-
13	B	RLY N GND
14	L	RLY N V
15	-	-
16	B	RLY P GND
17	Y	RLY P V
18	-	-
19	-	-
20	-	-

Connector No.	B24
Connector Name	LI-ION BATTERY
Connector Color	GREEN

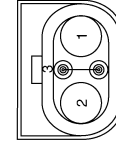


Terminal No.	Color of Wire	Signal Name
1	L	EV CAN-H
2	G	EV CAN-L
3	-	-
4	V	IGN

Connector No.	H3
Connector Name	LI-ION BATTERY
Connector Color	-



Connector No.	H2
Connector Name	ELECTRIC COMPRESSOR (WITH HEAT PUMP)
Connector Color	ORANGE



Connector No.	H1
Connector Name	ELECTRIC COMPRESSOR (WITHOUT HEAT PUMP)
Connector Color	ORANGE



Terminal No.	Color of Wire	Signal Name
37	O	-
38	O	-
39	SHIELD	-

Terminal No.	Color of Wire	Signal Name
1	O	-
2	O	-
3	SHIELD	-

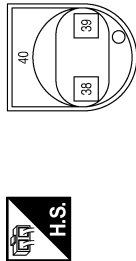
Terminal No.	Color of Wire	Signal Name
1	O	-
2	SHIELD	-
3	SHIELD	-
4	O	-

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# VEHICLE CHARGING SYSTEM

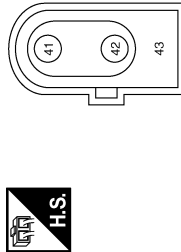
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Connector No.	H5
Connector Name	PDM (POWER DELIVERY MODULE)
Connector Color	BLACK



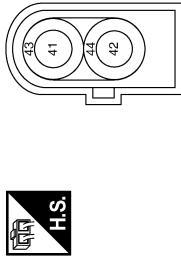
Terminal No.	Color of Wire	Signal Name
38	-	-
39	-	-
40	-	-

Connector No.	H6
Connector Name	PDM (POWER DELIVERY MODULE)
Connector Color	-



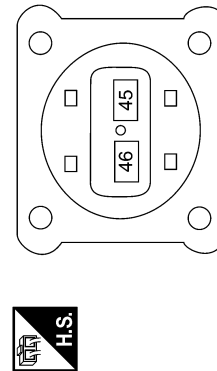
Terminal No.	Color of Wire	Signal Name
41	O	-
42	O	-
43	SHIELD	-

Connector No.	H7
Connector Name	PDM (POWER DELIVERY MODULE)
Connector Color	-



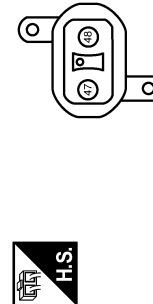
Terminal No.	Color of Wire	Signal Name
41	O	-
42	O	-
43	SHIELD	-
44	SHIELD	-

Connector No.	H8
Connector Name	PDM (POWER DELIVERY MODULE)
Connector Color	-



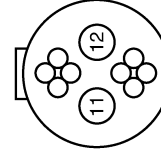
Terminal No.	Color of Wire	Signal Name
45	O	-
46	O	-

Connector No.	H9
Connector Name	PDM (POWER DELIVERY MODULE)
Connector Color	-



Terminal No.	Color of Wire	Signal Name
47	O	-
48	O	-

Connector No.	H10
Connector Name	QUICK CHARGE PORT
Connector Color	-



Terminal No.	Color of Wire	Signal Name
11	O	-
12	O	-

AACIA0145GB

# VEHICLE CHARGING SYSTEM

## < WIRING DIAGRAM >

Connector No.	H17
Connector Name	PDM (POWER DELIVERY MODULE)
Connector Color	-



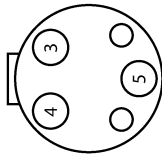
Terminal No.	Color of Wire	Signal Name
49	-	-
50	-	-

Connector No.	H13
Connector Name	TRACTION MOTOR INVERTER
Connector Color	-



Terminal No.	Color of Wire	Signal Name
50	-	-
51	-	-

Connector No.	H11
Connector Name	NORMAL CHARGE PORT
Connector Color	-



Terminal No.	Color of Wire	Signal Name
3	O	-
4	O	-
5	O	-

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# DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

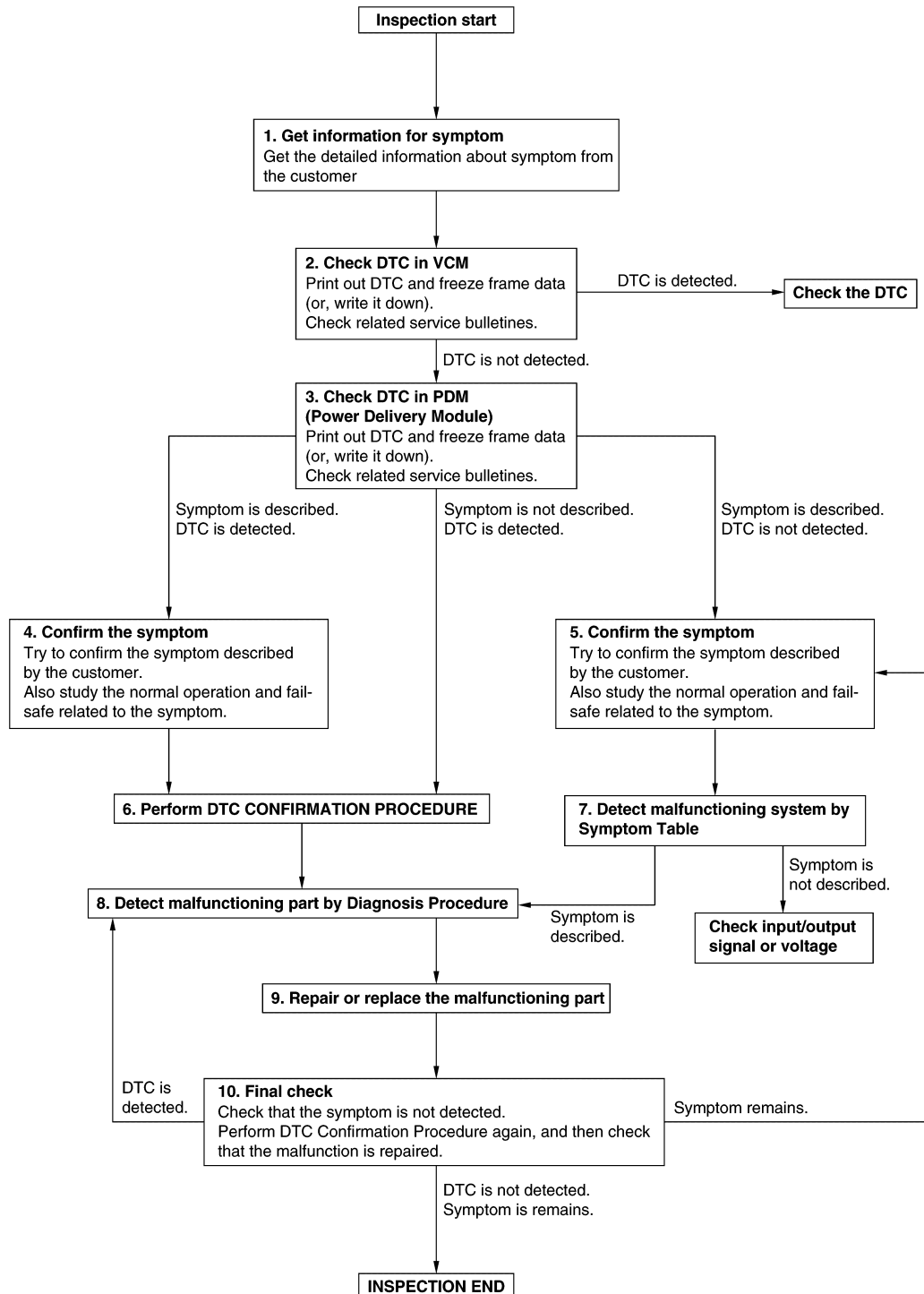
## BASIC INSPECTION

### DIAGNOSIS AND REPAIR WORK FLOW

#### Work Flow

INFOID:000000008746441

#### OVERALL SEQUENCE



JSCIA0790GB

#### DETAILED FLOW

# DIAGNOSIS AND REPAIR WORK FLOW

## < BASIC INSPECTION >

### 1.GET INFORMATION FOR SYMPTOM

Get the detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred) using the "Diagnostic Work Sheet". (Refer to [VC-56, "Diagnostic Work Sheet"](#).)

>> 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 PDM (POWER DELIVERY MODULE)

1. Check DTC in PDM (Power Delivery Module).
2. Perform the following procedure if DTC is displayed.
  - Record DTC and freeze frame data. (Print them out with CONSULT.)
  - Erase DTC.
  - Study the relationship between the cause detected by DTC and the symptom described by the customer. (Symptom Matrix Chart is useful. Refer to [EVC-412, "Symptom Index"](#).)
3. Check related service bulletins for information.

Are any symptoms described and any DTCs detected?

- Symptom is described, DTC is detected>>GO TO 4.  
Symptom is described, DTC is not detected>>GO TO 5.  
Symptom is not described, DTC is detected>>GO TO 6.

### 4.CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer.  
Also study the normal operation and fail-safe related to the symptom. Refer to [VC-110, "Symptom Table"](#) and [EVC-97, "Fail-Safe"](#).  
Diagnosis Work Sheet is useful to verify the incident.  
Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 6.

### 5.CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer.  
Also study the normal operation and fail-safe related to the symptom. Refer to [VC-110, "Symptom Table"](#) and [EVC-97, "Fail-Safe"](#).  
Diagnosis Work Sheet is useful to verify the incident.  
Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 7.

### 6.PERFORM DTC CONFIRMATION PROCEDURE

Perform DTC CONFIRMATION PROCEDURE for the displayed DTC, and then check that DTC is detected again.

#### NOTE:

- Freeze frame data is useful if the DTC is not detected.
- Perform Component Function Check if DTC CONFIRMATION PROCEDURE is not included on Service Manual. This simplified check procedure is an effective alternative though DTC cannot be detected during this check.  
If the result of Component Function Check is NG, it is the same as the detection of DTC by DTC CONFIRMATION PROCEDURE.

Is DTC detected?

- YES >> GO TO 8.

# DIAGNOSIS AND REPAIR WORK FLOW

## < BASIC INSPECTION >

NO >> Check according to [GI-53, "Intermittent Incident"](#).

### 7. DETECT MALFUNCTIONING SYSTEM BY SYMPTOM TABLE

Detect malfunctioning system according to [EVC-412, "Symptom Index"](#) based on the confirmed symptom in step 4, and determine the trouble diagnosis order based on possible causes and symptoms.

#### Is the symptom described?

YES >> GO TO 8.

NO >> Monitor input data from related sensors or check voltage of related PDM (Power Delivery Module) terminals using CONSULT. Refer to [EVC-84, "Reference Value"](#).

### 8. DETECT MALFUNCTIONING PART BY DIAGNOSIS PROCEDURE

Inspect according to Diagnosis Procedure of the system.

#### Is a malfunctioning part detected?

YES >> GO TO 9.

NO >> Check intermittent incident. Refer to [GI-53, "Intermittent Incident"](#).

### 9. REPAIR OR REPLACE THE MALFUNCTIONING PART

1. Repair or replace the malfunctioning part.
2. Reconnect parts or connectors disconnected during Diagnosis Procedure again after repair and replacement.
3. Check DTC. If DTC is displayed, erase it.

>> GO TO 10.

### 10. FINAL CHECK

When DTC was detected in step 3, perform DTC CONFIRMATION PROCEDURE or Component Function Check again, and then check that the malfunction have been completely repaired.

When symptom was described from the customer, refer to confirmed symptom in step 4 or 5, and check that the symptom is not detected.

#### Is DTC detected and does symptom remain?

YES-1 >> DTC is detected: GO TO 8.

YES-2 >> Symptom remains: GO TO 5.

NO >> Before returning the vehicle to the customer, always erase DTC.

## Diagnostic Work Sheet

INFOID:000000008746442

### DESCRIPTION

There are many operating conditions that lead to the malfunction of "charging system" components. A good grasp of such conditions can make troubleshooting faster and more accurate.

KEY POINTS	
WHAT	Vehicle and parts
WHEN	Date, Frequencies
WHERE	Road conditions
HOW	Operating conditions, Weather conditions, Symptoms

In general, each customer feels differently about symptoms. It is important to fully understand the symptoms or conditions for a customer complaint.

Utilize the diagnostic worksheet in order to organize all the information for troubleshooting.

#### **NOTE:**

Some conditions may cause a DTC to be detected.

### DIAGNOSTIC WORKSHEET



# DIAGNOSIS AND REPAIR WORK FLOW

## < BASIC INSPECTION >

Diagnostic worksheet						
Customer name		License plate No.		Date of first registration		
		Model				
Acceptance Date		VIN		Mileage	km (mile)	
Question	Group	Information from the customer				
Vehicle condition at malfunction occurrence	R/Q/N/O	<input type="checkbox"/> READY (R) <input type="checkbox"/> Quick charge (Q) <input type="checkbox"/> Normal charge (N) <input type="checkbox"/> Others (O)				
Symptom	R	<input type="checkbox"/> "READY" not enabled <input type="checkbox"/> Poor drivability <input type="checkbox"/> Shock <input type="checkbox"/> Vibration <input type="checkbox"/> Driving impossible <input type="checkbox"/> Noise <input type="checkbox"/> Poor shifting <input type="checkbox"/> Poor braking <input type="checkbox"/> Poor acceleration <input type="checkbox"/> Low electricity consumption <input type="checkbox"/> Switch malfunction <input type="checkbox"/> Warning lamp ON <input type="checkbox"/> Others ( )				
		Details of symptom				
		Information display indication				
		Electricity consumption		km (mile)/kW		
		Li-ion battery remaining energy		/		
	Q, N	<input type="checkbox"/> Charging unable <input type="checkbox"/> Charging discontinued <input type="checkbox"/> Slow charging <input type="checkbox"/> Poor timer charging <input type="checkbox"/> Poor remote charging <input type="checkbox"/> Immediate charging unable <input type="checkbox"/> Others ( )				
		Details of symptom				
		Quick charger monitor indication				
	O	<input type="checkbox"/> A/C inoperative <input type="checkbox"/> Poor A/C <input type="checkbox"/> Dead 12V battery <input type="checkbox"/> Others ( )				
		Details of symptom				
	Location/status of occurrence	R/O	<input type="checkbox"/> Not applicable <input type="checkbox"/> Ordinary road <input type="checkbox"/> Highway <input type="checkbox"/> Mountain pass <input type="checkbox"/> Rough road <input type="checkbox"/> Level road <input type="checkbox"/> Uphill <input type="checkbox"/> Downhill <input type="checkbox"/> Left/right turn <input type="checkbox"/> Others ( )			
		Q/N/O	<input type="checkbox"/> Start of charge <input type="checkbox"/> During charging <input type="checkbox"/> After the end of charging <input type="checkbox"/> During standby of timer charging <input type="checkbox"/> During timer charging <input type="checkbox"/> At the end of timer charging <input type="checkbox"/> During remote charging <input type="checkbox"/> Others ( )			
Driving condition	R	<input type="checkbox"/> At the system startup <input type="checkbox"/> During READY (Vehicle stopped) <input type="checkbox"/> At start <input type="checkbox"/> During acceleration <input type="checkbox"/> During driving with a constant speed <input type="checkbox"/> During coasting <input type="checkbox"/> During braking <input type="checkbox"/> Right before stopping <input type="checkbox"/> Right after stopping <input type="checkbox"/> During POWER OFF operation <input type="checkbox"/> A/C ON <input type="checkbox"/> During shift change <input type="checkbox"/> Others ( )				
		Vehicle speed		km (MPH)		
		Accelerator pedal opening angle		/ 8		

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## < BASIC INSPECTION >

Question	Group	Information from the customer		
Quick charger	Q	Quick charger maker	<input type="checkbox"/> Not applicable <input type="checkbox"/> Applicable ( )	
		Location		
		Model number		
		Serial number		
		Setting		
		Others		
EVSE	N	Manufacturer	<input type="checkbox"/> Genuine <input type="checkbox"/> Other ( )	
Wall outlet	N	<input type="checkbox"/> Not applicable <input type="checkbox"/> Applicable		
		Location		
		Voltage	V	
		Breaker	A	
		Other information		
Li-ion battery remaining energy	Q/N/O	<input type="checkbox"/> Not applicable <input type="checkbox"/> Applicable ( )		
Shift position/operation	R	<input type="checkbox"/> P <input type="checkbox"/> R <input type="checkbox"/> N <input type="checkbox"/> D <input type="checkbox"/> ECO <input type="checkbox"/> When operating (   ⇒   )		
Weather condition	R/Q/N/O	<input type="checkbox"/> Not applicable <input type="checkbox"/> Applicable		
		Weather		
		Temperature	°C (or °F)	
Occurrence frequency		<input type="checkbox"/> All the time <input type="checkbox"/> Once <input type="checkbox"/> Sometimes (   times in the past) <input type="checkbox"/> Others ( )		
		<input type="checkbox"/> POWER OFF <input type="checkbox"/> Removal of 12V battery terminal <input type="checkbox"/> Shift lever operation <input type="checkbox"/> During driving <input type="checkbox"/> READY <input type="checkbox"/> Others ( )		
Timing of recovery from mal-function				

# CHARGE PORT

< PERIODIC MAINTENANCE >

## PERIODIC MAINTENANCE

### CHARGE PORT

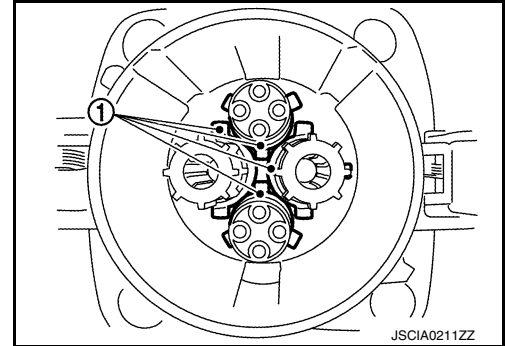
#### Inspection

INFOID:000000008746443

#### INSPECTION PROCEDURES

##### Quick Charge Port

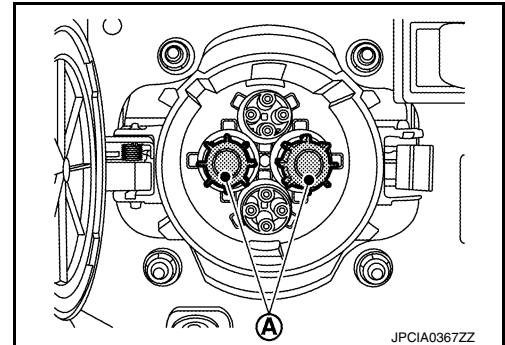
1. Perform the following visual inspections.
  - Dust and foreign matter in the quick charge port and normal charge port
  - Damage in the quick charge port and normal charge port
  - Malfunction in opening/closing the charge port caps and looseness when closed and locked.
  - Cracks in the packing ① of quick charge port



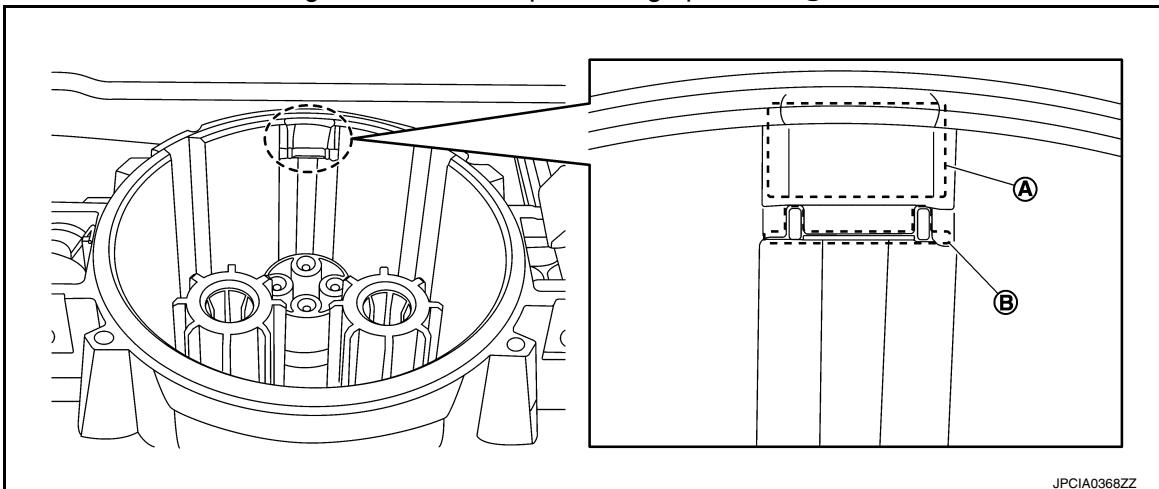
- Check that the quick charge port terminals ② are not welded.

#### **CAUTION:**

If they are welded, inspect the quick charge gun used for the last charge, and replace the quick charge port. For replacement of the quick charge port, refer to [VC-135, "Removal and Installation"](#).



- Check that there is no irregular wear of the quick charge port lock ③.



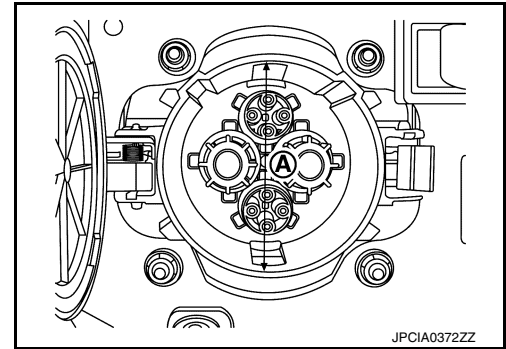
- If the port is damaged, for example if the metal plate ④ on the inside is lost, replace the quick charge port. For replacement of the quick charge port, refer to [VC-135, "Removal and Installation"](#).

# CHARGE PORT

## < PERIODIC MAINTENANCE >

- If irregular wear is found at the visual inspection, check the charge port inner diameter (A) and replace the quick charge port if the limit value is exceeded.

**Repair limit : 71 mm (2.80 in)**

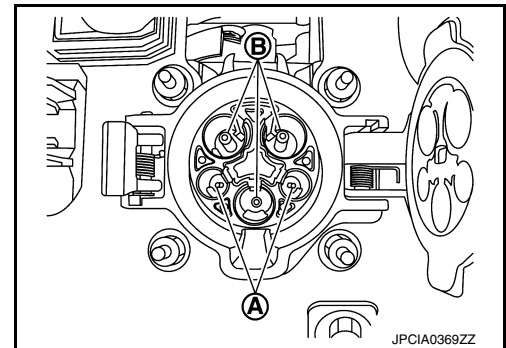


### Normal Charge Port

1. Perform the following visual inspections.
  - Dust and foreign matter in the quick charge port and normal charge port
  - Damage in the quick charge port and normal charge port
  - Malfunction in opening/closing the charge port caps and looseness when closed and locked.
  - Check that the normal charge port terminals (A) are not bent.
  - Check that the contact prevention cap (B) is not missing.

**NOTE:**

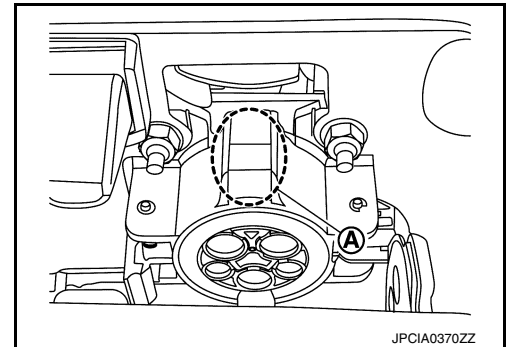
If it is missing, it is extremely difficult to engage the charge connector.



- Check that there is no snow or ice on the normal charge port top side (A).

**NOTE:**

If snow or ice reaches the charge connector lock, charging does not start.



### Handling of charge port

#### Cleaning of charge port

If the charge port becomes dirty, clean the port with an air blow gun.

#### Handling of damaged cap

Perform the following procedure if the cap becomes damaged:

- Replace charge port cap if the charge port cap becomes damaged
- Replace charge port if the packing of quick charge port becomes cracked.
- Replace charge port if the terminal of quick charge port or normal charge port becomes damaged.

#### Cleaning of the inside of rubber cap

If air does not exit through the rubber cap hole, remove the rubber cap from the port and clean the inside so that air exits through the rubber cap hole.

# POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

## DTC/CIRCUIT DIAGNOSIS

### POWER SUPPLY AND GROUND CIRCUIT

#### PDM (POWER DELIVERY MODULE)

#### PDM (POWER DELIVERY MODULE) : Diagnosis Procedure

INFOID:000000009300061

#### 1.CHECK FUSE

Check that the following fuse is not fusing.

Power supply	Fuse No.	Capacity
12V battery power	76	10 A
Power switch ON	57	10 A

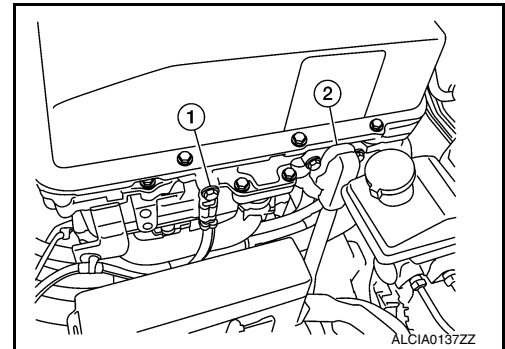
##### Is the fuse fusing?

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

NO >> GO TO 2.

#### 2.CHECK 12V BATTERY CABLE ON PDM (POWER DELIVERY MODULE) SIDE

1. Turn power switch OFF.
2. Check the installation of 12V battery negative cable① and 12V battery positive cable②. [PDM (Power Delivery Module) side.]



##### Is the inspection result normal ?

YES >> GO TO 3.

NO >> Repair or replace 12V battery negative cable or positive cable on PDM (Power Delivery Module) side connection.

#### 3.CHECK 12V BATTERY NEGATIVE CABLE ON PDM (POWER DELIVERY MODULE) SIDE

Check the continuity between 12V battery negative cable on PDM (Power Delivery Module) side and ground.

+		-	Continuity
PDM (Power Delivery Module)			
Connector	Terminal		
F32	51	Ground	Existed

##### Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

#### 4.12V BATTERY POWER SUPPLY

## POWER SUPPLY AND GROUND CIRCUIT

### < DTC/CIRCUIT DIAGNOSIS >

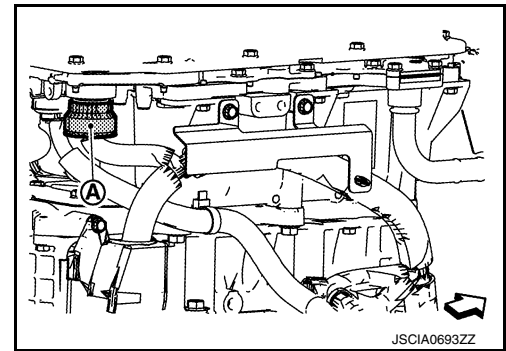
1. Disconnect PDM (Power Delivery Module) harness connector(A).

↶ : Vehicle front

#### NOTE:

Loosen the PDM (Power Delivery Module) harness connector by rotating it counterclockwise and remove it.

2. Check the voltage between PDM (Power Delivery Module) harness connector and ground.



+		-	Voltage
PDM (Power Delivery Module)			
Connector	Terminal		
F23	18	Ground	12V battery voltage

#### Is the inspection result normal?

YES >> GO TO 5.

NO >> Perform the trouble diagnosis for 12V battery power supply circuit.

### 5.CHECK POWER SWITCH ON POWER SUPPLY

1. Turn power switch ON.
2. Check the voltage between PDM (Power Delivery Module) harness connector and ground.

+		-	Voltage (Approx.)
PDM (Power Delivery Module)			
Connector	Terminal		
F23	16	Ground	11 – 14 V

#### Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 6.

### 6.CHECK POWER SWITCH ON POWER SUPPLY CIRCUIT

1. Turn power switch OFF.
2. Disconnect IPDM E/R harness connector.
3. Check the continuity between PDM (Power Delivery Module) harness connector and IPDM E/R harness connector.

PDM (Power Delivery Module)		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
F23	16	E15	59	Existed

#### Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to [PCS-29. "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

# U1000 CAN COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

## U1000 CAN COMMUNICATION

### Description

INFOID:000000009300062

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

### DTC Logic

INFOID:000000009300063

### DTC DETECTION LOGIC

DTC	CONSULT display (Malfunction type)	DTC detection condition	Possible causes
U1000	CAN COMM CIRCUIT (Missing message)	The PDM (Power Delivery Module) is unable to send or receive EV system CAN communication continually for 2 seconds or more.	Harness and connector (EV system CAN communication line circuit is open or shorted.)
	CAN COMM CIRCUIT (Erratic)		
	CAN COMM CIRCUIT (Electrical malfunction)		

### DTC CONFIRMATION PROCEDURE

#### 1.PERFORM DTC CONFIRMATION PROCEDURE

##### With CONSULT

1. Turn power switch ON and wait for 5 seconds or more.
2. Check "Self-diagnosis result" of "CHARGER/PD MODULE".

##### Is DTC detected?

- YES >> Proceed to [VC-63, "Diagnosis Procedure"](#).  
NO >> INSPECTION END

### Diagnosis Procedure

INFOID:000000009300064

Perform the trouble diagnosis for CAN communication system. Refer to [LAN-16, "Trouble Diagnosis Flow Chart"](#).

# U1008, U100B QUICK CHARGER COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

## U1008, U100B QUICK CHARGER COMMUNICATION

### Description

INFOID:000000009300065

Quick charger communication is a serial communication line for real time application. It is a multiplex communication line with high data communication speed and excellent error detection ability. PDM (Power Delivery Module) and quick charger are connected with two communication lines (quick charger communication H-line and quick charger communication L-line) and transmit/receive data.

### DTC Logic

INFOID:000000009300066

#### DTC DETECTION LOGIC

##### CAUTION:

This DTC may be detected when there is a quick charger malfunction. Therefore if this DTC is detected, check that there are no malfunctions in the quick charger.

DTC	CONSULT display (Malfunction type)	DTC detection condition	Possible causes
U1008	QUICK CHARGER COMM (Missing message)	The PDM (Power Delivery Module) is unable to send or receive quick charger communication continually for 2 seconds or more.	<ul style="list-style-type: none"><li>• Harness and connector (Quick charger communication line circuit is open or shorted.)</li><li>• Quick charger</li><li>• Quick charge port</li><li>• PDM (Power Delivery Module)</li></ul>
	QUICK CHARGER COMM (Erratic)		
U100B	QUICK CHARGER COMM (Missing message)		
	QUICK CHARGER COMM (Erratic)		

#### DTC CONFIRMATION PROCEDURE

##### 1.PERFORM DTC CONFIRMATION PROCEDURE

###### Ⓐ With CONSULT

1. Perform quick charging for 5 seconds or more.
2. Turn power switch ON.
3. Check "Self-diagnosis result" of "CHARGER/PD MODULE".

###### Is DTC detected?

- YES >> Proceed to [VC-64, "Diagnosis Procedure"](#).  
NO >> INSPECTION END

### Diagnosis Procedure

INFOID:000000009300067

##### 1.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

###### Ⓐ With CONSULT

1. Turn power switch ON.
2. Erase DTC.
3. Turn power switch OFF.
4. Perform DTC confirmation procedure again by using a quick charger other than the one is used for the previous DTC confirmation procedure. Refer to [VC-64, "DTC Logic"](#)

###### Is the DTC detected again?

- YES >> GO TO 2.  
NO >> INSPECTION END (Quick charger malfunction)

##### 2.CHECK QUICK CHARGE PORT CONDITION

Check for any adhering foreign substances, cracking or damage on the quick charge port. Refer to [VC-59, "Inspection"](#).

###### Is the inspection result normal?

- YES >> GO TO 3.  
NO >> Clean or replace the quick charge port. Refer to [VC-135, "Removal and Installation"](#).



# U1008, U100B QUICK CHARGER COMMUNICATION

## < DTC/CIRCUIT DIAGNOSIS >

### 3.CHECK QUICK CHARGE PORT

Check the quick charge port. Refer to [VC-65, "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace quick charge port. Refer to [VC-135, "Removal and Installation"](#).

### 4.CHECK QUICK CHARGER COMMUNICATION CIRCUIT

1. Disconnect PDM (Power Delivery Module) harness connector①.

← : Vehicle front

#### NOTE:

Loosen the PDM (Power Delivery Module) harness connector by rotating it counterclockwise and remove it.

2. Check the continuity between quick charge port harness connector and PDM (Power Delivery Module) harness connector.

Quick charge port		PDM (Power Delivery Module)		Continuity
Connector	Terminal	Connector	Terminal	
E7	1	F23	22	Existed
	2		21	

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

### 5.CHECK QUICK CHARGER COMMUNICATION GROUND CIRCUIT

Check the continuity between quick charge port harness connector and ground.

+		-	Continuity
Quick charge port			
Connector	Terminal		
E7	5	Ground	Existed

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

### 6.CHECK INTERMITTENT INCIDENT

Check the intermittent incident. Refer to [GI-53, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace PDM (Power Delivery Module). Refer to [VC-119, "Removal and Installation"](#).

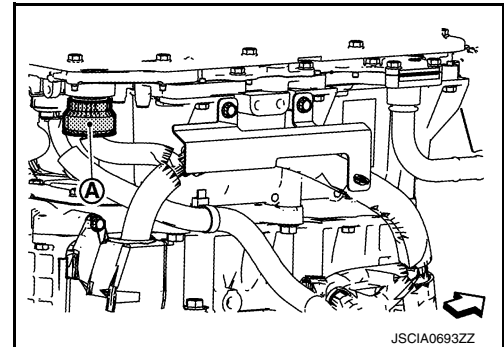
NO >> Repair or replace error-detected parts.

## Component Inspection

INFOID:000000009300068

### 1.CHECK QUICK CHARGE PORT

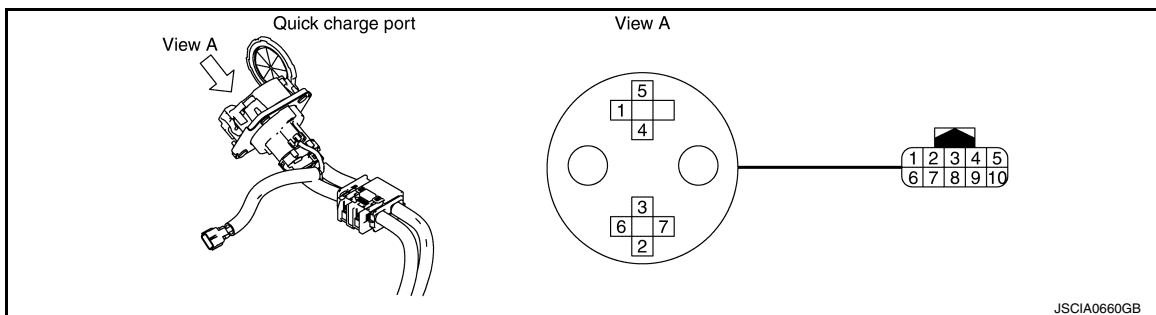
1. Disconnect quick charge port harness connector.



## U1008, U100B QUICK CHARGER COMMUNICATION

### < DTC/CIRCUIT DIAGNOSIS >

2. Check the continuity between quick charge port terminals and quick charge port side harness connector of same terminals.



Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace quick charge port. Refer to [VC-135, "Removal and Installation"](#).

### 2.CHECK QUICK CHARGE PORT TEMPERATURE SENSOR

Check the resistance between quick charge port side harness connector terminals.

Quick charge side harness connector		Condition		Resistance (kΩ)
Terminal				
5	9	Temperature [°C (°F)]	-40 – 50 (-40 – 122)	4 – 170
	10			

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace quick charge port. Refer to [VC-135, "Removal and Installation"](#).

# U100A CAN COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

## U100A CAN COMMUNICATION

### Description

INFOID:000000009300069

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

### DTC Logic

INFOID:000000009300070

### DTC DETECTION LOGIC

DTC	CONSULT display (Malfunction type)	DTC detection condition	Possible causes
U100A	CAN COMM ERROR (Missing message)	The PDM (Power Delivery Module) is unable to send or receive EV system CAN communication continually for 2 seconds or more.	Harness and connector (EV system CAN communication line circuit is open or shorted.)

### DTC CONFIRMATION PROCEDURE

#### 1.PERFORM DTC CONFIRMATION PROCEDURE

##### With CONSULT

1. Turn power switch ON and wait for 5 seconds or more.
2. Check "Self-diagnosis result" of "CHARGER/PD MODULE".

##### Is DTC detected?

- YES >> Proceed to [VC-67, "Diagnosis Procedure"](#).  
NO >> INSPECTION END

### Diagnosis Procedure

INFOID:000000009300071

Perform the trouble diagnosis for CAN communication system. Refer to [LAN-16, "Trouble Diagnosis Flow Chart"](#).

## U1010 CONTROL MODULE (CAN)

< DTC/CIRCUIT DIAGNOSIS >

### U1010 CONTROL MODULE (CAN)

#### DTC Logic

INFOID:000000009300072

#### DTC DETECTION LOGIC

DTC	CONSULT display (Malfunction type)	DTC detection condition	Possible causes
U1010	CONTROL UNIT (CAN) (Internal electric malfnctn)	In a self-test of CAN control unit, when PDM (Power Delivery Module) is under conditions that a write value and a read value do not match one time or more out of two attempts, and after that, they never match even after 100 attempts.	PDM (Power Delivery Module)
	CONTROL UNIT (CAN) (Electrical malfunction)		

#### DTC CONFIRMATION PROCEDURE

##### 1.PERFORM DTC CONFIRMATION PROCEDURE

###### With CONSULT

1. Turn power switch ON and wait for 5 seconds or more.
2. Check "Self-diagnosis result" of "CHARGER/PD MODULE".

###### Is DTC detected?

- YES >> Proceed to [VC-68, "Diagnosis Procedure"](#).  
NO >> INSPECTION END

#### Diagnosis Procedure

INFOID:000000009300073

##### 1.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

###### With CONSULT

1. Turn power switch ON.
2. Erase DTC.
3. Perform DTC confirmation procedure again. Refer to [VC-68, "DTC Logic"](#).

###### Is the DTC detected again?

- YES >> Replace PDM (Power Delivery Module). Refer to [VC-67, "Diagnosis Procedure"](#).  
NO >> INSPECTION END

# B2801 QUICK CHARGE CONNECTOR

< DTC/CIRCUIT DIAGNOSIS >

## B2801 QUICK CHARGE CONNECTOR

### DTC Logic

INFOID:000000009300074

### DTC DETECTION LOGIC

#### CAUTION:

This DTC may be detected when there is a quick charger malfunction. Therefore if this DTC is detected, check that there are no malfunctions in the quick charger.

DTC	CONSULT display (Malfunction type)	DTC detection condition	Possible causes
B2801	A	Q/CHG ACTIVATION SIG ERROR (Signal invalid)	Quick charger connector disconnection is detected while receiving the quick charge start/stop 1 signal that is transmitted from the quick charger.
	B	Q/CHG ACTIVATION SIG ERROR (Signal stuck high)	The connector connection confirmation signal is detected continuously for 3 seconds or more because the signal line cut-off circuit is stuck ON during quick charging.

### DTC CONFIRMATION PROCEDURE

#### 1.PERFORM DTC CONFIRMATION PROCEDURE

##### With CONSULT

1. Turn power switch OFF.
2. Connect the quick charger connector to the quick charge port.
3. Turn ON the quick charger start switch and wait for 1 minute or more.
4. Turn power switch ON.
5. Check "Self-diagnosis result" of "CHARGER/PD MODULE".

##### Is DTC detected?

YES (TYPE A)>>Proceed to [VC-69, "TYPE A : Diagnosis Procedure"](#).

YES (TYPE B)>>Proceed to [VC-71, "TYPE B : Diagnosis Procedure"](#).

NO >> INSPECTION END

#### TYPE A

#### TYPE A : Diagnosis Procedure

INFOID:000000009300075

#### 1.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

##### With CONSULT

1. Turn power switch ON.
2. Erase DTC.
3. Turn power switch OFF.
4. Perform DTC confirmation procedure again by using a quick charger other than the one is used for the previous DTC confirmation procedure. Refer to [VC-69, "DTC Logic"](#)

##### Is DTC detected?

YES >> GO TO 2.

NO >> INSPECTION END (Quick charger malfunction).

#### 2.CHECK QUICK CHARGE PORT CONDITION

Check for any adhering foreign substances, cracking or damage on the quick charge port. Refer to [VC-59, "Inspection"](#).

##### Is the inspection result normal?

YES >> GO TO 3.

NO >> Clean or replace the quick charge port. Refer to [VC-135, "Removal and Installation"](#).

## B2801 QUICK CHARGE CONNECTOR

### < DTC/CIRCUIT DIAGNOSIS >

#### 3.CHECK QUICK CHARGE PORT

Check the quick charge port. Refer to [VC-72. "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace quick charge port. Refer to [VC-135. "Removal and Installation"](#).

#### 4.CHECK QUICK CHARGER CONNECTION SIGNAL POWER SUPPLY (1)

Check the voltage between quick charge port harness connector terminals.

Quick charge port			Voltage
Connector	+	–	
	Terminal		
E7	3	5	12V battery voltage

Is the inspection result normal?

YES >> GO TO 8.

NO >> GO TO 5.

#### 5.CHECK QUICK CHARGER CONNECTION SIGNAL POWER SUPPLY (2)

Check the voltage between quick charge port harness connector and ground.

+		–	Voltage
Quick charge port			
Connector	Terminal		
E7	3	Ground	12V battery voltage

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6.

#### 6.CHECK QUICK CHARGER CONNECTION SIGNAL POWER SUPPLY CIRCUIT

1. Disconnect PDM (Power Delivery Module) harness connector(A).

↶ : Vehicle front

##### NOTE:

Loosen the PDM (Power Delivery Module) harness connector by rotating it counterclockwise and remove it.

2. Check the continuity between quick charge port harness connector and PDM (Power Delivery Module) harness connector.

Quick charge port		PDM (Power Delivery Module)		Continuity
Connector	Terminal	Connector	Terminal	
E7	3	F23	20	Existed

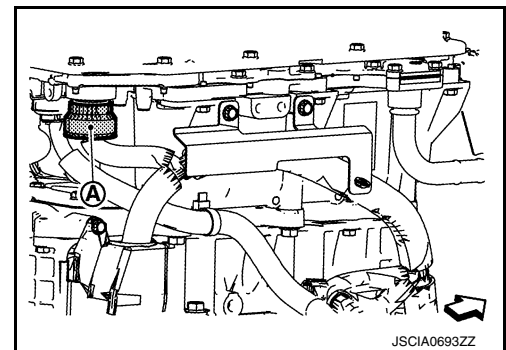
Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair or replace error-detected parts.

#### 7.CHECK QUICK CHARGER CONNECTION SIGNAL GROUND CIRCUIT

Check the continuity between quick charge port harness connector and ground.



## B2801 QUICK CHARGE CONNECTOR

### < DTC/CIRCUIT DIAGNOSIS >

+		-	Continuity
Quick charge port			
Connector	Terminal		
E7	5	Ground	Existed

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair or replace error-detected parts.

### 8.CHECK QUICK CHARGE START/STOP 1 SIGNAL CIRCUIT

1. Disconnect PDM (Power Delivery Module) harness connector(A).

↶ : Vehicle front

#### NOTE:

Loosen the PDM (Power Delivery Module) harness connector by rotating it counterclockwise and remove it.

2. Check the continuity between quick charge port harness connector and PDM (Power Delivery Module) harness connector.

Quick charge port		PDM (Power Delivery Module)		Continuity
Connector	Terminal	Connector	Terminal	
E7	1	F23	22	Existed

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair or replace error-detected parts.

### 9.CHECK INTERMITTENT INCIDENT

Check the intermittent incident. Refer to [GI-53, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace PDM (Power Delivery Module). Refer to [VC-119, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

### TYPE B

#### TYPE B : Diagnosis Procedure

INFOID:000000009300076

### 1.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

#### ⓘ With CONSULT

1. Turn power switch ON.
2. Erase DTC.
3. Turn power switch OFF.
4. Perform DTC confirmation procedure again by using a quick charger other than the one is used for the previous DTC confirmation procedure. Refer to [VC-69, "DTC Logic"](#)

Is the DTC detected again?

YES >> GO TO 2.

NO >> INSPECTION END (Quick charger malfunction)

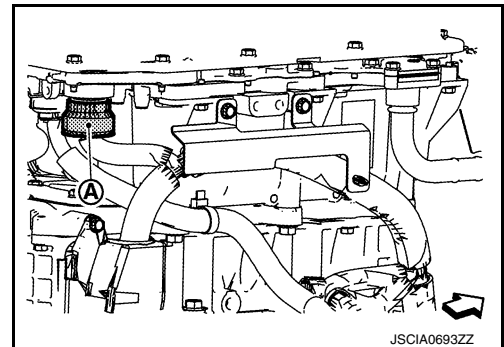
### 2.CHECK INTERMITTENT INCIDENT

Check the intermittent incident. Refer to [GI-53, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace PDM (Power Delivery Module). Refer to [VC-119, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.



# B2801 QUICK CHARGE CONNECTOR

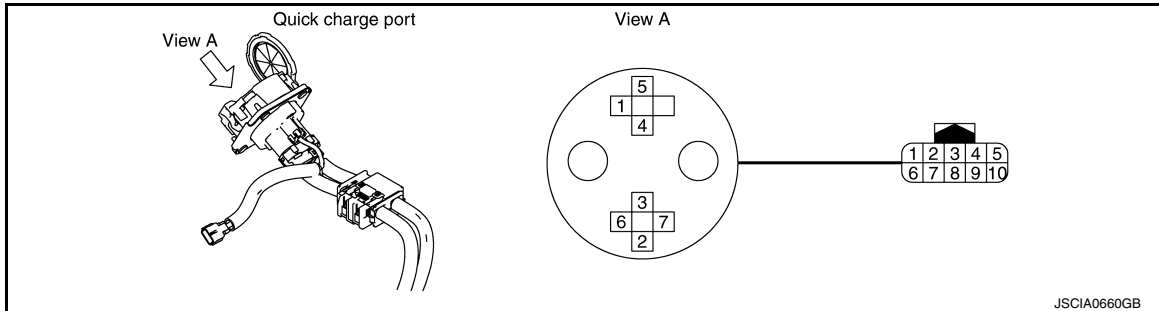
< DTC/CIRCUIT DIAGNOSIS >

## Component Inspection

INFOID:000000009301065

### 1.CHECK QUICK CHARGE PORT

1. Disconnect quick charge port harness connector.
2. Check the continuity between quick charge port terminals and quick charge port side harness connector of same terminals.



Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace quick charge port. Refer to [VC-135, "Removal and Installation"](#).

### 2.CHECK QUICK CHARGE PORT TEMPERATURE SENSOR

Check the resistance between quick charge port side harness connector terminals.

Quick charge side harness connector		Condition		Resistance (kΩ)
Terminal				
5	9	Temperature [°C (°F)]	-40 – 50 (-40 – 122)	4 – 170
	10			

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace quick charge port. Refer to [VC-135, "Removal and Installation"](#).



# B2802 QUICK CHARGER

< DTC/CIRCUIT DIAGNOSIS >

## B2802 QUICK CHARGER

### DTC Logic

INFOID:000000009300078

### DTC DETECTION LOGIC

#### CAUTION:

This DTC may be detected when there is a quick charger malfunction. Therefore if this DTC is detected, check that there are no malfunctions in the quick charger.

DTC	CONSULT display (Malfunction type)	DTC detection condition	Possible causes
B2802	Q/CHG ISOLATION SIGNAL ERROR (Signal stuck high)	The quick charge start/stop 2 signal that is transmitted from the quick charger at the start of quick charging is not received.	<ul style="list-style-type: none"><li>• Harness and connector (Quick charger communication line circuit is open or shorted.)</li><li>• Quick charger</li><li>• Quick charge port</li><li>• PDM (Power Delivery Module)</li></ul>
	Q/CHG ISOLATION SIGNAL ERROR (Signal stuck low)	The quick charge start/stop 2 signal that is transmitted from the quick charger at the start of quick charging is received at an incorrect time.	

### DTC CONFIRMATION PROCEDURE

#### 1.PERFORM DTC CONFIRMATION PROCEDURE

##### Ⓜ With CONSULT

1. Turn power switch OFF.
2. Connect the quick charger connector to the quick charge port.
3. Turn ON the quick charger start switch and wait for 1 minute or more.
4. Turn power switch ON.
5. Check "Self-diagnosis result" of "CHARGER/PD MODULE".

##### Is DTC detected?

- YES >> Proceed to [VC-73, "Diagnosis Procedure"](#).  
NO >> INSPECTION END

### Diagnosis Procedure

INFOID:000000009300079

#### 1.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

##### Ⓜ With CONSULT

1. Turn power switch ON.
2. Erase DTC.
3. Turn power switch OFF.
4. Perform DTC confirmation procedure again by using a quick charger other than the one is used for the previous DTC confirmation procedure. Refer to [VC-73, "DTC Logic"](#)

##### Is DTC detected?

- YES >> GO TO 2.  
NO >> INSPECTION END (Quick charger malfunction).

#### 2.CHECK QUICK CHARGE PORT CONDITION

Check for any adhering foreign substances, cracking or damage on the quick charge port. Refer to [VC-59, "Inspection"](#).

##### Is the inspection result normal?

- YES >> GO TO 3.  
NO >> Clean or replace the quick charge port. Refer to [VC-135, "Removal and Installation"](#).

#### 3.CHECK QUICK CHARGE PORT

Check the quick charge port. Refer to [VC-74, "Component Inspection"](#).

##### Is the inspection result normal?

- YES >> GO TO 4  
NO >> Replace quick charge port. Refer to [VC-135, "Removal and Installation"](#).

#### 4.CHECK QUICK CHARGER COMMUNICATION CIRCUIT

## B2802 QUICK CHARGER

### < DTC/CIRCUIT DIAGNOSIS >

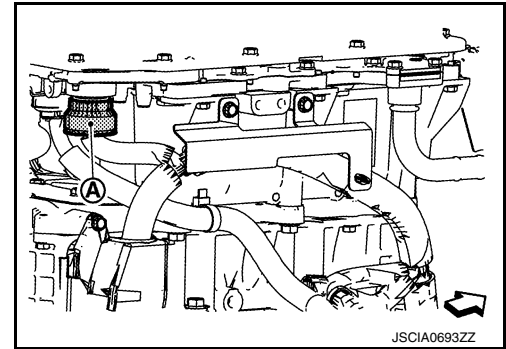
1. Disconnect PDM (Power Delivery Module) harness connector(A).

↩ : Vehicle front

#### NOTE:

Loosen the PDM (Power Delivery Module) harness connector by rotating it counterclockwise and remove it.

2. Check the continuity between quick charge port harness connector and PDM (Power Delivery Module) harness connector.



Quick charge port		PDM (Power Delivery Module)		Continuity
Connector	Terminal	Connector	Terminal	
E7	2	F23	21	Existed
	4		19	

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

### 5.CHECK INTERMITTENT INCIDENT

Check the intermittent incident. Refer to [GI-53, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace PDM (Power Delivery Module). Refer to [VC-119, "Removal and Installation"](#).

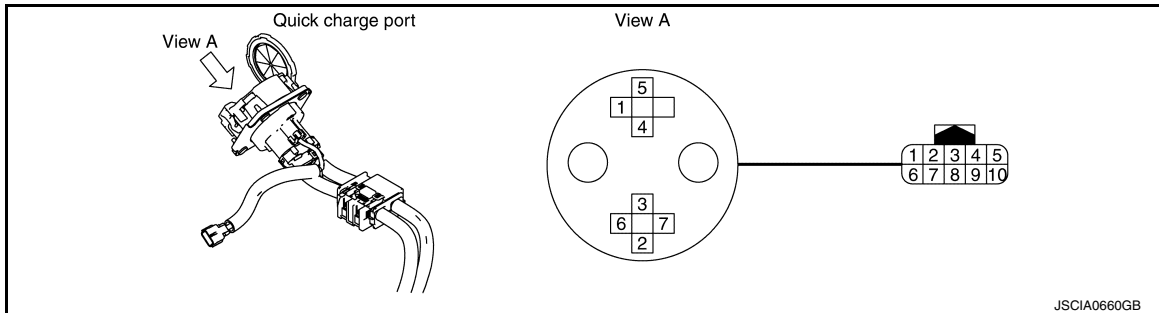
NO >> Repair or replace error-detected parts.

### Component Inspection

INFOID:000000009301066

### 1.CHECK QUICK CHARGE PORT

1. Disconnect quick charge port harness connector.
2. Check the continuity between quick charge port terminals and quick charge port side harness connector of same terminals.



Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace quick charge port. Refer to [VC-135, "Removal and Installation"](#).

### 2.CHECK QUICK CHARGE PORT TEMPERATURE SENSOR

Check the resistance between quick charge port side harness connector terminals.

Quick charge side harness connector		Condition		Resistance (kΩ)
Terminal				
5	9	Temperature [°C (°F)]	-40 – 50 (-40 – 122)	4 – 170
	10			

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace quick charge port. Refer to [VC-135, "Removal and Installation"](#).

# B2803 QUICK CHARGER

< DTC/CIRCUIT DIAGNOSIS >

## B2803 QUICK CHARGER

### DTC Logic

INFOID:000000009300081

### DTC DETECTION LOGIC

DTC	CONSULT display (Malfunction type)	DTC detection condition	Possible causes
B2803	Q/CHG PERMIT SIGNAL ERROR (Signal stuck low)	After the charge start/stop 1 signal is received from the quick charger, the quick charge connector lock signal is received from the quick charger via quick charger communication even though the charge permit signal is not being output by the PDM (Power Delivery Module).	<ul style="list-style-type: none"><li>• Harness and connector (Charge permit signal line is shorted.)</li><li>• PDM (Power Delivery Module)</li></ul>

### DTC CONFIRMATION PROCEDURE

#### 1.PERFORM DTC CONFIRMATION PROCEDURE

##### With CONSULT

1. Perform quick charge for 5 seconds or more.
2. Turn power switch ON.
3. Check "Self-diagnosis result" of "CHARGER/PD MODULE".

##### Is DTC detected?

- YES >> Proceed to [VC-75, "Diagnosis Procedure"](#).  
NO >> INSPECTION END

### Diagnosis Procedure

INFOID:000000009300082

#### 1.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

##### With CONSULT

1. Turn power switch ON.
2. Erase DTC.
3. Turn power switch OFF.
4. Perform DTC confirmation procedure again by using a quick charger other than the one is used for the previous DTC confirmation procedure. Refer to [VC-75, "DTC Logic"](#).

##### Is DTC detected?

- YES >> GO TO 2.  
NO >> INSPECTION END (Quick Charger malfunction).

#### 2.CHECK QUICK CHARGE PERMIT SIGNAL CIRCUIT (1)

##### With CONSULT

1. Turn power switch ON.
2. Select "QUICK CHARGE PERMIT" in "ACTIVE TEST" mode of "CHARGER/PD MODULE" using CONSULT.
3. Select "QUICK CHARGE PERMIT" of "DATA MONITOR" item.
4. Switch the quick charge permit signal circuit between ON and OFF to check that the "QUICK CHARGE PERMIT" indication changes.
5. Switch the quick charge permit signal circuit between ON and OFF to check that the "QUICK CHARGE PERMIT" indication changes, also change the voltage between quick charge port harness connector and ground.

Monitor item	Condition (Active test)		Indication
QUICK CHARGE PERMIT	QUICK CHARGE PERMIT	ON	LOW
		OFF	HIGH

## B2803 QUICK CHARGER

### < DTC/CIRCUIT DIAGNOSIS >

+		-	Condition (Active test)		Voltage
Quick charge port					
Connector	Terminal				
E7	4	Ground	QUICK CHARGE PERMIT	ON	1.0 V or less
				OFF	OPEN

Is the inspection result normal?

YES >> Check the intermittent incident. Refer to [GI-53, "Intermittent Incident"](#).

NO >> GO TO 3.

### 3.CHECK QUICK CHARGE PORT CONDITION

Check for any adhering foreign substances, cracking or damage on the quick charge port. Refer to [VC-59, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Clean or replace the quick charge port. Refer to [VC-135, "Removal and Installation"](#).

### 4.CHECK QUICK CHARGE PORT

Check the quick charge port. Refer to [VC-77, "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace quick charge port. Refer to [VC-135, "Removal and Installation"](#).

### 5.CHECK QUICK CHARGE PERMIT SIGNAL CIRCUIT (2)

#### With CONSULT

1. Turn power switch ON.
2. Select "QUICK CHARGE PERMIT" in "ACTIVE TEST" mode of "CHARGER/PD MODULE" using CONSULT.
3. Turn ON the quick charge permit signal circuit first. After this, turn OFF the circuit.
4. Check the continuity between quick charge port harness connector and ground.

#### CAUTION:

To ensure correct polarity of the tester, always connect the tester to the circuit in the forward direction.

+		-	Continuity
Quick charge port			
Connector	Terminal		
E7	4	Ground	Not existed

Is the inspection result normal?

YES >> Check the intermittent incident. Refer to [GI-53, "Intermittent Incident"](#).

NO >> GO TO 6.

### 6.CHECK QUICK CHARGE PERMIT SIGNAL CIRCUIT (3)

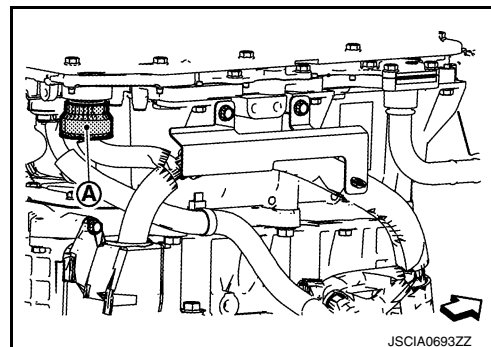
1. Turn power switch OFF.
2. Disconnect PDM (Power Delivery Module) harness connector<sup>Ⓐ</sup>.

 : Vehicle front

#### NOTE:

Loosen the PDM (Power Delivery Module) harness connector by rotating it counterclockwise and remove it.

3. Check the continuity between quick charge port harness connector and PDM (Power Delivery Module) harness connector.



# B2803 QUICK CHARGER

## < DTC/CIRCUIT DIAGNOSIS >

Quick charge port		PDM (Power Delivery Module)		Continuity
Connector	Terminal	Connector	Terminal	
E7	4	F23	19	Existed

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace error-detected parts.

## 7.CHECK INTERMITTENT INCIDENT

Check the intermittent incident. Refer to [GI-53, "Intermittent Incident"](#)

Is the inspection result normal?

YES >> Replace PDM (Power Delivery Module). Refer to [VC-119, "Removal and Installation"](#).

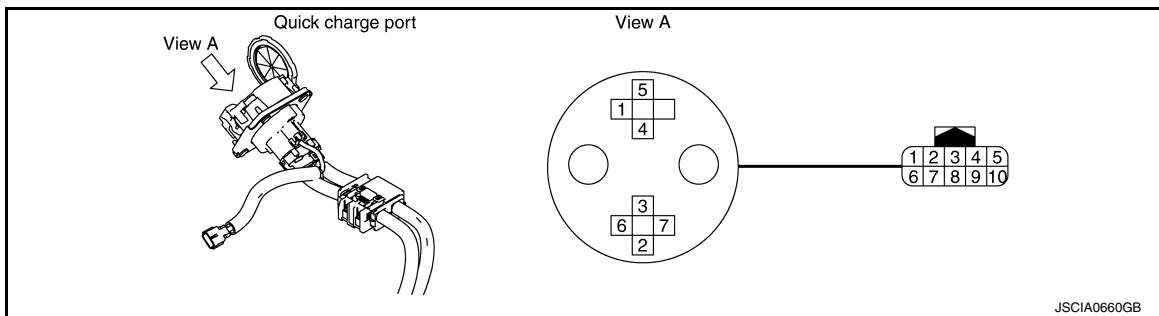
NO >> Repair or replace error-detected parts.

## Component Inspection

INFOID:000000009301067

## 1.CHECK QUICK CHARGE PORT

1. Disconnect quick charge port harness connector.
2. Check the continuity between quick charge port terminals and quick charge port side harness connector of same terminals.



Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace quick charge port. Refer to [VC-135, "Removal and Installation"](#).

## 2.CHECK QUICK CHARGE PORT TEMPERATURE SENSOR

Check the resistance between quick charge port side harness connector terminals.

Quick charge side harness connector		Condition		Resistance (kΩ)
Terminal				
5	9	Temperature [°C (°F)]	-40 – 50 (-40 – 122)	4 – 170
	10			

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace quick charge port. Refer to [VC-135, "Removal and Installation"](#).

## B2814 QUICK CHARGE RELAY

< DTC/CIRCUIT DIAGNOSIS >

### B2814 QUICK CHARGE RELAY

#### DTC Logic

INFOID:000000009300084

#### DTC DETECTION LOGIC

DTC	CONSULT display (Malfunction type)	DTC detection condition	Possible causes
B2814	QUICK CHARGE RELAY (Signal stuck high)	<ul style="list-style-type: none"><li>When the quick charge relay is ON, the terminal voltage in the quick charge relay drive circuit is 4.69 V or more continually for 3 seconds or more.</li><li>When the quick charge relay is ON, the high voltage circuit voltage that is input from the quick charge sensor is 60 V or more continually for 1 second or more.</li></ul>	<ul style="list-style-type: none"><li>Harness and connector [PDM (Power Delivery Module) ground circuit is open.]</li><li>PDM (Power Delivery Module)</li></ul>

#### DTC CONFIRMATION PROCEDURE

##### 1.PERFORM DTC CONFIRMATION PROCEDURE

###### With CONSULT

- Perform quick charging for 10 seconds or more.
- Turn power switch ON.
- Check "Self-diagnosis result" of "CHARGER/PD MODULE".

###### Is DTC detected?

YES >> Proceed to [VC-78. "Diagnosis Procedure"](#).  
NO >> INSPECTION END

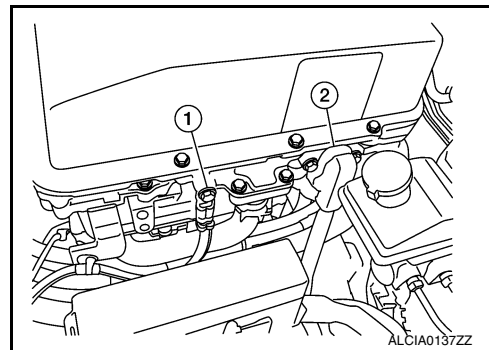
#### Diagnosis Procedure

INFOID:000000009300085

##### 1.CHECK 12V BATTERY NEGATIVE CABLE ON PDM (POWER DELIVERY MODULE) SIDE (1)

- Turn power switch OFF.
- Check the installation of 12V battery negative cable on PDM (Power Delivery Module) side①.

② : 12V battery positive cable



###### Is the inspection result normal?

YES >> GO TO 2.  
NO >> Repair or replace 12V battery negative cable on PDM (Power Delivery Module) side connection.

##### 2.CHECK 12V BATTERY NEGATIVE CABLE ON PDM (POWER DELIVERY MODULE) SIDE (2)

Check the continuity between 12V battery negative cable on PDM (Power Delivery Module) side and ground.

+		-	Continuity
PDM (Power Delivery Module)			
Connector	Terminal		
F32	51	Ground	Existed

###### Is the inspection result normal?

## B2814 QUICK CHARGE RELAY

### < DTC/CIRCUIT DIAGNOSIS >

---

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

### 3.CHECK INTERMITTENT INCIDENT

---

Check the intermittent incident. Refer to [GI-53, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace PDM (Power Delivery Module). Refer to [VC-119, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

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## B2820 QUICK CHARGER

< DTC/CIRCUIT DIAGNOSIS >

### B2820 QUICK CHARGER

#### DTC Logic

INFOID:000000009300086

#### DTC DETECTION LOGIC

DTC	CONSULT display (Malfunction type)	DTC detection condition	Possible causes
B2820	QUICK CHARGER ( — )	<ul style="list-style-type: none"><li>• The quick charger malfunction signal is received from the quick charger.</li><li>• The voltage detected by the quick charger is excessively higher or lower than the voltage detected by the Li-ion battery controller.</li><li>• The current output from the quick charger is excessively higher or lower than the command current.</li><li>• The current supplied to the PCS is excessively higher or lower than the current upper limit reading indicated by the vehicle.</li></ul>	<ul style="list-style-type: none"><li>• Quick charger</li><li>• Li-ion battery controller (Voltage sensor system)</li></ul>

#### DTC CONFIRMATION PROCEDURE

##### 1.PERFORM DTC CONFIRMATION PROCEDURE

###### With CONSULT

1. Perform quick charging for 10 seconds or more.
2. Turn power switch ON.
3. Check "Self-diagnosis result" of "CHARGER/PD MODULE".

###### Is DTC detected?

- YES >> Proceed to [VC-80. "Diagnosis Procedure"](#).  
NO >> INSPECTION END

#### Diagnosis Procedure

INFOID:000000009300087

##### 1.PERFORM SELF-DIAGNOSIS OF LI-ION BATTERY CONTROLLER

###### With CONSULT

Perform self-diagnosis for "HV BAT".

###### Is any DTC detected?

- YES >> Perform trouble diagnosis for detected DTC. Refer to [EVB-45. "DTC Index"](#).  
NO >> When this DTC detected, the cause may not be in the vehicle. Therefore after erasing the self-diagnosis result, charge using a different quick charger than the quick charger which is used when the malfunction is detected.



# B2830 QUICK CHARGE VOLTAGE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

## B2830 QUICK CHARGE VOLTAGE SENSOR

### Description

INFOID:000000009300088

The quick charge voltage sensor is integrated inside the PDM (Power Delivery Module), and detects the voltage at the + side and – side of the high voltage circuit on the upstream side of the quick charge relay (quick charge port side). The PDM (Power Delivery Module) monitors the status of the quick charge relay based on this signal.

### DTC Logic

INFOID:000000009300089

### DTC DETECTION LOGIC

#### CAUTION:

**This DTC may be detected when there is a quick charger malfunction. Therefore if this DTC is detected, check that there are no malfunctions in the quick charger.**

DTC	CONSULT display (Malfunction type)	DTC detection condition	Possible causes
B2830	QUICK CHARGE VOLT- AGE SENSOR (Component internal mal- function)	<ul style="list-style-type: none"><li>• Before the start of quick charge, the high voltage circuit voltage that is sent from the quick charge voltage sensor during charging is 60 V or more continuously for 0.3 seconds or more.</li><li>• During quick charging, the high voltage circuit voltage that is sent from the quick charge voltage sensor is less than 60 V continuously for 10 seconds or more.</li><li>• Before the start of quick charging, the high voltage circuit voltage sent from the quick charge voltage sensor is 60 V or more continuously for 1 second or more when the main relay is OFF.</li><li>• After the start of quick charging, the high voltage circuit voltage sent from the quick charge voltage sensor is 30 V or more continuously for 1 second or more during the insulation check by the quick charger.</li></ul>	<ul style="list-style-type: none"><li>• PDM (Power Delivery Mod- ule)</li><li>• Quick charger</li></ul>

### DTC CONFIRMATION PROCEDURE

#### 1.PERFORM DTC CONFIRMATION PROCEDURE

##### With CONSULT

1. Perform quick charging for 30 seconds or more.
2. Turn power switch ON.
3. Check "Self-diagnosis result" of "CHARGER/PD MODULE".

##### Is DTC detected?

- YES >> Proceed to [VC-81, "Diagnosis Procedure"](#).  
NO >> INSPECTION END

### Diagnosis Procedure

INFOID:000000009300090

#### 1.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

##### With CONSULT

1. Turn power switch ON.
2. Erase DTC.
3. Turn power switch OFF.
4. Perform DTC confirmation procedure again by using a quick charger other than the one is used for the previous DTC confirmation procedure. Refer to [VC-81, "DTC Logic"](#).

##### Is the DTC detected again?

- YES >> GO TO 2.  
NO >> INSPECTION END (Quick Charger malfunction).

#### 2.CHECK INTERMITTENT INCIDENT

Check the intermittent incident. Refer to [GI-53, "Intermittent Incident"](#).

## B2830 QUICK CHARGE VOLTAGE SENSOR

### < DTC/CIRCUIT DIAGNOSIS >

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#### Is the inspection result normal?

- YES >> Replace PDM (Power Delivery Module). Refer to [VC-119, "Removal and Installation"](#).
- NO >> Repair or replace error-detected parts.

## B2840 PDM(POWER DELIVERY MODULE)

< DTC/CIRCUIT DIAGNOSIS >

### B2840 PDM(POWER DELIVERY MODULE)

#### DTC Logic

INFOID:000000009300091

#### DTC DETECTION LOGIC

##### CAUTION:

- Never use an extension cable or similar item during charging.
- For charging with AC100 V, use an independent socket with 15 A or higher rating. For charging with AC200 V, use an independent 20 A or higher socket.

##### NOTE:

- DTC B2840 may be detected when an extension cable is used when charging using the EVSE.
- DTC B2840 may be detected when an independent socket of 15 A or higher (AC100 V charging), or 20 A or higher (AC200 V charging), is not used.

A

B

VC

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## B2840 PDM(POWER DELIVERY MODULE)

< DTC/CIRCUIT DIAGNOSIS >

DTC	CONSULT display (Malfunction type)	DTC detection condition	Possible causes
B2840	A  PDM (POWER DELIVERY MODULE) (Electrical malfunction)	<ul style="list-style-type: none"> <li>During normal charging, PFC output voltage inside the PDM (Power Delivery Module) is 436.8 V or more, or less than 329 V, continually for 0.2 seconds or more, five or more times.</li> <li>During normal charging, output voltage inside the PDM (Power Delivery Module) is 450 V or more continuously for 1 second or more, five or more times, or recovery from charge interrupt does not occur for 60 seconds or more after output voltage of 450 V or more occurs.</li> <li>During normal charging, output voltage inside the PDM (Power Delivery Module) is less than 170 V continuously for 1 second or more, five or more times, or recovery from charge interrupt does not occur for 60 seconds or more after output voltage of less than 170 V occurs.</li> </ul>	
	B  PDM (POWER DELIVERY MODULE) (Component internal malfunction)	<ul style="list-style-type: none"> <li>Before the start of normal or quick charging, during quick charging, or during driving, AC input voltage for the PDM (Power Delivery Module) is 60 V or more continuously for 10 seconds or more.</li> <li>During normal charging, AC input current to the PDM (Power Delivery Module) is 32 A or more continuously for 0.2 seconds or more, 20 or more times, or recovery from charge interrupt does not occur for 60 seconds or more after input current of 32 A or higher occurs.</li> <li>Before the start of normal or quick charging, during quick charging, or during driving, output current from the master power converter inside the PDM (Power Delivery Module) is 5 A or higher continuously for 10 seconds or more.</li> <li>An I2C communications malfunction occurs in the PDM (Power Delivery Module).</li> <li>During normal charging, DC voltage output by the PDM (Power Delivery Module) is 440 V or more, or 240 V or less, continuously for 5 seconds or more.</li> <li>During normal charging, output current from the master power converter inside the PDM (Power Delivery Module) is <math>\pm 20\%</math> or more than the command current value continuously for 60 seconds or more. (Models for 6.0 kw)</li> <li>During normal charging, output current from the master power converter inside the PDM (Power Delivery Module) is <math>\pm 50\%</math> or more than the command current value continuously for 30 seconds or more. (Models for 6.0 kw)</li> <li>Before the start of normal or quick charging, during quick charging, or during driving, output current from the slave power converter inside the PDM (Power Delivery Module) is 5 A or higher continuously for 10 seconds or more. (Models for 6.0 kw)</li> <li>During normal charging, output current from the slave power converter inside the PDM (Power Delivery Module) is <math>\pm 20\%</math> or more than the master current value continuously for 60 seconds or more. (Models for 6.0 kw)</li> <li>During normal charging, output current from the slave power converter inside the PDM (Power Delivery Module) is <math>\pm 50\%</math> or more than the master current value continuously for 30 seconds or more. (Models for 6.0 kw)</li> </ul>	<ul style="list-style-type: none"> <li>Harness and connector</li> <li>PDM (Power Delivery Module)</li> </ul>
	C  PDM (POWER DELIVERY MODULE) (Component or system over temperature)	During normal charging, the temperature of the circuits inside the PDM (Power Delivery Module) are excessively high continuously for 30 seconds or more.	<ul style="list-style-type: none"> <li>High voltage cooling system</li> <li>Engine coolant level</li> <li>PDM (Power Delivery Module)</li> </ul>

### DTC CONFIRMATION PROCEDURE

#### 1.PERFORM DTC CONFIRMATION PROCEDURE

## B2840 PDM(POWER DELIVERY MODULE)

### < DTC/CIRCUIT DIAGNOSIS >

#### With CONSULT

1. Perform normal charging for 120 seconds or more.
2. Turn power switch ON.
3. Check "Self-diagnosis result" of "CHARGER/PD MODULE".

#### Is DTC detected?

YES (TYPE A or B)>>Proceed to [VC-85, "TYPE A AND B : Diagnosis Procedure"](#).

YES (TYPE C)>>Proceed to [VC-86, "TYPE C : Diagnosis Procedure"](#).

NO >> INSPECTION END

### TYPE A AND B

#### TYPE A AND B : Diagnosis Procedure

INFOID:000000009300092

#### **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 [VC-6, "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.

#### 1. CHECK PDM (POWER DELIVERY MODULE) HIGH-VOLTAGE HARNESS CONNECTION

1. Turn power switch OFF.
2. Remove PDM (Power Delivery Module) from the vehicle. Refer to [VC-119, "Removal and Installation"](#).
3. Check the connection of each high-voltage harness on the PDM (Power Delivery Module) side for looseness and damage.

#### Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

#### 2. CHECK PDM (POWER DELIVERY MODULE) HIGH-VOLTAGE HARNESS

1. Remove each high-voltage harness from PDM (Power Delivery Module). Refer to [VC-126, "Disassembly and Assembly"](#).
2. Check the continuity of the following high-voltage harness.

Li-ion battery high-voltage harness

PDM (Power Delivery Module)		Li-ion battery		Continuity
Connector	Terminal	Connector	Terminal	
H5	38	H3	37	Existed
	39		38	
	40		39	

## B2840 PDM(POWER DELIVERY MODULE)

### < DTC/CIRCUIT DIAGNOSIS >

Electric compressor harness (with heat pump)

PDM (Power Delivery Module)		Electric compressor		Continuity
Connector	Terminal	Connector	Terminal	
H6	41	H25	2	Existed
	42		1	
	43		3	

Electric compressor harness (without heat pump)

PDM (Power Delivery Module)		Electric compressor		Continuity
Connector	Terminal	Connector	Terminal	
H7	41	H1	1	Existed
	42		3	
	43		2	
	44		4	

Quick charge port

PDM (Power Delivery Module)		Quick charge port		Continuity
Connector	Terminal	Connector	Terminal	
H8	45	H10	11	Existed
	46		12	

Normal charge port

PDM (Power Delivery Module)		Normal charge port		Continuity
Connector	Terminal	Connector	Terminal	
H9	47	H11	3	Existed
	48		4	

Is the inspection result normal?

YES >> Replace PDM (Power Delivery Module). Refer to [VC-119, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

### TYPE C

### TYPE C : Diagnosis Procedure

INFOID:000000009300093

#### 1.CHECK HIGH VOLTAGE COOLING SYSTEM

Inspect coolant level and leakage of high voltage cooling system. Refer to [HCO-11, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

#### 2.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

##### With CONSULT

1. Turn power switch ON.
2. Erase DTC.
3. Turn power switch OFF.
4. Perform DTC confirmation procedure again. Refer to [VC-83, "DTC Logic"](#).

Is the DTC detected again?

YES >> Replace PDM (Power Delivery Module). Refer to [VC-119, "Removal and Installation"](#).

NO >> INSPECTION END

## B2850 PDM(POWER DELIVERY MODULE)

< DTC/CIRCUIT DIAGNOSIS >

### B2850 PDM(POWER DELIVERY MODULE)

#### Description

INFOID:0000000009300094

Two temperature sensors are integrated in the PDM (Power Delivery Module), and monitor the charging circuit temperature and control circuit board temperature.

The PDM (Power Delivery Module) also detects sensor accuracy malfunctions by comparing the signals from each sensor.

#### DTC Logic

INFOID:0000000009300095

#### DTC DETECTION LOGIC

DTC	CONSULT display (Malfunction type)	DTC detection condition	Possible causes
B2850	PD MODULE TEMP SEN (Signal stuck low)	During normal charging, the signal voltage of the temperature sensor inside the PDM (Power Delivery Module) is excessively low continuously for 30 seconds or more.	PDM (Power Delivery Module)

#### DTC CONFIRMATION PROCEDURE

##### 1.PERFORM DTC CONFIRMATION PROCEDURE

###### With CONSULT

1. Perform normal charging for 30 seconds or more.
2. Turn power switch ON.
3. Check "Self-diagnosis result" of "CHARGER/PD MODULE".

###### Is DTC detected?

- YES >> Proceed to [VC-87, "Diagnosis Procedure"](#).  
NO >> INSPECTION END

#### Diagnosis Procedure

INFOID:0000000009300096

##### 1.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

###### With CONSULT

1. Turn power switch ON.
2. Erase DTC.
3. Turn power switch OFF.
4. Perform DTC confirmation procedure again. Refer to [VC-87, "DTC Logic"](#).

###### Is the DTC detected again?

- YES >> Replace PDM (Power Delivery Module). Refer to [VC-119, "Removal and Installation"](#).  
NO >> INSPECTION END

## B2880 F/S CHG RELAY

< DTC/CIRCUIT DIAGNOSIS >

### B2880 F/S CHG RELAY

#### DTC Logic

INFOID:000000009300097

#### DTC DETECTION LOGIC

DTC	CONSULT display (Malfunction type)		DTC detection condition	Possible causes
B2880	A	F/S CHARGE RELAY (Signal stuck low)	During quick charging, the voltage of the quick charge relay control circuit is less than approximately 4.21 V continuously for 3 seconds.	<ul style="list-style-type: none"><li>• Harness and connector</li><li>• Quick charge relay</li><li>• PDM (Power Delivery Module)</li><li>• F/S CHG relay</li><li>• F/S relay</li></ul>
	B	F/S CHARGE RELAY (Signal stuck high)	During quick charging, the voltage of the quick charge relay control circuit is 4.69 V or more continuously for 3 seconds.	<ul style="list-style-type: none"><li>• Harness and connector</li><li>• PDM (Power Delivery Module)</li><li>• F/S CHG relay</li><li>• F/S relay</li></ul>

#### DTC CONFIRMATION PROCEDURE

##### 1.PERFORM DTC CONFIRMATION PROCEDURE

###### With CONSULT

1. Perform quick charging for 15 seconds or more.
2. Turn power switch ON.
3. Check self-diagnosis results.

###### Is DTC detected?

YES (TYPE A)>>Proceed to [VC-88, "TYPE A : Diagnosis Procedure"](#).

YES (TYPE B)>>Proceed to [VC-90, "TYPE B : Diagnosis Procedure"](#).

NO >> INSPECTION END

#### TYPE A

#### TYPE A : Diagnosis Procedure

INFOID:000000009300098

##### 1.CHECK QUICK CHARGE RELAY OPERATION

###### With CONSULT

1. Turn power switch ON.
2. Select "Q/CHG RELAY +" in "ACTIVE TEST" mode of "CHARGER/PD MODULE" using CONSULT.
3. Switch the quick charge relay between ON and OFF to check operating noise.

###### **NOTE:**

If operating noise is hard to hear, use a sound scope to check noise.

4. Check "Q/CHG RELAY -" in same manner.

###### Can operating sound be heard?

YES >> GO TO 2.

NO >> GO TO 3.

##### 2.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

###### With CONSULT

1. Erase DTC.
2. Turn power switch OFF.
3. Perform DTC confirmation procedure again. Refer to [VC-88, "DTC Logic"](#).

###### Is the DTC detected again?

YES >> Replace PDM (Power delivery module). Refer to [VC-119, "Removal and Installation"](#).

NO >> INSPECTION END

##### 3.CHECK F/S CHG RELAY OPERATION

###### With CONSULT

1. Select "F/S CHG RLY" in "ACTIVE TEST" mode of "EV/HEV" using CONSULT.
2. Switch the F/S CHG relay between ON and OFF to check operating noise of the F/S CHG relay.



## B2880 F/S CHG RELAY

### < DTC/CIRCUIT DIAGNOSIS >

#### Can operating sound be heard?

YES >> GO TO 4.

NO >> Perform the trouble diagnosis for F/S CHG relay system. Refer to [EVC-376. "Diagnosis Procedure"](#).

### 4. CHECK F/S CHG RELAY SIGNAL

#### With CONSULT

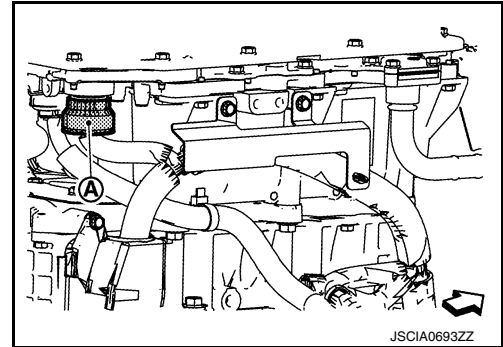
1. Turn power switch OFF.
2. Disconnect PDM (Power Delivery Module) harness connector(A).

 : Vehicle front

#### NOTE:

Loosen the PDM (Power Delivery Module) harness connector by rotating it counterclockwise and remove it.

3. Turn power switch ON.
4. Select "F/S CHG RLY" in "ACTIVE TEST" mode of "EV/HEV" using CONSULT.
5. Turn ON the F/S CHG relay.
6. Check the voltage between PDM (Power Delivery Module) harness connector and ground.



+		-	Voltage
PDM (Power Delivery Module)			
Connector	Terminal		
F23	9	Ground	12V battery voltage

#### Is the inspection result normal?

YES >> Replace PDM (Power Delivery Module). Refer to [VC-119. "Removal and Installation"](#).

NO >> GO TO 5

### 5. CHECK F/S CHG RELAY SIGNAL CIRCUIT

1. Turn power switch OFF.
2. Remove F/S CHG relay.
3. Check the continuity between PDM (Power Delivery Module) harness connector and F/S CHG relay harness connector.

PDM (Power Delivery Module)		F/S CHG relay		Continuity
Connector	Terminal	Connector	Terminal	
F23	9	E64	5	Existed

#### Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

### 6. CHECK 12V BATTERY POWER SUPPLY (1)

Check the voltage between F/S CHG relay harness connector and ground.

+		-	Voltage
F/S CHG relay			
Connector	Terminal		
E64	3	Ground	12V battery voltage

#### Is the inspection result normal?

## B2880 F/S CHG RELAY

### < DTC/CIRCUIT DIAGNOSIS >

- YES >> Replace F/S CHG relay.  
NO >> GO TO 7.

### 7.CHECK FUSE

Check that the following fuse is not fusing.

Fuse No.	Capacity
#33	10 A

#### Is the fuse fusing?

- YES >> Replace the fuse after repairing the applicable circuit.  
NO >> GO TO 8.

### 8.CHECK 12V BATTERY POWER SUPPLY (2)

1. Pull out #33 fuse.
2. Check the voltage between fuse terminal and ground.

+	-	Voltage
#33 fuse terminal	Ground	12V battery voltage

#### Is the inspection result normal?

- YES >> GO TO 9.  
NO >> Perform the trouble diagnosis for 12V battery power supply circuit.

### 9.CHECK 12V BATTERY POWER SUPPLY CIRCUIT

Check the continuity between F/S CHG relay harness connector and fuse terminal.

+		-	Continuity
F/S CHG relay			
Connector	Terminal		
E64	3	#33 fuse terminal	Existed

#### Is the inspection result normal?

- YES >> Check the intermittent incident. Refer to [GI-53, "Intermittent Incident"](#).  
NO >> Repair or replace error-detected parts

### TYPE B

### TYPE B : Diagnosis Procedure

INFOID:000000009300099

### 1.CHECK F/S CHG RELAY SIGNAL CIRCUIT

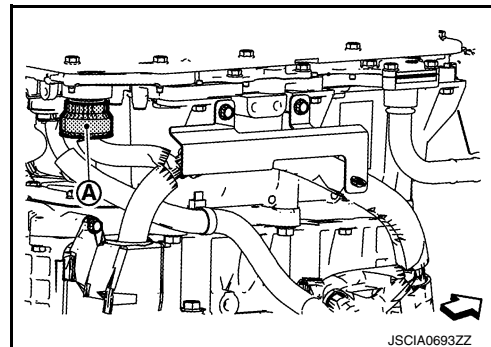
1. Turn power switch OFF.
2. Disconnect PDM (Power Delivery Module) harness connectorⒶ.

↩ : Vehicle front

#### NOTE:

Loosen the PDM (Power Delivery Module) harness connector by rotating it counterclockwise and remove it.

3. Turn power switch ON.
4. Check the voltage between PDM (Power Delivery Module) harness connector and ground.



## B2880 F/S CHG RELAY

### < DTC/CIRCUIT DIAGNOSIS >

+		-	Voltage (Approx.)
PDM (Power Delivery Module)			
Connector	Terminal		
F23	9	Ground	0 V

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

### 2.CHECK F/S CHG RELAY POWER SUPPLY

1. Turn power switch OFF.
2. Remove F/S CHG relay.
3. Turn power switch ON.
4. Check the voltage between PDM (Power Delivery Module) harness connector and ground.

+		-	Voltage (Approx.)
PDM (Power Delivery Module)			
Connector	Terminal		
F23	9	Ground	0 V

Is the inspection result normal?

YES >> Perform the trouble diagnosis for F/S CHG relay system. Refer to [EVC-376, "Diagnosis Procedure"](#).

NO >> There may be a short circuit in the location between power and an area between F/S CHG relay harness connector and PDM (Power Delivery Module) harness connector. Check the harness for short circuit.

### 3.CHECK INTERMITTENT INCIDENT

Check the intermittent incident. Refer to [GI-53, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace PDM (Power Delivery Module). Refer to [VC-119, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

# B2890 DC/DC CONVERTER

< DTC/CIRCUIT DIAGNOSIS >

## B2890 DC/DC CONVERTER

### DTC Logic

INFOID:000000009300100

### DTC DETECTION LOGIC

DTC	CONSULT display (Malfunction type)		DTC detection condition	Possible causes
B2890	A	DC/DC CONVERTER (Circuit voltage below threshold)	During quick or normal charging, or during driving, the 12 V DC/DC converter inside the PDM (Power Delivery Module) outputs an excessively low voltage continuously for 3 seconds or more, or output, an excessively low voltage for less than 3 seconds, 20 times.	<ul style="list-style-type: none"><li>• 12V battery</li><li>• Harness and connector</li><li>• PDM (Power Delivery Module)</li></ul>
	B	DC/DC CONVERTER (Electrical malfunction)	During quick or normal charging, or during driving, an irregular voltage is input into the 12 V DC/DC converter inside the PDM (Power Delivery Module) continuously for 3 seconds or more, or is input continuously for less than 3 seconds, 20 times.	<ul style="list-style-type: none"><li>• Harness and connector</li><li>• PDM (Power Delivery Module)</li></ul>
	C	DC/DC CONVERTER (Component internal malfunction)	An I2C communication malfunction (12 V DC/DC control section) occurs.	PDM (Power Delivery Module)
	D	DC/DC CONVERTER (Component or system over temperature)	During quick or normal charging, or during driving, the temperature of the 12 V DC/DC converter inside the PDM (Power Delivery Module) is excessively high continuously for 3 seconds or more, or is excessively high continuously for less than 3 seconds, 20 times.	<ul style="list-style-type: none"><li>• High voltage cooling system</li><li>- Cooling fan (VCM)</li><li>- Engine coolant level</li><li>• PDM (Power Delivery Module)</li></ul>
	E	DC/DC CONVERTER (Circuit volt above threshold)	When the output voltage of the 12 V DC/DC converter mounted inside PDM (Power Delivery Module) is extremely high during quick/normal charge or driving.	<ul style="list-style-type: none"><li>• 12V battery</li><li>• Harness and connector</li><li>• PDM (Power Delivery Module)</li></ul>

### DTC CONFIRMATION PROCEDURE

#### 1.PERFORM DTC CONFIRMATION PROCEDURE

##### With CONSULT

1. Set the vehicle to READY and wait 120 seconds or more.
2. Check "Self-diagnosis result" of "CHARGER/PD MODULE".

##### Is DTC detected?

YES (TYPE A)>>Proceed to [VC-92, "TYPE A AND E : Diagnosis Procedure"](#).  
YES (TYPE B)>>Proceed to [VC-93, "TYPE B : Diagnosis Procedure"](#).  
YES (TYPE C)>>Proceed to [VC-94, "TYPE C : Diagnosis Procedure"](#).  
YES (TYPE D)>>Proceed to [VC-94, "TYPE D : Diagnosis Procedure"](#).  
YES (TYPE E)>>Proceed to [VC-92, "TYPE A AND E : Diagnosis Procedure"](#).  
NO >> INSPECTION END

#### TYPE A AND E

#### TYPE A AND E : Diagnosis Procedure

INFOID:000000009300101

#### 1.CHECK 12V BATTERY

Check the 12V battery. Refer to [PG-59, "How to Handle 12V Battery"](#).

##### Is the inspection result normal?

YES >> GO TO 2.  
NO >> Replace 12V battery. Refer to [PG-65, "Removal and Installation"](#).

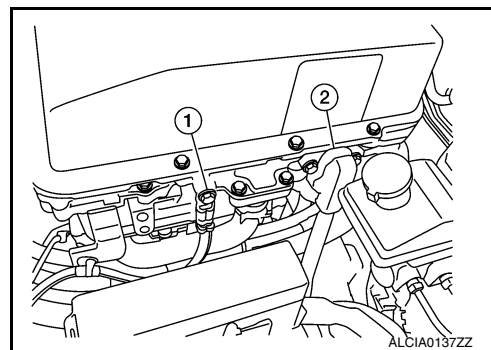
#### 2.CHECK 12V BATTERY CABLE ON PDM (POWER DELIVERY MODULE) SIDE (1)

1. Turn power switch OFF.

## B2890 DC/DC CONVERTER

### < DTC/CIRCUIT DIAGNOSIS >

2. Check the installation of 12V battery negative cable① and 12V battery positive cable②. [PDM (Power Delivery Module) side.]



Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace 12V battery negative cable or positive cable on PDM (Power Delivery Module) side connection.

### 3.CHECK 12V BATTERY CABLE ON PDM (POWER DELIVERY MODULE) SIDE (2)

1. Disconnect 12V battery negative and positive terminal. Refer to [VC-5, "Precautions for Removing of Battery Terminal"](#).
2. Remove 12V battery negative and positive cable on PDM (Power Delivery Module) side.
3. Check the continuity between 12V battery negative cable terminal on PDM (Power Delivery Module) side and 12V battery negative terminal, between 12V battery positive cable terminal on PDM (Power Delivery Module) side and 12V battery positive terminal.

+		-	Continuity
PDM (Power Delivery Module) side		12V battery side	
Connector	Terminal		
F32	51	12V battery negative terminal	Existed
E201	37	12V battery positive terminal	

Is the inspection result normal?

YES >> Replace PDM (Power Delivery Module). Refer to [VC-119, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

### TYPE B

### TYPE B : Diagnosis Procedure

INFOID:0000000009300102

#### **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 [VC-6, "High Voltage Precautions"](#).

## B2890 DC/DC CONVERTER

### < DTC/CIRCUIT DIAGNOSIS >

#### 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.

#### 1.CHECK LI-ION BATTERY HIGH-VOLTAGE HARNESS

1. Remove PDM (Power Delivery Module) from the vehicle. Refer to [VC-119, "Removal and Installation"](#).
2. Remove Li-ion battery high-voltage harness from PDM (Power Delivery Module). Refer to [VC-126, "Dis-assembly and Assembly"](#).
3. Check the continuity of Li-ion battery high-voltage harness.

PDM (Power Delivery Module)		Li-ion battery		Continuity
Connector	Terminal	Connector	Terminal	
H5	38	H3	37	Existed
	39		38	

Is the inspection result normal?

YES >> Replace PDM (Power Delivery Module). Refer to [VC-119, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

#### TYPE C

#### TYPE C : Diagnosis Procedure

INFOID:000000009300103

#### 1.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

##### With CONSULT

1. Erase DTC.
2. Turn power switch OFF.
3. Perform DTC confirmation procedure again. Refer to [VC-92, "DTC Logic"](#).

Is the DTC detected again?

YES >> Replace PDM (Power Delivery Module). Refer to [VC-119, "Removal and Installation"](#).

NO >> INSPECTION END

#### TYPE D

#### TYPE D : Diagnosis Procedure

INFOID:000000009300104

#### 1.CHECK COOLING FAN

Check the cooling fan. Refer to [EVC-370, "Component Function Check"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

#### 2.CHECK HIGH VOLTAGE COOLING SYSTEM

Inspect coolant level and leakage of high voltage cooling system. Refer to [HCO-11, "Inspection"](#).

Is the inspection result normal?

YES >> Replace PDM (Power Delivery Module). Refer to [VC-119, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

# B2900, B2902 PDM(POWER DELIVERY MODULE)

< DTC/CIRCUIT DIAGNOSIS >

## B2900, B2902 PDM(POWER DELIVERY MODULE)

### DTC Logic

INFOID:000000009300105

### DTC DETECTION LOGIC

DTC	CONSULT display (Malfunction type)	DTC detection condition	Possible causes
B2900	PDM (POWER DELIVERY MODULE) (Program memory error)	PDM (Power Delivery Module) internal ROM malfunction	PDM (Power Delivery Module)
	PDM (POWER DELIVERY MODULE) (Data memory error)	PDM (Power Delivery Module) internal RAM malfunction	
B2902	PDM (POWER DELIVERY MODULE) (Memory error)	<ul style="list-style-type: none"><li>• PDM (Power Delivery Module) internal EEPROM malfunction</li><li>• I2C communication malfunction (EEPROM control section)</li></ul>	
	PDM (POWER DELIVERY MODULE) (Component internal malfunction)	I2C communication malfunction (EEPROM control section)	

### DTC CONFIRMATION PROCEDURE

#### 1.PERFORM DTC CONFIRMATION PROCEDURE

##### With CONSULT

1. Turn power switch ON and wait for 5 seconds or more.
2. Check "Self-diagnosis result" of "CHARGER/PD MODULE".

##### Is DTC detected?

- YES >> Proceed to [VC-95, "Diagnosis Procedure"](#).  
NO >> INSPECTION END

### Diagnosis Procedure

INFOID:000000009300106

#### 1.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

##### With CONSULT

1. Erase DTC.
2. Turn power switch OFF.
3. Perform DTC confirmation procedure again. Refer to [VC-95, "DTC Logic"](#).

##### Is the DTC detected again?

- YES >> Replace PDM (Power Delivery Module). Refer to [VC-119, "Removal and Installation"](#).  
NO >> INSPECTION END

## B2980 QUICK CHARGE PORT

< DTC/CIRCUIT DIAGNOSIS >

### B2980 QUICK CHARGE PORT

#### Description

INFOID:000000009300107

The quick charge port contains a temperature sensor, and the quick charge port temperature signals is sent as two lines of voltage to the PDM (Power Delivery Module).

#### DTC Logic

INFOID:000000009300108

#### DTC DETECTION LOGIC

DTC	CONSULT display (Malfunction type)	DTC detection condition	Possible causes
B2980	QUICK CHARGE PORT TEMP (Signal stuck high)	<ul style="list-style-type: none"><li>During quick charging, the signal voltage of the quick charge port temperature sensor is 4.85 V or more continuously for 3 seconds or more.</li><li>During quick charging, the signal voltage of the quick charge port temperature sensor is less than 0.15 V continuously for 3 seconds or more.</li></ul>	<ul style="list-style-type: none"><li>Harness and connector (Quick charge port circuit is open or shorted.)</li><li>Quick charge port</li><li>Quick charger (connector)</li></ul>
	QUICK CHARGE PORT TEMP (Component or system over temperature)	During quick charging, the quick charge port temperature is 90°C or more continuously for 3 seconds or more.	

#### DTC CONFIRMATION PROCEDURE

##### 1.PERFORM DTC CONFIRMATION PROCEDURE

###### With CONSULT

- Perform quick charging for 10 seconds or more.
- Turn power switch ON.
- Check "Self-diagnosis result" of "CHARGER/PD MODULE".

###### Is DTC detected?

YES >> Proceed to [VC-96, "Diagnosis Procedure"](#).

NO >> INSPECTION END

#### Diagnosis Procedure

INFOID:000000009300109

##### 1.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

###### With CONSULT

- Turn power switch ON.
- Erase DTC.
- Turn power switch OFF.
- Perform DTC confirmation procedure again by using a quick charger other than the one is used for the previous DTC confirmation procedure. Refer to [VC-96, "DTC Logic"](#).

###### Is the DTC detected again?

YES >> GO TO 2.

NO >> INSPECTION END (Quick Charger malfunction)

##### 2.CHECK QUICK CHARGE PORT CONDITION

Check for any adhering foreign substances, cracking or damage on the quick charge port. Refer to [VC-59, "Inspection"](#).

###### Is the inspection result normal?

YES >> GO TO 3.

NO >> Clean or replace the quick charge port. Refer to [VC-135, "Removal and Installation"](#).

##### 3.CHECK QUICK CHARGE PORT HARNESS CONNECTOR

- Turn power switch OFF.



## B2980 QUICK CHARGE PORT

### < DTC/CIRCUIT DIAGNOSIS >

2. Disconnect quick charge port harness connector.
3. Check quick charge port harness connector. (E7). Refer to [GI-50, "How to Check Terminal"](#).
4. Check contact pressure of quick charge port harness connector (E7). Refer to [GI-50, "How to Check Terminal"](#).
5. Check the waterproof condition of quick charge port harness connector (E7). Refer to [GI-50, "How to Check Terminal"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

### 4.CHECK QUICK CHARGE PORT

Check the quick charge port. Refer to [VC-98, "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace quick charge port. Refer to [VC-135, "Removal and Installation"](#).

### 5.CHECK QUICK CHARGE PORT TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

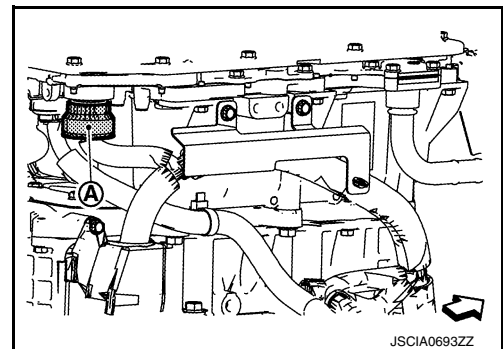
1. Disconnect PDM (Power Delivery Module) harness connectorⒶ.

← : Vehicle front

#### NOTE:

Loosen the PDM (Power Delivery Module) harness connector by rotating it counterclockwise and remove it.

2. Check the continuity between PDM (Power Delivery Module) harness connector and quick charge port harness connector.



PDM (Power Delivery Module)		Quick charge port		Continuity
Connector	Terminal	Connector	Terminal	
F23	26	E7	9	Existed
	25		10	

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

### 6.CHECK QUICK CHARGE PORT TEMPERATURE SENSOR GROUND CIRCUIT

Check the continuity between quick charge port harness connector and ground.

+		-	Continuity
Quick charge port			
Connector	Terminal		
E7	5	Ground	Existed

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace error-detected parts.

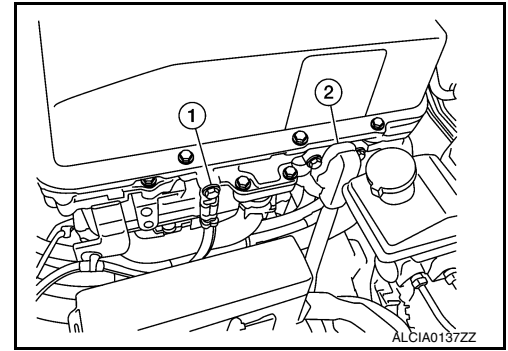
### 7.CHECK 12V BATTERY NEGATIVE CABLE ON PDM (POWER DELIVERY MODULE) SIDE (1)

## B2980 QUICK CHARGE PORT

### < DTC/CIRCUIT DIAGNOSIS >

Check the installation of 12V battery negative cable① on PDM (Power Delivery Module) side.

② : 12V battery positive cable



#### Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace 12V battery negative cable on PDM (Power Delivery Module) side connection.

### 8.CHECK 12V BATTERY NEGATIVE CABLE ON PDM (POWER DELIVERY MODULE) SIDE (2)

Check the continuity between 12V battery negative cable① on PDM (Power Delivery Module) side and ground.

+		-	Continuity
PDM (Power Delivery Module)			
Connector	Terminal		
F32	51	Ground	Existed

#### Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair or replace error-detected parts.

### 9.CHECK INTERMITTENT INCIDENT

Check the intermittent incident. Refer to [GI-53. "Intermittent Incident"](#).

#### Is the inspection result normal?

YES >> Replace PDM (Power Delivery Module). Refer to [VC-119. "Removal and Installation"](#).

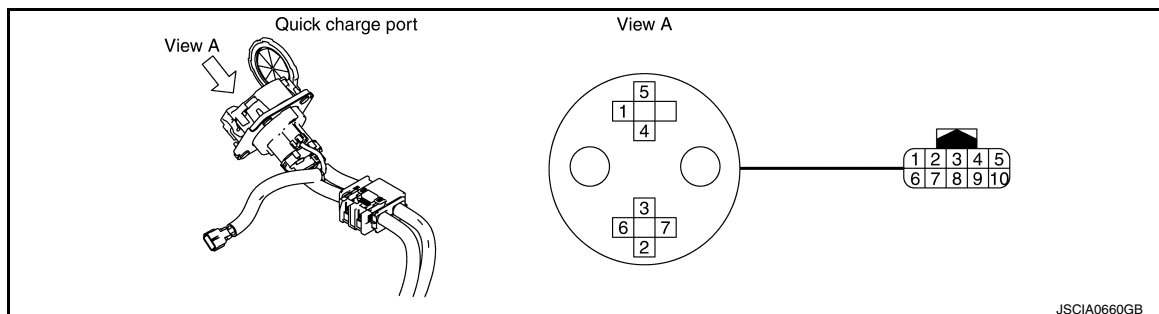
NO >> Repair or replace error-detected parts.

## Component Inspection

INFOID:000000009301068

### 1.CHECK QUICK CHARGE PORT

1. Disconnect quick charge port harness connector.
2. Check the continuity between quick charge port terminals and quick charge port side harness connector of same terminals.



#### Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace quick charge port. Refer to [VC-135. "Removal and Installation"](#).

### 2.CHECK QUICK CHARGE PORT TEMPERATURE SENSOR

Check the resistance between quick charge port side harness connector terminals.

## B2980 QUICK CHARGE PORT

### < DTC/CIRCUIT DIAGNOSIS >

Quick charge side harness connector		Condition		Resistance (kΩ)
Terminal				
5	9	Temperature [°C (°F)]	-40 – 50 (-40 – 122)	4 – 170
	10			

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace quick charge port. Refer to [VC-135. "Removal and Installation"](#).

A

B

VC

D

E

F

G

H

I

J

K

L

M

N

O

P

## B29A0 NORMAL CHARGE PORT

< DTC/CIRCUIT DIAGNOSIS >

### B29A0 NORMAL CHARGE PORT

#### DTC Logic

INFOID:000000009300111

#### DTC DETECTION LOGIC

DTC	CONSULT display (Malfunction type)	DTC detection condition	Possible causes
B29A0	A N/CHG PORT ENGAGEMENT ERROR (Signal stuck high)	<ul style="list-style-type: none"><li>At the start of charging or during charging, the EVSE connection detection signal voltage is approximately 4.8 V or more, or 1.0 V or less, continuously for 3 seconds or more.</li><li>During normal charging, the EVSE connection detection signal voltage is approximately 3.3 V or more continuously for 3 seconds or more.</li></ul>	<ul style="list-style-type: none"><li>Harness and connector (Normal charge port circuit is open or shorted.)</li><li>Normal charge port</li><li>EVSE</li><li>PDM (Power Delivery Module)</li></ul>
	B N/CHG PORT ENGAGEMENT ERROR (Signal invalid)	During normal charging, the EVSE connection detection signal voltage is approximately 3.7 – 4.8 V continuously for 100 seconds or more.	<ul style="list-style-type: none"><li>Harness and connector (Normal charge port circuit is open or shorted.)</li><li>Normal charge port</li></ul>

#### DTC CONFIRMATION PROCEDURE

##### TYPE A

#### 1.PERFORM DTC CONFIRMATION PROCEDURE

##### With CONSULT

- Perform normal charging for 10 seconds or more.
- Turn power switch ON.
- Check “Self-diagnosis result” of “CHARGER/PD MODULE”.

##### Is DTC detected?

- YES >> Proceed to [VC-100, "TYPE A : Diagnosis Procedure"](#).  
NO >> INSPECTION END

##### TYPE B

#### 1.PERFORM DTC CONFIRMATION PROCEDURE

##### With CONSULT

- Perform normal charging for 2 minutes or more.
- Turn power switch ON.
- Check “Self-diagnosis result” of “CHARGER/PD MODULE”.

##### Is DTC detected?

- YES >> Proceed to [VC-102, "TYPE B : Diagnosis Procedure"](#).  
NO >> INSPECTION END

##### TYPE A

#### TYPE A : Diagnosis Procedure

INFOID:000000009300112

#### 1.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

##### With CONSULT

- Turn power switch ON.
- Erase DTC.
- Turn power switch OFF.
- Perform DTC confirmation procedure again by using a EVSE other than the one is used for the previous DTC confirmation procedure. Refer to [VC-100, "DTC Logic"](#).

##### Is the DTC detected again?

- YES >> GO TO 2.  
NO >> Replace EVSE.

## B29A0 NORMAL CHARGE PORT

### < DTC/CIRCUIT DIAGNOSIS >

#### 2.CHECK NORMAL CHARGE PORT CONDITION

Check for any adhering foreign substances, cracking or damage on the normal charge port. Refer to [VC-59. "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Clean or replace the normal charge port. Refer to [VC-142. "Removal and Installation"](#).

#### 3.CHECK NORMAL CHARGE PORT

Check the normal charge port. Refer to [VC-102. "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace normal charge port. Refer to [VC-142. "Removal and Installation"](#).

#### 4.CHECK EVSE CONNECTION DETECTING CIRCUIT POWER SUPPLY

1. Turn power switch ON.
2. Check the voltage between normal charge port harness connector and ground.

+		–	Voltage
Normal charge port			
Connector	Terminal		
E25	2	Ground	5.0 V

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 5.

#### 5.CHECK EVSE CONNECTION DETECTING CIRCUIT

1. Turn power switch OFF.
2. Disconnect PDM (Power Delivery Module) harness connector<sup>Ⓐ</sup>.

↶ : Vehicle front

##### NOTE:

Loosen the PDM (Power Delivery Module) harness connector by rotating it counterclockwise and remove it.

3. Check the continuity between normal charge port harness connector and PDM (Power Delivery Module) harness connector.

Normal charge port		PDM (Power Delivery Module)		Continuity
Connector	Terminal	Connector	Terminal	
E25	2	F23	29	Existed

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

#### 6.CHECK INTERMITTENT INCIDENT

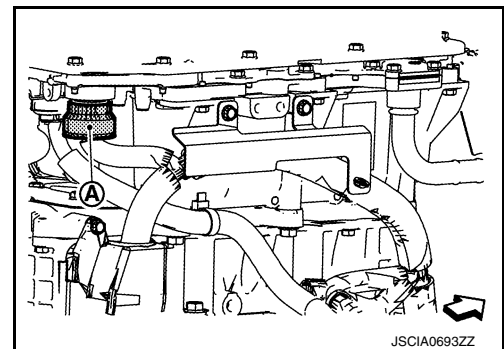
Check the intermittent incident. Refer to [GI-53. "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace PDM (Power Delivery Module). Refer to [VC-119. "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

TYPE B



## B29A0 NORMAL CHARGE PORT

< DTC/CIRCUIT DIAGNOSIS >

### TYPE B : Diagnosis Procedure

INFOID:000000009300113

#### 1.CHECK EVSE RELEASE SWITCH STATUS

Check that there are no operation malfunctions caused by dust or a foreign substance on the EVSE release switch.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or clean.

#### 2.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

##### With CONSULT

1. Turn power switch ON.
2. Erase DTC.
3. Turn power switch OFF.
4. Perform DTC confirmation procedure again by using a EVSE other than the one is used for the previous DTC confirmation procedure. Refer to [VC-103. "DTC Logic"](#).

Is the DTC detected again?

YES >> Check the intermittent incident. Refer to [GI-53. "Intermittent Incident"](#).

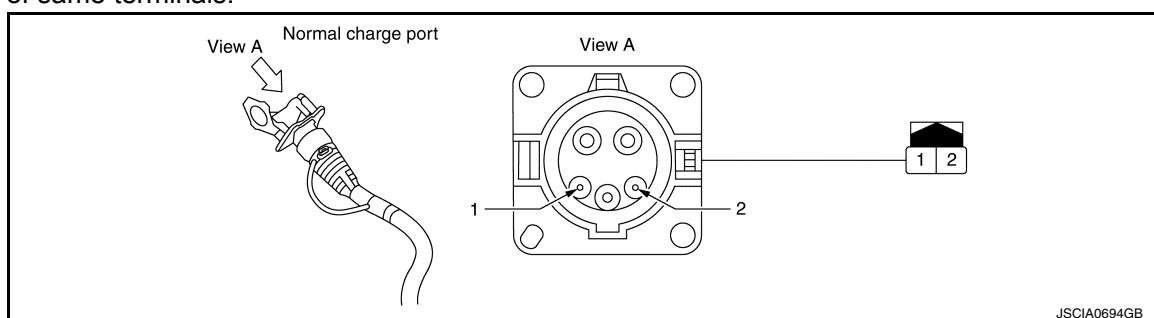
NO >> Replace EVSE.

### Component Inspection

INFOID:000000009300114

#### 1.CHECK NORMAL CHARGE PORT (1)

1. Disconnect normal charge port harness connector.
2. Check the continuity between normal charge port terminals and normal charge port side harness connector of same terminals.



Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace normal charge port. Refer to [VC-142. "Removal and Installation"](#).

#### 2.CHECK NORMAL CHARGE PORT (2)

Check the resistance between normal charge port side harness connector and PDM (Power Delivery Module) body [excluding PDM (Power Delivery Module) cover].

+	—	Resistance (kΩ)
Normal charge port side harness connector	PDM (Power Delivery Module) body [excluding PDM (Power Delivery Module) cover]	
Terminal		
2		2.43 – 2.97

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace normal charge port. Refer to [VC-142. "Removal and Installation"](#).

# B29C1 EVSE

< DTC/CIRCUIT DIAGNOSIS >

## B29C1 EVSE

### DTC Logic

INFOID:000000009300115

### DTC DETECTION LOGIC

DTC	CONSULT display (Malfunction type)		DTC detection condition	Possible causes
B29C1	A	EVSE (No signal)	<ul style="list-style-type: none"> <li>During normal charging, although the AC power source is being input, there is a break of the PWM communication signal from EVSE.</li> <li>Before normal charging or during normal charging, there is a peak value malfunction in the PWM communication signal from EVSE.</li> </ul>	<ul style="list-style-type: none"> <li>Harness and connector (Normal charge port circuit is open or shorted.)</li> <li>Normal charge port</li> <li>EVSE</li> <li>PDM (Power Delivery Module)</li> </ul>
	B	EVSE (Signal stuck low)	Before the start of normal charging or during normal charging, there is no AC power source input even though the PDM (Power Delivery Module) permits the start of charging.	
	C	EVSE (Unexpected operation)	Before the start of normal charging, there is AC power source input despite the fact that PWM communication is not received from EVSE.	<ul style="list-style-type: none"> <li>Harness and connector (Normal charge port circuit is open or shorted.)</li> <li>EVSE</li> <li>PDM (Power Delivery Module)</li> </ul>
	D	EVSE (Signal stuck high)	After charging is completed, AC power source continues to be input even though the PDM (Power Delivery Module) charging is stopped.	
	E	EVSE (Signal invalid)	When an error is detected in a PWM communication signal from EVSE during normal charge.	<ul style="list-style-type: none"> <li>Harness and connector (Normal charge port circuit is open or shorted.)</li> <li>Normal charge port</li> <li>EVSE</li> <li>PDM (Power Delivery Module)</li> </ul>

### DTC CONFIRMATION PROCEDURE

#### 1.CONFIRMATION FOR MALFUNCTION TYPE

Check the malfunction type.

Which is the malfunction type?

Types A, B, C or E>>GO TO 2.

Type D >> GO TO 3.

#### 2.PERFORM DTC CONFIRMATION PROCEDURE OF TYPE A, B, C OR E

##### With CONSULT

1. Perform normal charging for the time listed below.

Malfunction type		Time
A	No signal	1 minute or more
B	Signal stuck low	10 seconds or more
C	Unexpected operation	
E	Signal invalid	30 seconds or more

2. Turn power switch ON.

3. Check "Self-diagnosis result" of "CHARGER/PD MODULE".

Is DTC detected?

YES (TYPE A, B and E)>>Proceed to [VC-104, "TYPE A, B AND E : Diagnosis Procedure"](#).

YES (TYPE C)>>Proceed to [VC-105, "TYPE C AND D : Diagnosis Procedure"](#).

NO >> INSPECTION END

## &lt; DTC/CIRCUIT DIAGNOSIS &gt;

**3.PERFORM DTC CONFIRMATION PROCEDURE OF TYPE D****ⓘ With CONSULT**

1. Perform normal charging until charging is completed.
2. Turn power switch ON.
3. Check "Self-diagnosis result" of "CHARGER/PD MODULE".

Is DTC detected?

YES >> Proceed to [VC-105, "TYPE C AND D : Diagnosis Procedure"](#).

NO >> INSPECTION END

**TYPE A, B AND E****TYPE A, B AND E : Diagnosis Procedure**

INFOID:000000009300116

**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 [VC-6, "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.

**1.CHECK SELF-DIAGNOSTIC RESULT IN VCM****ⓘ With CONSULT**

1. Turn power switch ON.
2. Check "Self-diagnosis result" of "EV/HEV".

Is DTC detected?

YES >> Perform diagnosis procedure corresponding to DTC indicated. Refer to [EVC-102, "DTC Index"](#).

NO >> GO TO 2.

**2.PERFORM DTC CONFIRMATION PROCEDURE AGAIN****ⓘ With CONSULT**

1. Erase DTC.
2. Turn power switch OFF.
3. Perform DTC confirmation procedure again by using EVSE different from the one used for the previous DTC confirmation procedure. Reform to [VC-103, "DTC Logic"](#).

Is the DTC detected again?

YES >> GO TO 3.

NO >> Replace EVSE.

**3.CHECK NORMAL CHARGE PORT CONDITION**

Check for any adhering foreign substances, cracking or damage on the normal charge port. Refer to [VC-59, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Clean or replace the normal charge port. Refer to [VC-142, "Removal and Installation"](#).



## B29C1 EVSE

### < DTC/CIRCUIT DIAGNOSIS >

#### 4.CHECK NORMAL CHARGE PORT

Check the normal charge port. Refer to [VC-102. "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace normal charge port. Refer to [VC-142. "Removal and Installation"](#).

#### 5.CHECK EVSE COMMUNICATION

1. Disconnect PDM (Power Delivery Module) harness connectorⒶ.

↶ : Vehicle front

##### NOTE:

Loosen the PDM (Power Delivery Module) harness connector by rotating it counterclockwise and remove it.

2. Check the continuity between PDM (Power Delivery Module) harness connector and normal charge port harness connector.

PDM (Power Delivery Module)		Normal charge port		Continuity
Connector	Terminal	Connector	Terminal	
F23	30	E25	1	Existed

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

#### 6.CHECK HIGH-VOLTAGE HARNESS

1. Remove normal charge port from PDM (Power Delivery Module). Refer to [VC-119. "Removal and Installation"](#).
2. Check the high-voltage harness continuity between the normal port and PDM (Power Delivery Module).

Normal charge port		PDM (Power Delivery Module)		Continuity
Connector	Terminal	Connector	Terminal	
H11	3	H9	47	Existed
	4		48	

Is the inspection result normal?

YES >> Replace PDM (Power Delivery Module) (Fuse is fusing). Refer to [VC-119. "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

### TYPE C AND D

#### TYPE C AND D : Diagnosis Procedure

INFOID:000000009300117

#### 1.CHECK EVSE SPECIFICATIONS

Check whether or not the EVSE conforms to the SAE-J1772 standard.

Is the correct EVSE being used?

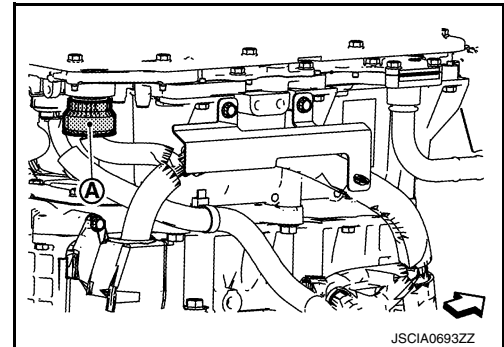
YES >> GO TO 2

NO >> Explain to the customer that the correct EVSE must be used.

#### 2.PERFORM DTC CONFIRMATION PROCEDURE AGAIN-2

##### Ⓐ With CONSULT

1. Turn power switch ON.
2. Erase DTC.
3. Turn power switch OFF.



## B29C1 EVSE

### < DTC/CIRCUIT DIAGNOSIS >

4. Perform DTC confirmation procedure again by using EVSE different from the one used for the previous DTC confirmation procedure. Refer to [VC-103, "DTC Logic"](#).

#### Is the DTC detected again?

- YES >> GO TO 3.  
NO >> Replace EVSE.

### 3.CHECK INTERMITTENT INCIDENT

Check the intermittent incident. Refer to [GI-53, "Intermittent Incident"](#).

#### Is the inspection result normal?

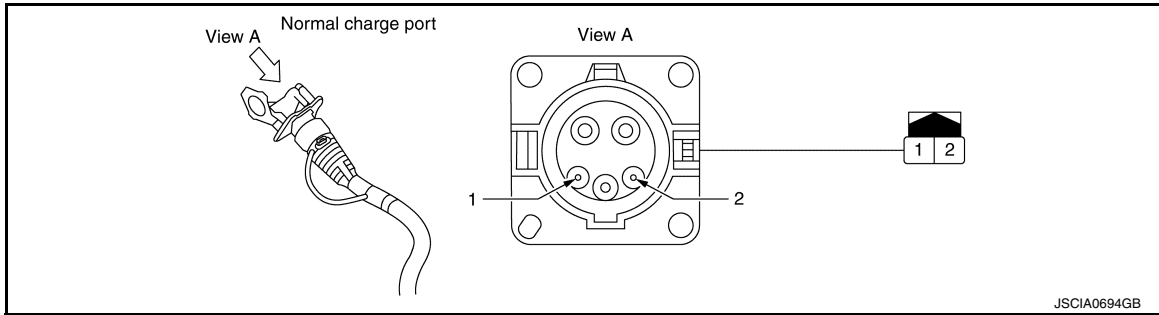
- YES >> Replace PDM (Power Delivery Module). Refer to [VC-119, "Removal and Installation"](#).  
NO >> Repair or replace error-detected parts.

## Component Inspection

INFOID:000000009301089

### 1.CHECK NORMAL CHARGE PORT (1)

1. Disconnect normal charge port harness connector.
2. Check the continuity between normal charge port terminals and normal charge port side harness connector of same terminals.



#### Is the inspection result normal?

- YES >> GO TO 2.  
NO >> Replace normal charge port. Refer to [VC-142, "Removal and Installation"](#).

### 2.CHECK NORMAL CHARGE PORT (2)

Check the resistance between normal charge port side harness connector and PDM (Power Delivery Module) body [excluding PDM (Power Delivery Module) cover].

+	-	
Normal charge port side harness connector	PDM (Power Delivery Module) body [excluding PDM (Power Delivery Module) cover]	Resistance (kΩ)
Terminal		
2		2.43 – 2.97

#### Is the inspection result normal?

- YES >> INSPECTION END  
NO >> Replace normal charge port. Refer to [VC-142, "Removal and Installation"](#).

# PDM(POWER DELIVERY MODULE)

< DTC/CIRCUIT DIAGNOSIS >

## PDM(POWER DELIVERY MODULE)

### Diagnosis Procedure

INFOID:000000009300118

#### **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 [VC-6, "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.

### 1. CHECK INSULATION RESISTANCE OF PDM (POWER DELIVERY MODULE)

1. Remove PDM (Power Delivery Module) from the vehicle. Refer to [VC-119, "Removal and Installation"](#).
2. Use an insulation resister to check the resistance between Li-ion battery high-voltage harness connector terminal (H3) and PDM (Power Delivery Module) body.

#### **WARNING:**



Unlike normal resistance testers, insulation resistance testers (multi tester) are used by applying a voltage of 500 V. For this reason, improper handling of an insulation resistance tester may cause an electric shock. In addition to this, if an insulation resistance tester is used to the 12 V circuit, its electric devices may be damaged. To avoid these hazards, carefully read the handling manual of insulation resistance tester and perform safe operation.

#### **CAUTION:**

- Set the insulation resistance tester (multi tester) at 500 V.
- To ensure correct polarity of the tester, always connect to the circuit in the forward direction.
- Wait for 30 seconds until the resistance becomes steady.
- If the inspection result shows that there is no continuity, check that the parts are mounted correctly.

+		–	Resistance
Li-ion battery high-voltage harness			
Connector	Terminal	PDM (Power Delivery Module) body	40 MΩ or more
H3	37		
	38		

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace PDM (Power Delivery Module) and high-voltage harness. Refer to [VC-119, "Removal and Installation"](#).

# VEHICLE CHARGING SYSTEM

< SYMPTOM DIAGNOSIS >

## SYMPTOM DIAGNOSIS

### VEHICLE CHARGING SYSTEM

#### Description

INFOID:000000008746510

#### VEHICLE CHARGING SYSTEM

Symptom	Probable malfunction location	Inspection item/reference
Charge port lid does not open.	<ul style="list-style-type: none"> <li>Charge port lid opener actuator operation circuit</li> <li>Charge port lid opener actuator</li> <li>Charge port lid opener switch</li> <li>VCM</li> </ul>	Charge port lid opener actuator circuit <a href="#">EVC-398, "Diagnosis Procedure"</a>
	Intelligent Key system	Intelligent Key system <a href="#">DLK-146, "Diagnosis Procedure"</a>
Charge port light does not illuminate.	<ul style="list-style-type: none"> <li>Charge port light</li> <li>Charge port light circuit</li> <li>VCM</li> </ul>	Charge port light circuit <a href="#">EVC-409, "Diagnosis Procedure"</a>
Charge connector does not lock.	<ul style="list-style-type: none"> <li>Charge connector lock actuator operating circuit</li> <li>Charge connector lock actuator</li> <li>VCM</li> </ul>	Charge connector lock actuator circuit <a href="#">EVC-396, "Diagnosis Procedure"</a>
	Charge connector lock switch	Charge connector lock switch <a href="#">EVC-400, "Diagnosis Procedure"</a>
	<ul style="list-style-type: none"> <li>Malfunction of charge connector lock actuator unit</li> <li>Malfunction of charge connector lock actuator installation</li> </ul>	Charge connector lock actuator <a href="#">EVC-396, "Component Inspection (Charge Connector Lock Actuator)"</a>
Charge connector does not unlock.	<ul style="list-style-type: none"> <li>Charge connector lock actuator operating circuit</li> <li>Charge connector lock actuator</li> <li>VCM</li> </ul>	Charge port lid opener actuator circuit <a href="#">EVC-396, "Diagnosis Procedure"</a>
	<ul style="list-style-type: none"> <li>Malfunction of charge connector lock actuator unit</li> <li>Malfunction of charge connector lock actuator installation</li> </ul>	Charge connector lock actuator <a href="#">EVC-396, "Component Inspection (Charge Connector Lock Actuator)"</a>
	Intelligent Key system	Intelligent Key system <a href="#">DLK-146, "Diagnosis Procedure"</a>
	Charge connector lock switch	Charge connector lock switch <a href="#">EVC-400, "Diagnosis Procedure"</a>
Charge connector cannot be inserted.	<ul style="list-style-type: none"> <li>Malfunction of charge connector lock actuator unit</li> <li>Malfunction of charge connector lock actuator installation</li> </ul>	Charge connector lock actuator <a href="#">EVC-396, "Component Inspection (Charge Connector Lock Actuator)"</a>
	Charge port malfunction (bent pins, entry of foreign material, etc.)	Inspection of charge port <a href="#">VC-59, "Inspection"</a>

# VEHICLE CHARGING SYSTEM

## < SYMPTOM DIAGNOSIS >

Symptom	Probable malfunction location	Inspection item/reference
Charging status indicator does not illuminate.	<ul style="list-style-type: none"> <li>Charging status indicator circuit</li> <li>VCM</li> </ul>	Charging status indicator circuit <a href="#">EVC-391, "Diagnosis Procedure"</a>
	Charging status indicator LED is blown.	<a href="#">VC-154, "Removal and Installation"</a>
Normal charge connector unlock sound does not operate. (Lock/unlock operation is normal.)	Vehicle Sound for Pedestrians (VSP)	<a href="#">VSP-60, "Symptom Table"</a>
Related to EV/power train (charge control)		<a href="#">EVC-412, "Symptom Index"</a>

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# NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

## NORMAL OPERATING CONDITION

### Symptom Table

INFOID:000000008746511

Symptoms	Check items	Solution
Immediate charge cannot be performed.	There is no power coming from the outlet.	Confirm that there has not been a power failure. Make sure the breaker is on. If an outlet with a timer device installed is used, power will only be available at the time set by the timer.
	The outlet plug is not connected correctly.	Confirm the outlet plug is connected correctly.
	The charge connector is not connected correctly.	Confirm the charge connector is connected correctly.
	Power switch is in the ON position.	Before charging, place power switch in the OFF position.
	Both the normal charge connector and the quick charge connector are connected.	Disconnect a connector of normal charge connector or quick charge connector. <b>NOTE:</b> Normal charge and quick charge cannot perform at the same time.
	Timer charge has been set.	Push immediate charging switch.
	The Li-ion battery is already fully charged.	No action. <b>NOTE:</b> Charging can not be performed if the Li-ion battery is already fully charged. Charging automatically stops if the Li-ion battery is fully charged.
	Charging does not start because the charge amount has been set to 80% and the Li-ion battery is already charged to more than 80%.	Confirm the charge percentage set in the timer charge. Change the charging percentage the desired charge setting.
	The temperature of the Li-ion battery is too hot or too cold to charge.	Confirm the Li-ion battery temperature in combination meter. <b>NOTE:</b> If the meter indicates the Li-ion battery is too hot (red zone) or too cold (blue zone), charging is not performed.
	The 12V battery is discharged.	Charge the 12V battery.
	Vehicle, EVSE, or quick charger malfunction.	<ul style="list-style-type: none"> <li>Check the PDM (Power Delivery Module) self-diagnosis results.</li> <li>Check by changing the combination of vehicle and EVSE.</li> </ul>
	When a NISSAN genuine EVSE is used, the grounding work on the socket side does not conform to NISSAN recommended work.	When connected to the socket where the phenomenon occurs, check the conditions of indicator lamp illumination on the control box. If the "READY" lamp is blinking, have a specialist check the conditions of grounding work on the socket side.

# NORMAL OPERATING CONDITION

## < SYMPTOM DIAGNOSIS >

Symptoms	Check items	Solution
Timer charge cannot be performed.	There is no power coming from the outlet.	Confirm that there has not been a power failure. Make sure the breaker is on. If an outlet with a timer device installed is used, power will only be available at the time set by the timer.
	The outlet plug is not connected correctly.	Confirm the outlet plug is connected correctly.
	The charge connector is not connected correctly.	Confirm the charge connector is connected correctly.
	Power switch is in the ON position.	Before charging, place power switch in the OFF position.
	Both the normal charge connector and the quick charge connector are connected.	Disconnect a connector of normal charge connector or quick charge connector. <b>NOTE:</b> Normal charge and quick charge cannot perform at the same time.
	The Li-ion battery is already fully charged.	No action <b>NOTE:</b> Charging cannot be performed if the Li-ion battery is already fully charged. Charging automatically stops if the Li-ion battery is fully charged.
	The temperature of the Li-ion battery is too hot or too cold to charge.	Confirm the Li-ion battery temperature in combination meter. <b>NOTE:</b> If the meter indicates the Li-ion battery is too hot (red zone) or too cold (blue zone), charging is not performed.
	The 12V battery is discharged.	Charge the 12V battery.
	Vehicle, EVSE, or quick charger malfunction.	<ul style="list-style-type: none"> <li>Check the PDM (Power Delivery Module) self-diagnosis results.</li> <li>Check by changing the combination of vehicle and EVSE.</li> </ul>
	The EVSE is not connected.	Connect the EVSE.
	Charging does not start because the timer charge start time and end time are set and the current time is before the set start time.	Confirm when the timer charge time is set to start charging. Change the timer charge setting to the desired charge time.
	Charging does not start because only the timer charge start time is set and the current time is after the set start time.	Confirm when the timer charge time is set to start charging. Change the timer charge setting to the desired charge time.
	Charging does not start because only the timer charge end time is set and the current time is after the set end time.	Confirm when the timer charge time is set to start charging. Change the timer charge setting to the desired charge time.
	Charging does not start because the charge amount has been set to 80% and the Li-ion battery is already charged to more than 80%.	Confirm the charge percentage set in the timer charge. Change the charging percentage the desired charge setting.
	The time on the clock is wrong.	Confirm that the date and time shown on the timer charge screen are the same as the clock on the navigation display. <b>NOTE:</b> If the 12V battery terminal is disconnected, the time setting must be updated. There must be a GPS signal to adjust the timer setting clock.
	The immediate charging switch has been pressed.	Check immediate charging switch.
	Timer charge has not been set.	Set the timer charge schedule.
	When a NISSAN genuine EVSE is used, the grounding work on the socket side does not conform to NISSAN recommended work.	When connected to the socket where the phenomenon occurs, check the conditions of indicator lamp illumination on the control box. If the "READY" lamp is blinking, have a specialist check the conditions of grounding work on the socket side.

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## NORMAL OPERATING CONDITION

### < SYMPTOM DIAGNOSIS >

Symptoms	Check items	Solution
Remote charge cannot be performed.	There is no power coming from the outlet.	Confirm that there has not been a power failure. Make sure the breaker is on. If an outlet with a timer device installed is used, power will only be available at the time set by the timer.
	The outlet plug is not connected correctly.	Confirm the outlet plug is connected correctly.
	The charge connector is not connected correctly.	Confirm the charge connector is connected correctly.
	Power switch is in the ON position.	Before charging, place power switch in the OFF position.
	Both the normal charge connector and the quick charge connector are connected.	Disconnect a connector of normal charge connector or quick charge connector. <b>NOTE:</b> Normal charge and quick charge cannot perform at the same time.
	Charging does not start because the charge amount has been set to 80% and the Li-ion battery is already charged to more than 80%.	Confirm the charge percentage set in the timer charge. Change the charging percentage the desired charge setting.
	The Li-ion battery is already fully charged.	No action <b>NOTE:</b> Charging can not be performed if the Li-ion battery is already fully charged. Charging automatically stops if the Li-ion battery is fully charged.
	The temperature of the Li-ion battery is too hot or too cold to charge.	Confirm the Li-ion battery temperature in combination meter. <b>NOTE:</b> If the meter indicates the Li-ion battery is too hot (red zone) or too cold (blue zone), charging is not performed.
	The 12V battery is discharged.	Charge the 12V battery.
	Vehicle, EVSE, or quick charger malfunction.	<ul style="list-style-type: none"> <li>Check the PDM (Power Delivery Module) self-diagnosis results.</li> <li>Check by changing the combination of vehicle and EVSE.</li> </ul>
	The EVSE is not connected.	Connect the EVSE.
	Communication with the vehicle cannot be established.	Confirm that there is a cellular signal in your location. Remote charge can not be started unless the web enabled smart phone can connect to the intent.
		Confirm that there is a cellular signal at the vehicle location.
	The vehicle is left standing for long time.	<b>NOTE:</b> If the power switch is in the OFF position for more than 2 weeks, the remote charge is not performed.
	When a NISSAN genuine EVSE is used, the grounding work on the socket side does not conform to NISSAN recommended work.	When connected to the socket where the phenomenon occurs, check the conditions of indicator lamp illumination on the control box. If the "READY" lamp is blinking, have a specialist check the conditions of grounding work on the socket side.



# NORMAL OPERATING CONDITION

## < SYMPTOM DIAGNOSIS >

Symptoms	Check items	Solution
Normal charge stops in the middle of charging.	There is no power coming from the outlet.	Confirm that there has not been a power failure. Make sure the breaker is on. If an outlet with a timer device installed is used, power will only be available at the time set by the timer.
	The EVSE has been disconnected.	Check that the EVSE has not been disconnected.
	The release switch has been pressed.	Release the release switch. <b>NOTE:</b> If the charge connector button is pressed for a long period of time, charging will be stopped.
	Timer charge end time has been reached.	perform normal charge (immediate charge). <b>NOTE:</b> When timer charge is set and the charge end time is reached, charging will be stopped, even if the Li-ion battery is not fully charged.
	The temperature of the Li-ion battery is too hot or too cold to charge.	Confirm the Li-ion battery temperature in combination meter. <b>NOTE:</b> If the meter indicates the Li-ion battery is too hot (red zone) or too cold (blue zone), charging is not performed.
	Vehicle, EVSE, or quick charger malfunction.	<ul style="list-style-type: none"> <li>Check the PDM (Power Delivery Module) self-diagnosis results.</li> <li>Check by changing the combination of vehicle and EVSE.</li> </ul>
The normal charging time is too long.	There is insufficient contact with the EVSE plug due to socket wear or another issue. (EVSE charging current is limited.)	<ul style="list-style-type: none"> <li>Inspect the socket which is used and the EVSE plug.</li> <li>Check by changing the combination of socket and EVSE.</li> </ul> <b>NOTE:</b> Insufficient contact limits the EVSE charging current or causes charging to stop. The charging current history can be checked from the "CHARGE CURRENT LIMITATION HISTORY" in the work support items for "CHARGER/PD MODULE" on CONSULT. Refer to <a href="#">VC-28, "CONSULT Function"</a> .

## NORMAL OPERATING CONDITION

### < SYMPTOM DIAGNOSIS >

Symptoms	Check items	Solution
Quick charge cannot be performed.	The charge connector is not connected correctly.	Check that the charge connector is connected correctly and that it is locked.
	The self-diagnostic function of the quick charger detects a isolation error.	<a href="#">VC-80</a>
	Power switch is in the ON position.	Before charging, place power switch in the OFF position.
	Both the normal charge connector and the quick charge connector are connected.	Disconnect a connector of normal charge connector or quick charge connector. <b>NOTE:</b> Normal charge and quick charge cannot perform at the same time.
	The Li-ion battery is already fully charged.	No action <b>NOTE:</b> Charging can not be performed if the Li-ion battery is already fully charged. Charging automatically stops if the Li-ion battery is fully charged.
	The temperature of the Li-ion battery is too hot or too cold to charge.	Confirm the Li-ion battery temperature in combination meter. <b>NOTE:</b> If the meter indicates the Li-ion battery is too hot (red zone) or too cold (blue zone), charging is not performed.
	The 12V battery is discharged.	Charge the 12V battery.
	Vehicle, EVSE, or quick charger malfunction.	<ul style="list-style-type: none"> <li>• Check the PDM (Power Delivery Module) self-diagnosis results.</li> <li>• Check by changing the combination of vehicle and EVSE.</li> </ul>
Quick charge stops in the middle of charging	The power switch of the quick charger is off.	Check the power switch of the quick charger.
	Both the normal charge connector and the quick charge connector are connected.	Disconnect a connector of normal charge connector or quick charge connector. <b>NOTE:</b> Normal charge and quick charge cannot perform at the same time.
	The temperature of the Li-ion battery is too hot or too cold to charge.	Confirm the Li-ion battery temperature in combination meter. <b>NOTE:</b> If the meter indicates the Li-ion battery is too hot (red zone) or too cold (blue zone), charging is not performed.
	Vehicle, EVSE, or quick charger malfunction.	<ul style="list-style-type: none"> <li>• Check the PDM (Power Delivery Module) self-diagnosis results.</li> <li>• Check by changing the combination of vehicle and EVSE.</li> </ul>
	Charging is stopped by the quick charge timer.	Perform quick charge again (as needed). <b>NOTE:</b> Charging will stop depending on the timer function setting of the quick charger. Perform quick charge again (as needed). <b>NOTE:</b> Charging will stop depending on the timer of the vehicle.
	Charging stops at 90% capacity.	Perform quick charge again (as needed). <b>NOTE:</b> When charging has been started when the Li-ion battery remaining energy is less than half, charging will stop when the energy reaches 90%.
	The power supply for the quick charger is OFF.	Check whether the power supply for the quick charger is off.

## NORMAL OPERATING CONDITION

### < SYMPTOM DIAGNOSIS >

Symptoms	Check items	Solution
Charge connector does not lock.	VCM does not start.	Turn power switch ON.
	Foreign material is trapped in the swing arm portion of the charge connector lock actuator.	Remove foreign material.
	Incorrect operation of release switch when charge connector is connected	Disconnect and reconnect the charge connector. <b>NOTE:</b> When the charge connector is connected, slowly releasing the release switch or repeatedly pressing and releasing the switch causes the lock mechanism to interfere with the release switch.

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## < REMOVAL AND INSTALLATION >

## PDM(POWER DELIVERY MODULE)

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# SEC. 290•291

Diagram illustrating the assembly of the rear suspension and chassis components, showing the engine, transmission, and various mounting brackets and bolts. The diagram includes numbered callouts (1-18) and torque specifications (10.0, 13.5, 25.0) for various bolts.

**Key Components and Torque Specifications:**

- 10.0 (1.0, 89):** Torque specification for bolts 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18.
- 13.5 (1.4, 10):** Torque specification for bolts 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18.
- 25.0 (2.6, 18):** Torque specification for bolts 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18.







**Inset Diagrams:**

- A:** Detailed view of the engine and transmission assembly, showing the mounting brackets and bolts.
- B:** Detailed view of the chassis and suspension assembly, showing the mounting brackets and bolts.

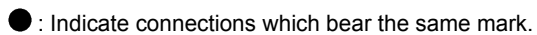
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# PDM(POWER DELIVERY MODULE)

## < REMOVAL AND INSTALLATION >

- |  |  |  |    |
|--|--|--|----|
| ① PDM (Power Delivery Module)  | ② Quick charge port  | ③ Normal charge port   | A  |
| ④ Cable bracket  | ⑤ 12 V negative battery cable  | ⑥ Water hose   | B  |
| ⑦ Clamp  | ⑧ Gasket   | ⑨ Charge port harness bracket  | B  |
| ⑩ Li-ion battery high-voltage harness bracket (center)   | ⑪ 12V positive battery cable   | ⑫ Li-ion battery high-voltage harness  | VC |
| ⑬ Li-ion battery high-voltage harness bracket (rear)   | ⑭ High-voltage warning label   | ⑮ Breather   | VC |
| ⑯ Normal charge port harness bracket   | ⑰ Li-ion battery high-voltage harness bracket (front)  | ⑱ Bus bar cover  | D  |
|  Arrow view                         |  Arrow view |  To electric water pump | D  |
|  : N·m (kg-m, ft-lb)                |  |  | E  |
|  : N·m (kg-m, in-lb)                |  |  | E  |
|  : Always replace after disassembly |  |  | F  |
| ●, ■, ▲, ▼ Indicate connections which bear the same mark.  |  |  | F  |

## DISASSEMBLY




# PDM(POWER DELIVERY MODULE)

## < REMOVAL AND INSTALLATION >

### Removal and Installation

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#### **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 [VC-6, "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 high voltage. Refer to [GI-33, "How to Disconnect High Voltage"](#).

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

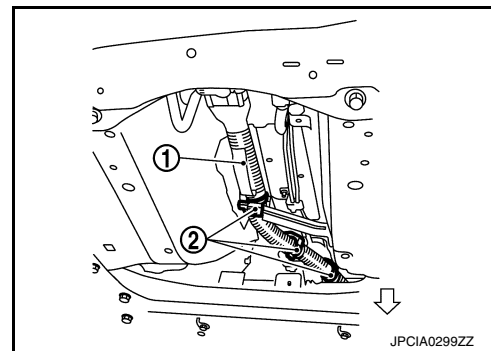
#### **WARNING:**

 Be sure to put on insulating protective gear before beginning work on the high voltage system.



- a. Lift up the vehicle and remove the Li-ion battery under covers. Refer to [EVB-194, "Exploded View"](#).
- b. Remove high voltage harness ① from clamp ②.

⇐ : Vehicle front



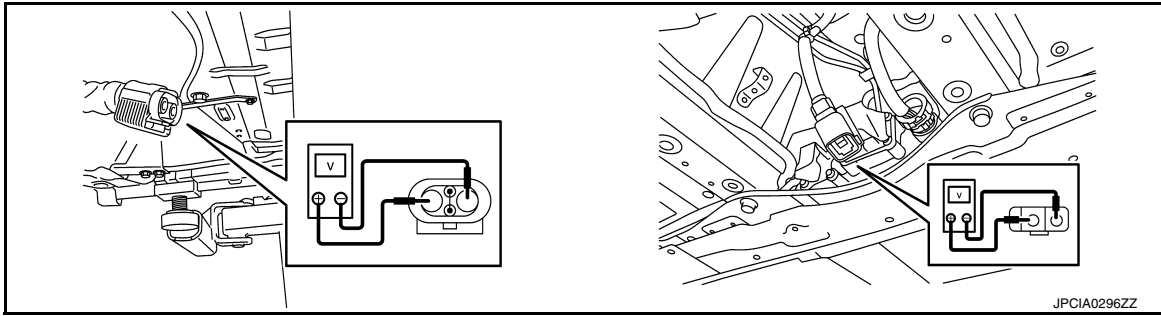
- c. Disconnect high voltage harness connector and high voltage harness for PTC heater from front side of Li-ion battery. Refer to [EVB-194, "Removal and Installation"](#).
- d. Measure voltage between high voltage harness connector terminals and high voltage harness connector terminals for PTC heater.

#### **DANGER:**

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

# PDM(POWER DELIVERY MODULE)

## < REMOVAL AND INSTALLATION >



Standard : 5 V or less

### CAUTION:

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

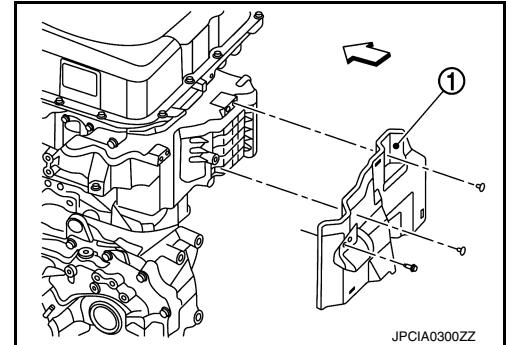
2. Drain coolant. Refer to [HCO-11, "Draining"](#).
3. Remove the cowl top extension. Refer to [EXT-19, "Removal and Installation"](#).
4. Remove the acoustic insulating plate ① located on the rear of the PDM (Power Delivery Module).

← : Vehicle front

### WARNING:



Be sure to put on insulating protective gear before beginning work on the high voltage system.



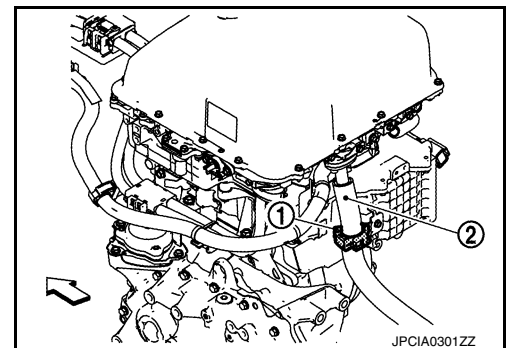
5. Remove the Li-ion battery high-voltage harness ② from the clamp ①.

← : Vehicle front

### WARNING:



Be sure to put on insulating protective gear before beginning work on the high voltage system.



6. Remove the normal charge port harness clamp ④ from the harness bracket.

### WARNING:

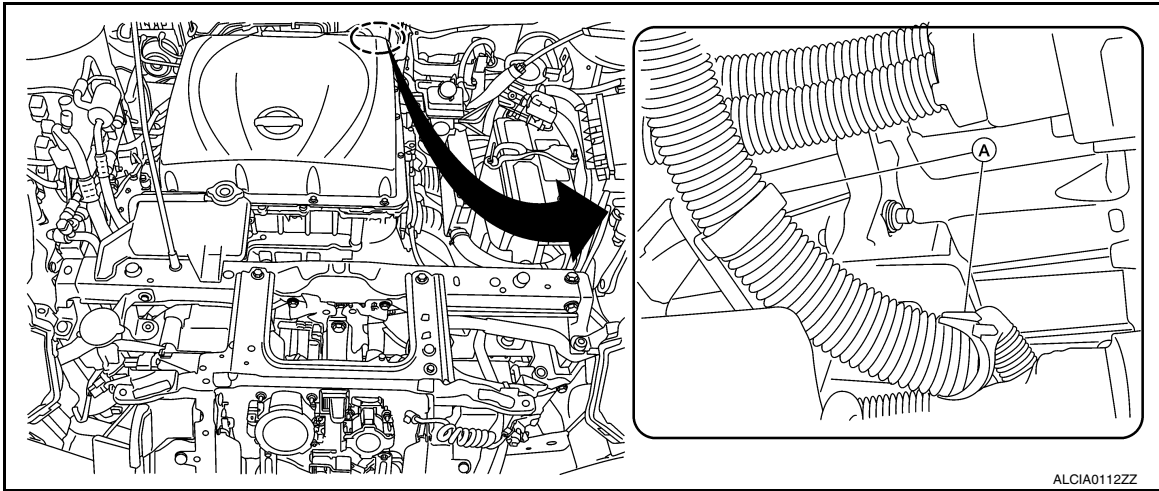


Be sure to put on insulating protective gear before beginning work on the high voltage system.



# PDM(POWER DELIVERY MODULE)

## < REMOVAL AND INSTALLATION >



7. Remove the radiator upper grille. Refer to [DLK-180, "RADIATOR UPPER GRILLE : Removal and Installation"](#).
8. Remove the reservoir tank. Refer to [HCO-14, "Exploded View"](#).
9. Disconnect the electric compressor high-voltage harness connector and low-voltage harness connector. Refer to [HA-37, "Removal and Installation"](#) (WITH HEAT PUMP SYSTEM), or [HA-95, "Removal and Installation"](#) (WITHOUT HEAT PUMP SYSTEM).

### **WARNING:**



Be sure to put on insulating protective gear before beginning work on the high voltage system.

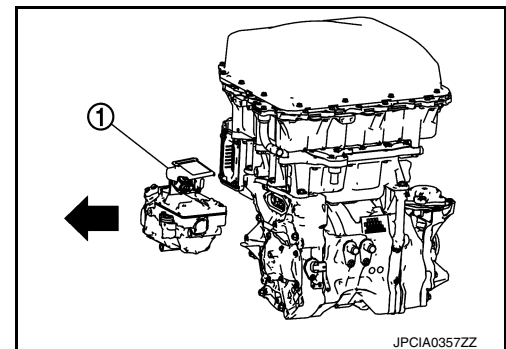


10. Remove the right front wheel.
11. Remove the front side of the right fender protector in order to secure work space for removal of the electric compressor mounting bolts.
12. Remove the electric compressor mounting bolts and move the electric compressor ① in the direction of the arrow (←). Refer to [HA-37, "Exploded View"](#) (WITH HEAT PUMP SYSTEM) or [HA-95, "Exploded View"](#) (WITHOUT HEAT PUMP SYSTEM).

### **WARNING:**



Be sure to put on insulating protective gear before beginning work on the high voltage system.



### **NOTE:**

Use rope or other means to fasten the electric compressor in a location where it does not interfere with work.

## PDM(POWER DELIVERY MODULE)

### < REMOVAL AND INSTALLATION >

13. Disconnect water hose ① and water hose ③.

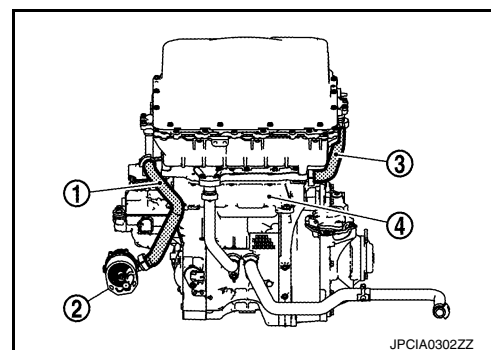
② : Electric water pump

④ : Inverter

#### WARNING:



Be sure to put on insulating protective gear before beginning work on the high voltage system.

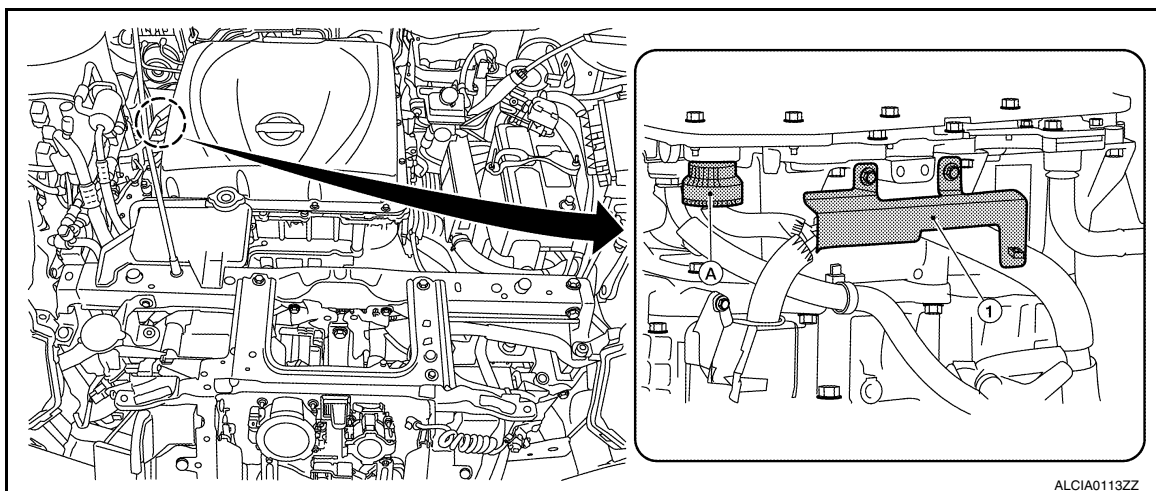


14. Remove the PDM (Power Delivery Module) harness connector ①, then remove the harness bracket ①.

#### WARNING:



Be sure to put on insulating protective gear before beginning work on the high voltage system.



#### NOTE:

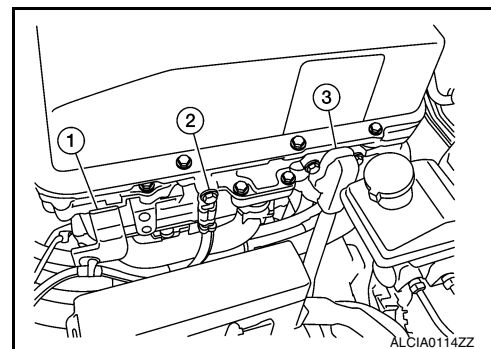
Loosen the PDM (Power Delivery Module) harness connector by rotating it counterclockwise and remove it.

15. Remove the bracket ①, and disconnect the 12 V battery negative cable ② and 12 V battery positive cable ③ on the PDM (Power Delivery Module) side.

#### WARNING:



Be sure to put on insulating protective gear before beginning work on the high voltage system.



16. Remove the normal charge port and quick charge port. Refer to [VC-142. "Removal and Installation"](#) (normal charge port) and [VC-135. "Removal and Installation"](#) (quick charge port).

#### WARNING:



Be sure to put on insulating protective gear before beginning work on the high voltage system.

# PDM(POWER DELIVERY MODULE)

## < REMOVAL AND INSTALLATION >



17. Remove the bus bar cover ① and remove the bus bar fastening bolt ② between the PDM (Power Delivery Module) and inverter.

← : Vehicle front

### WARNING:

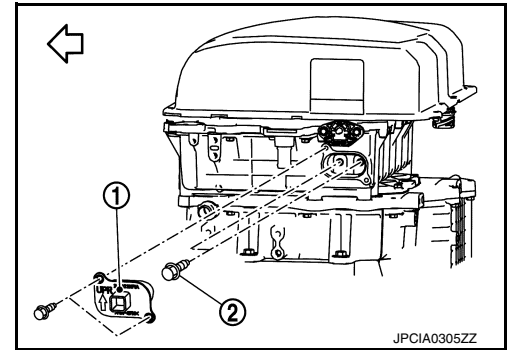


Be sure to put on insulating protective gear before beginning work on the high voltage system.



### CAUTION:

Must be opening of PDM (Power Delivery Module) with a tape or equivalent to seal out foreign materials.

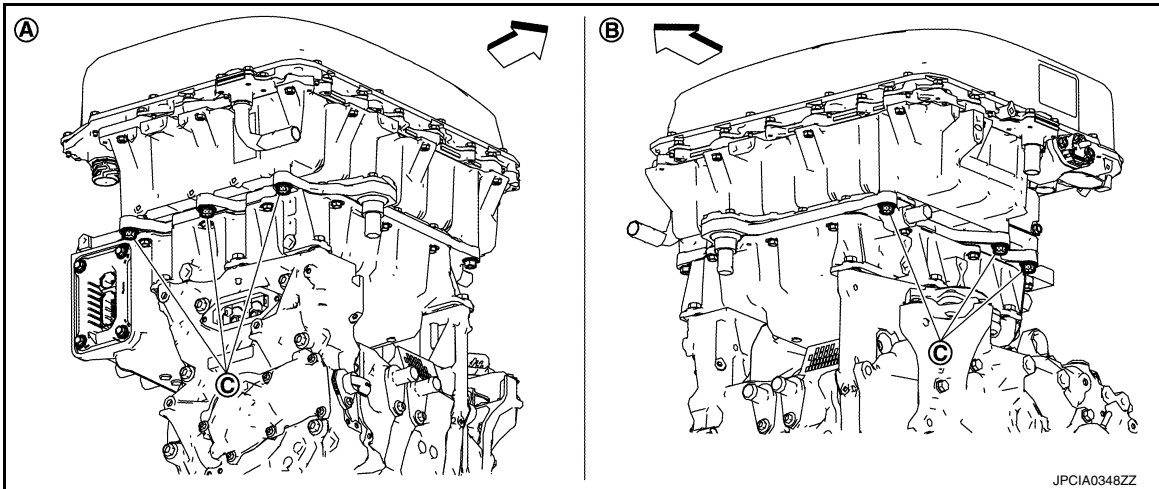


18. Remove the PDM (Power Delivery Module) mounting bolts ③.

### WARNING:



Be sure to put on insulating protective gear before beginning work on the high voltage system.



Ⓐ PDM (Power Delivery Module) right side

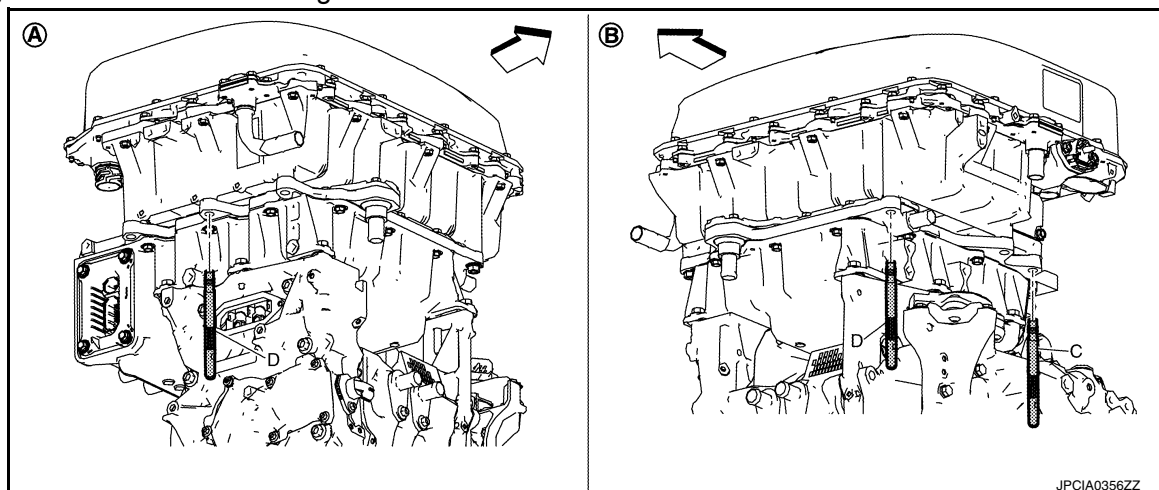
Ⓑ PDM (Power Delivery Module) left side

← Vehicle front

## PDM(POWER DELIVERY MODULE)

### < REMOVAL AND INSTALLATION >

19. Insert guide pins [SST: KV99112300 (J-50150)] (C) and (D) into the PDM (Power Delivery Module) mounting bolt holes shown in the figure.



- Ⓐ PDM (Power Delivery Module) right side    Ⓑ PDM (Power Delivery Module) left side  
C Guide pin (106 mm)    D Guide pin (96 mm)

↖ Vehicle front

#### NOTE:

Install and remove the guide pins by hand.

20. Install the engine slinger (service part) onto the PDM (Power Delivery Module).

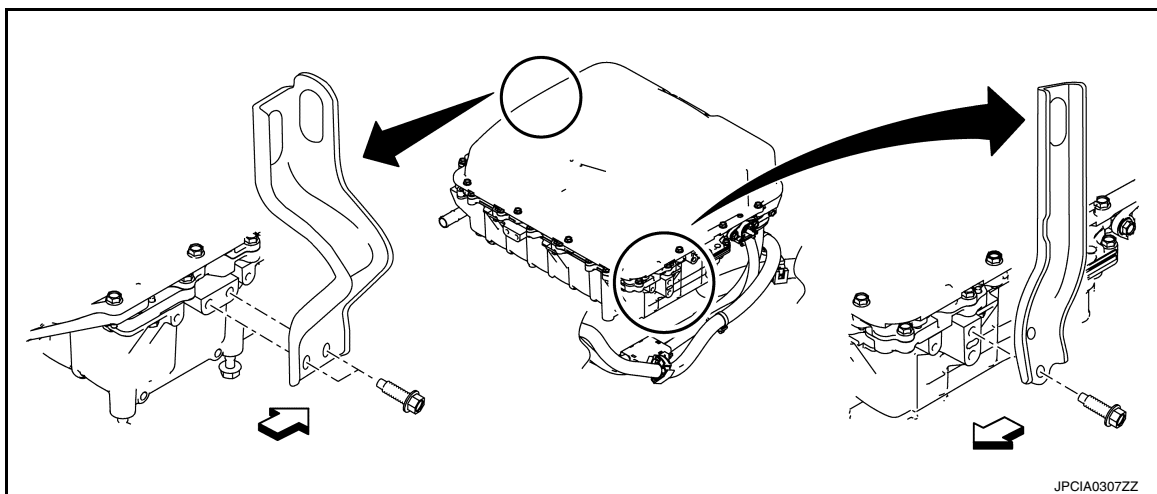
#### NOTE:

- Parts number
  - Engine slinger (LH) : 10006 MA00B
  - Engine slinger (RH) : 10006 AG01A
  - Engine slinger mounting bolt (RH) : 01125 N8031
  - Engine slinger mounting bolt (LH) : 01125 N8061

#### WARNING:



Be sure to put on insulating protective gear before beginning work on the high voltage system.



#### NOTE:

- Fasten the left engine slinger with a bolt at 1 location.

↖ Vehicle front

## PDM(POWER DELIVERY MODULE)

### < REMOVAL AND INSTALLATION >

- Tighten the engine slinger mounting bolts to the following torque.

**Tightening torque value : 25 N·m (2.6 kg-m)**

21. Install the slinger and shackle [SST: KV99112200 (J-50149)] onto the left and right engine slingers, then install the engine crane.

**WARNING:**

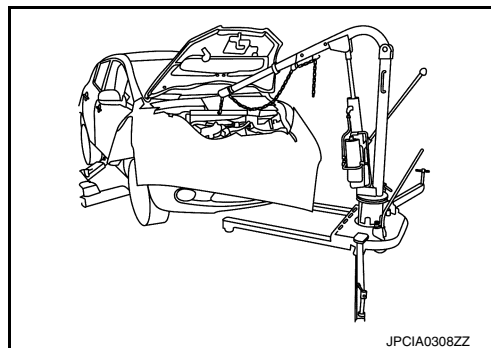


**Be sure to put on insulating protective gear before beginning work on the high voltage system.**



**NOTE:**

Because of the engine hood rod, install the engine slinger from the vehicle left side.



22. Separate the PDM (Power Delivery Module) from the inverter.

**WARNING:**



**Be sure to put on insulating protective gear before beginning work on the high voltage system.**



- Because the bus bar gasket is difficult to remove, gently rock the PDM (Power Delivery Module) while raising the engine crane.
- When lifting with the engine crane, the PDM (Power Delivery Module) tilts. Therefore hold the bus bar side (vehicle left side) while raising the engine crane.
- When the PDM (Power Delivery Module) has been raised to at or above the height of the bus bar, move the engine crane, avoiding the bus bar, and pull to remove the locating pin.

**CAUTION:**

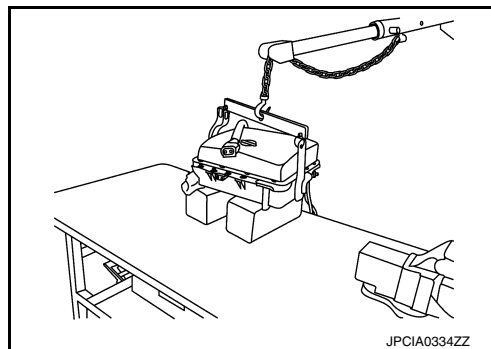
- **Be careful that the engine crane does not contact the hood.**
- **When removing, be careful that the PDM (Power Delivery Module) does not contact the windshield glass.**
- **When moving, be careful that the PDM (Power Delivery Module) does not contact the high-voltage bus bar.**

23. Prepare the work bench, and lower the PDM (Power Delivery Module) onto blocks of wood or similar material.

**WARNING:**





**Be sure to put on insulating protective gear before beginning work on the high voltage system.**




**CAUTION:**

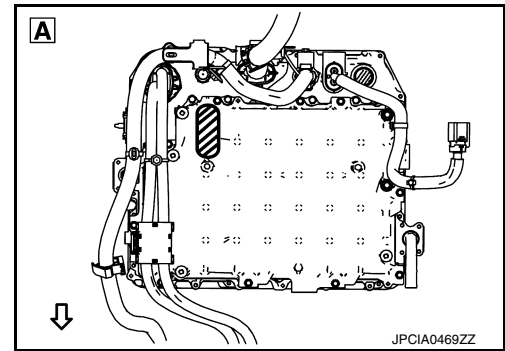
## PDM(POWER DELIVERY MODULE)

### < REMOVAL AND INSTALLATION >

- Never place it in the opening area (shaded area ) located at the back of PDM (Power Delivery Module). Place it on other area such as a place of wood.
- To prevent the intrusion of foreign matter such as dust and dirt into PDM (Power Delivery Module), cover the opening area (shaded area ) located at the back of PDM (Power Delivery Module) with a tape.

 : Back of PDM (Power Delivery Module)

 : Front of PDM (Power Delivery Module)



24. Cover the high-voltage bus bar with shop paper ①.

#### **WARNING:**

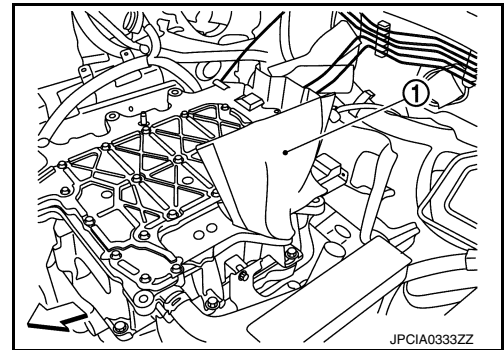


Be sure to put on insulating protective gear before beginning work on the high voltage system.



#### **CAUTION:**

Be sure to protect the high-voltage bus bar with clean shop paper so that dust, dirt, and other substances do not enter the driver motor. If the high-voltage bus bar is touched or if the high-voltage bus bar is dirty, clean it using ethanol.



### INSTALLATION

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

#### **WARNING:**



Be sure to put on insulating protective gear before beginning work on the high voltage system.



#### **CAUTION:**

- Be sure to reinstall high voltage harness clips in their original positions. If a clip is damaged, replace it with a new clip before installing.
- Be sure to perform correct air bleeding after adding coolant. Refer to [HCO-12, "Refilling"](#).
- After all parts are installed, be sure to check equipotential. Refer to [VC-132, "Inspection"](#).

### Disassembly and Assembly

INFOID:000000009353570

### DISASSEMBLY

#### **CAUTION:**

- Always prepare a protective cover [service parts number: 291X2 3NF0A] before checking/replacing the following parts that the cover of PDM (Power Delivery Module) is required to be opened.
- PDM (Power Delivery Module)
- Quick charge port
- Normal charge port
- Electric compressor harness
- Li-ion battery high-voltage harness

1. In order to prevent dust or other substances on the PDM (Power Delivery Module) cover from entering into the PDM (Power Delivery Module), wipe away any dirt from the PDM (Power Delivery Module) cover using dry shop cloth or similar material.

#### **WARNING:**



Be sure to put on insulating protective gear before beginning work on the high voltage system.



## PDM(POWER DELIVERY MODULE)

### < REMOVAL AND INSTALLATION >



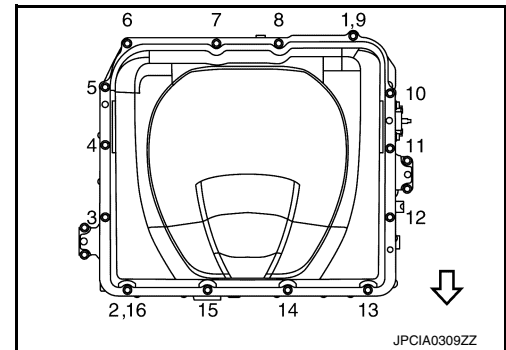
2. Remove the PDM (Power Delivery Module) cover mounting bolts in the order from 16 to 3 as shown in the figure.

⇐ : Vehicle front

#### WARNING:



Be sure to put on insulating protective gear before beginning work on the high voltage system.

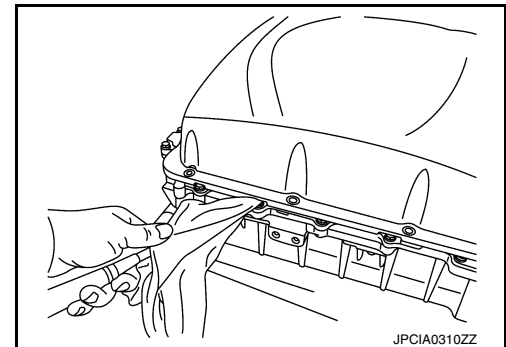


3. Use a flathead screwdriver, pawl, or similar tool to pry open a part of the PDM (Power Delivery Module) cover and cut away the liquid gasket.

#### WARNING:



Be sure to put on insulating protective gear before beginning work on the high voltage system.

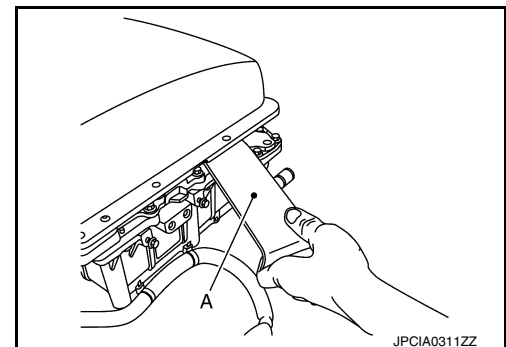


#### CAUTION:

Wrap the flathead screwdriver with tape or shop cloth when working to avoid scratching the mounting surface.

#### NOTE:

If the gasket is difficult to separate, use a remover (A) to create clearance while cutting away the liquid gasket.

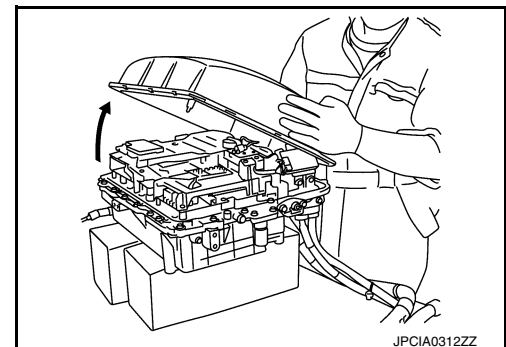


4. Wear anti-static gloves and remove the PDM (Power Delivery Module) cover by lifting first the rear then the front as shown in the figure.

#### WARNING:



Be sure to put on insulating protective gear before beginning work on the high voltage system.



#### CAUTION:

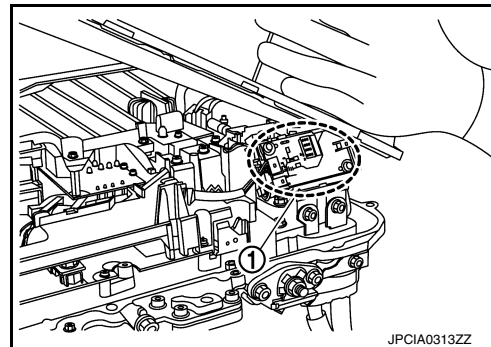
Anti-static gloves must be worn for all subsequent steps.

#### CAUTION:

## PDM(POWER DELIVERY MODULE)

### < REMOVAL AND INSTALLATION >

When lifting up the PDM (Power Delivery Module) cover, be careful not to contact the circuit board ①.



5. Install a protective cover ① [service parts number: 291X2 3NF0A].

**WARNING:**

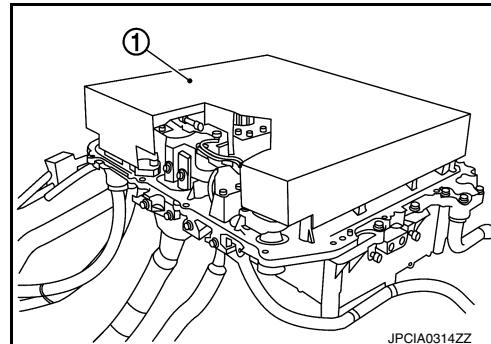


Be sure to put on insulating protective gear before beginning work on the high voltage system.



**CAUTION:**

- In order to prevent entry of dust or dirt into the circuit board section, install the protective cover immediately after removing the PDM (Power Delivery Module) cover.

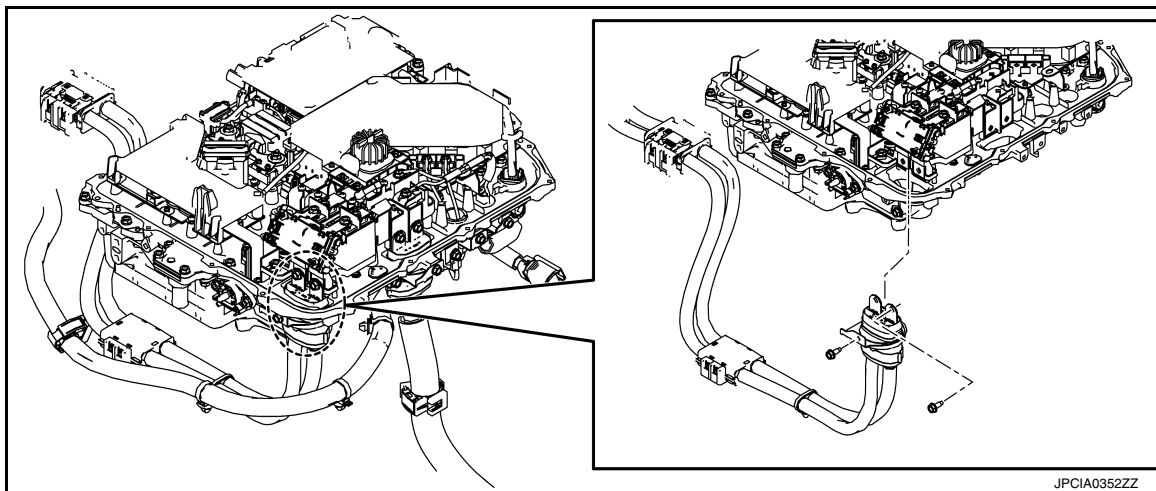


6. Remove the mounting bolt and screw from each high-voltage terminal, then remove the high-voltage terminals from the PDM (Power Delivery Module).
- Removing the quick charge port

**WARNING:**



Be sure to put on insulating protective gear before beginning work on the high voltage system.

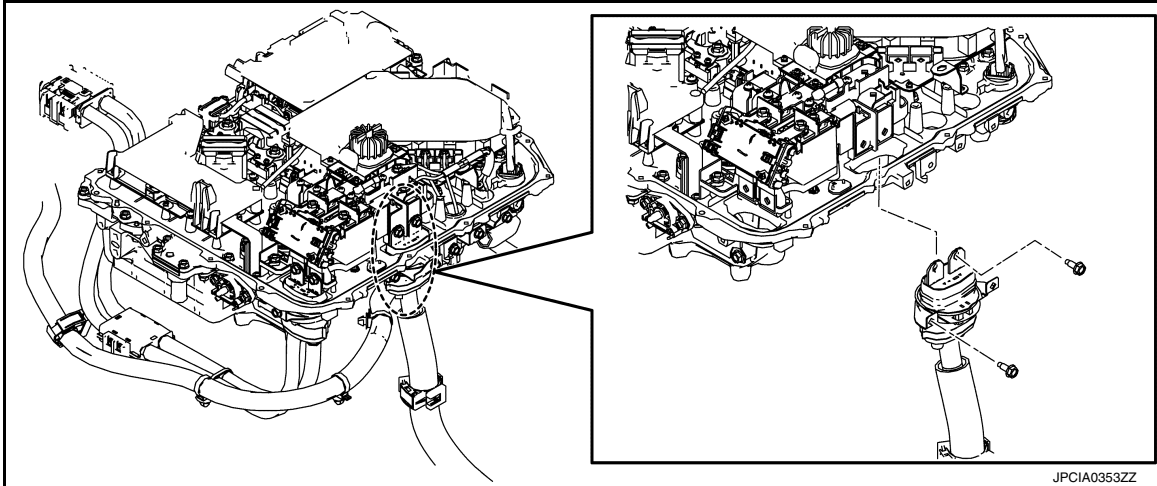




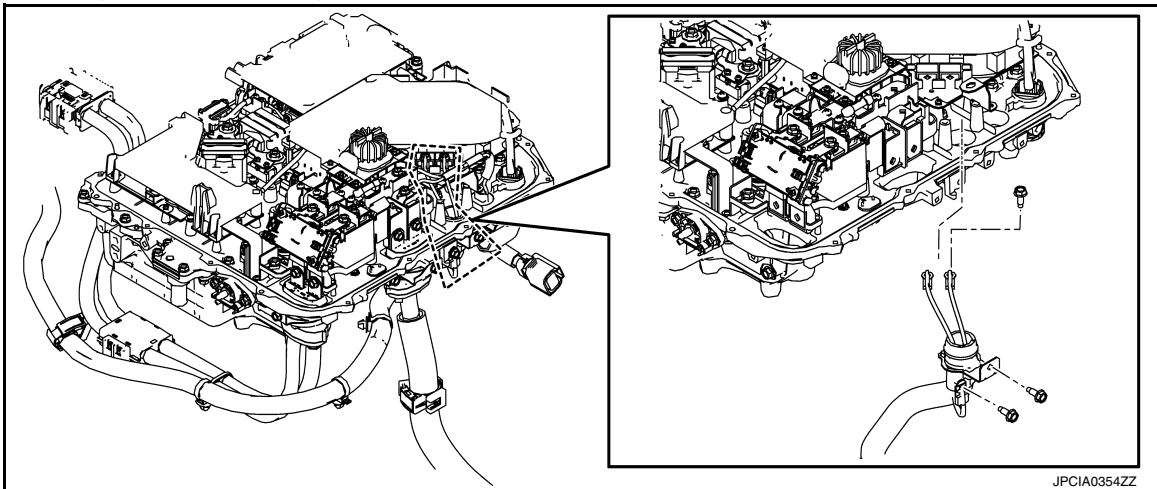
## PDM(POWER DELIVERY MODULE)

### < REMOVAL AND INSTALLATION >

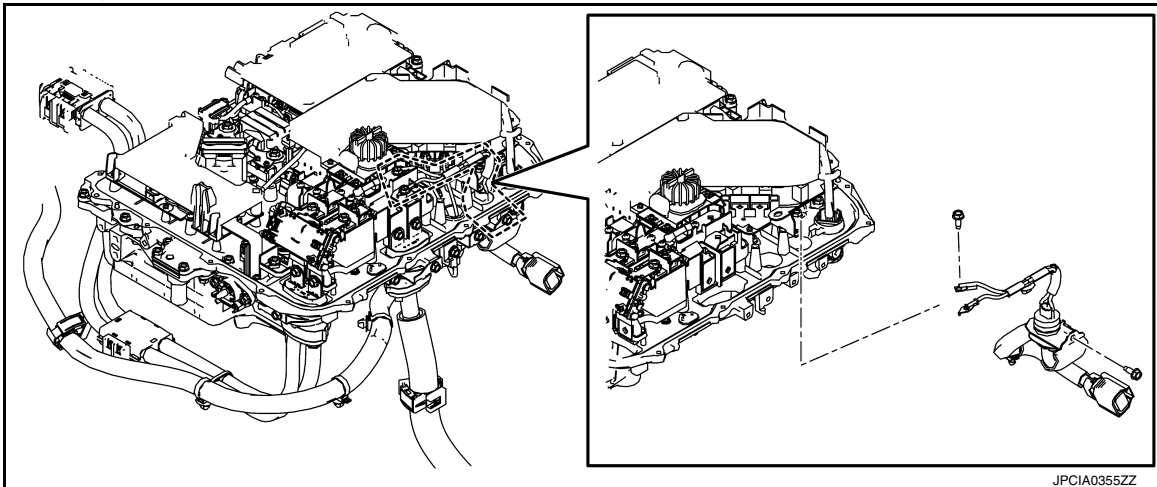
- Removing the Li-ion battery high-voltage harness



- Removing the normal charge port




- Removing the electric compressor harness



### ASSEMBLY

1. Install each of the high-voltage harnesses.
2. Use an acrylic scraper [SST: KV10120900 (J-51053)] and remove the old liquid gasket from the mounting surface.

#### **WARNING:**

-  Be sure to put on insulating protective gear before beginning work on the high voltage system.

## PDM(POWER DELIVERY MODULE)

### < REMOVAL AND INSTALLATION >



- Do not use a metal scraper as it may produce metal particles.

#### CAUTION:

- Work with the protective cover installed.
- Do not use an air blow.
- Do not use part cleaner.
- Do not use gasket remover.
- Be careful that the removed liquid gasket does not enter into the circuit board.

3. Moisten shop paper with ethanol, and degrease the liquid gasket application surface.

#### WARNING:



Be sure to put on insulating protective gear before beginning work on the high voltage system.



#### CAUTION:

- Do not use part cleaner.
- Do not use gasket remover.

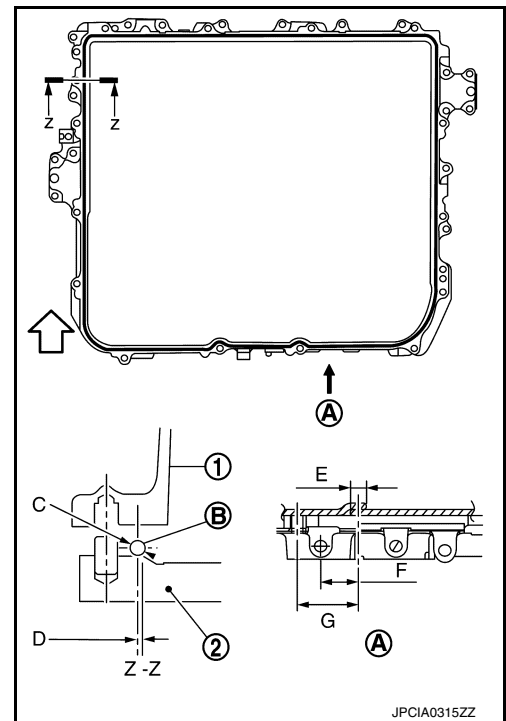
4. Apply liquid gasket (B) (Three Bond 1217H or an equivalent) to the position shown in the figure, checking that there are no gaps.

- ① : PDM (Power Delivery Module) cover side
- ② : PDM (Power Delivery Module) side
- ⇐ : Vehicle front
- (A) : Start and end point of liquid gasket application
- C :  $\phi 3.4 - 5.1$  mm (0.314 - 0.201 in )
- D : 1.3 mm ( 0.051 in )
- E : 10 - 15 mm ( 0.39 - 0.59 in )
- F : 23.5 mm ( 0.925 in )
- G : 38 - 43 mm ( 1.50 - 1.69 in )

#### WARNING:



Be sure to put on insulating protective gear before beginning work on the high voltage system.



5. Remove the protective cover.

#### WARNING:



Be sure to put on insulating protective gear before beginning work on the high voltage system.



#### CAUTION:

Remove the protective cover slowly in order to prevent any dust or other substances on the protective cover from entering the inside.

6. Lower the PDM (Power Delivery Module) cover vertically to install it.

#### WARNING:

# PDM(POWER DELIVERY MODULE)

## < REMOVAL AND INSTALLATION >



Be sure to put on insulating protective gear before beginning work on the high voltage system.



### CAUTION:

When lowering the PDM (Power Delivery Module) cover, be careful not to contact the circuit board section.

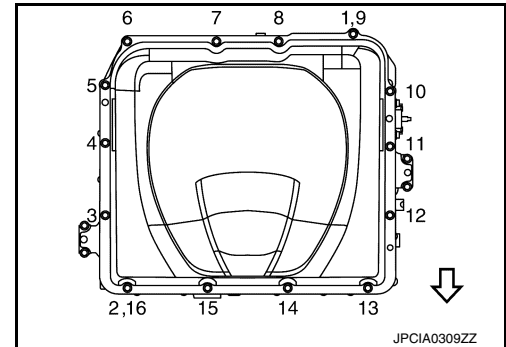
7. Tighten the mounting bolts in the order from 1 to 16 as shown in the figure.

← : Vehicle front

### WARNING:



Be sure to put on insulating protective gear before beginning work on the high voltage system.



### NOTE:

In the figure, 9 and 16 indicate the second tightening of 1 and 2.

8. Follow the procedure below and install the air leak tester attachment [SST: KV99112400].

### WARNING:



Be sure to put on insulating protective gear before beginning work on the high voltage system.



### NOTE:

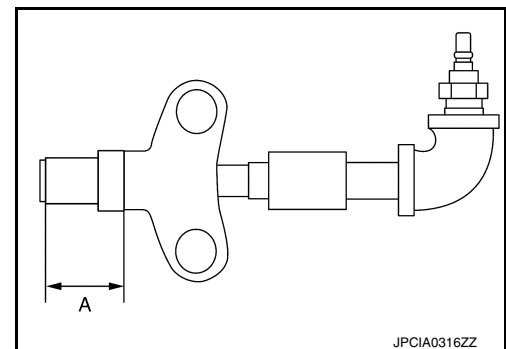
The air leak test is a check performed after PDM (Power Delivery Module) installation. However because it is difficult to install the attachment when the PDM is installed in the vehicle, install only the attachment before installing the PDM (Power Delivery Module) into the vehicle.

- Disconnect the breather.
- Adjust the length (A) of the attachment part to match the prescribed value.

**Standard : 20 mm ( 0.79 in )**

### CAUTION:

Be sure to check because this is the reference for screwing in the attachment.



- Insert the attachment (A) at the location where the breather is disconnected.

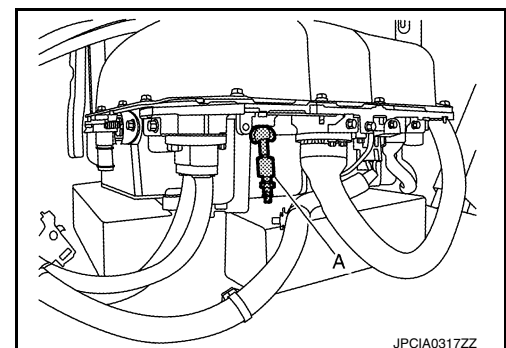
### NOTE:

Check that it is inserted securely all the way.

- Rotate the wing screw 5 times in the tightening direction (clockwise).

### NOTE:

Although the screw can be rotated more than 5 in the tightening direction, it is not necessary to further tighten it when the air leak test is performed.



# PDM(POWER DELIVERY MODULE)

## < REMOVAL AND INSTALLATION >

### Inspection

INFOID:000000009353571

#### INSPECTION AFTER INSTALLATION

##### Air Leak Inspection

##### CAUTION:

- Install the attachment before installing the PDM (Power Delivery Module).
- To prevent leakage of air, check that each harness is securely installed.

1. Install the air leak checker [SST: KV9911400 (J-50378)] onto the attachment.

##### WARNING:

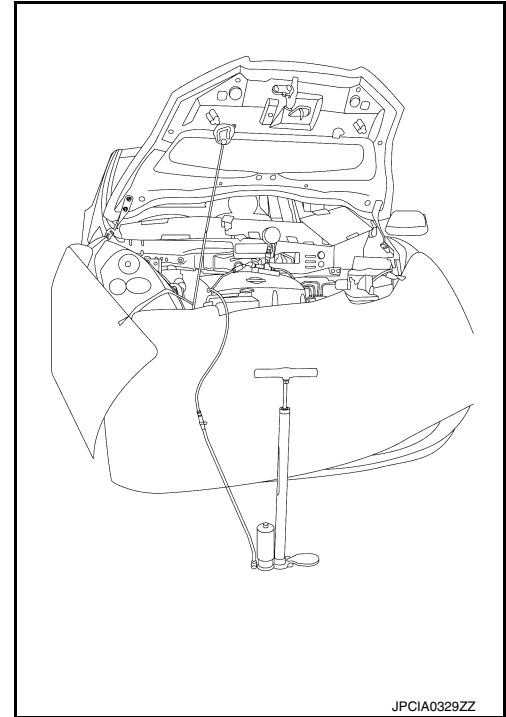


In order to prevent electric shock, be sure to wear insulated protective gear.



##### CAUTION:

The gauge is a precision instrument. Be careful not to drop it when handling it.



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2. Follow the procedure below and perform the pressure inspection.

##### WARNING:



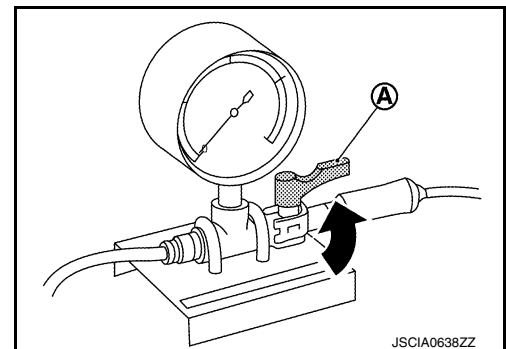
To prevent electric shock, wear insulated protective gear.



- a. Open the cock (A) on the pressure inspection gauge.

##### CAUTION:

Do not operate the pump before opening the stopcock on the pressure inspection gauge. Doing so may damage the gauge. If the pump is operated before the stopcock is opened, first disconnect the air pump hose to release the pressure.



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- b. Operate the air pump slowly and apply the specified inspection pressure inside the PDM (Power Delivery Module). If the gauge pressure does not rise, or if the gauge reading fluctuates, check for the location of air leakage.

**Prescribed inspection pressure : 20.0 kPa (0.2039 kg/cm<sup>2</sup>)**

##### CAUTION:

## PDM(POWER DELIVERY MODULE)

### < REMOVAL AND INSTALLATION >

- Operate the air pump carefully when applying pressure. If pressure is applied suddenly to the gauge, the gauge may be damaged.

- c. Close the cock and wait for 30 minutes.
- d. Check that the pressure inspection gauge reading remains at or above the limit value.

**Repair limit** : 19.8 kPa (0.2019 kg/cm<sup>2</sup>)

- e. If the pressure is below the limit value, check for the locations of air leakage.

#### NOTE:

Check for air leakage from the sound of air escaping when pressure is applied.

3. If it is confirmed that airtightness is maintained, remove the pressure inspection gauge and remove the attachment from the PDM (Power Delivery Module).

#### WARNING:



Be sure to put on insulating protective gear before beginning work on the high voltage system.



4. Install the breather.

#### Electric Equipotential Test

- Check the resistance between the PDM (Power Delivery Module) (aluminum part) and the body (ground bolt).
- Check the resistance between the PDM (Power Delivery Module) (aluminum part) and other high-voltage part (housing or conducting part).

#### WARNING:



Be sure to put on insulating protective gear before beginning work on the high voltage system.



**Standard** : Less than 0.1Ω

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.

# QUICK CHARGE PORT

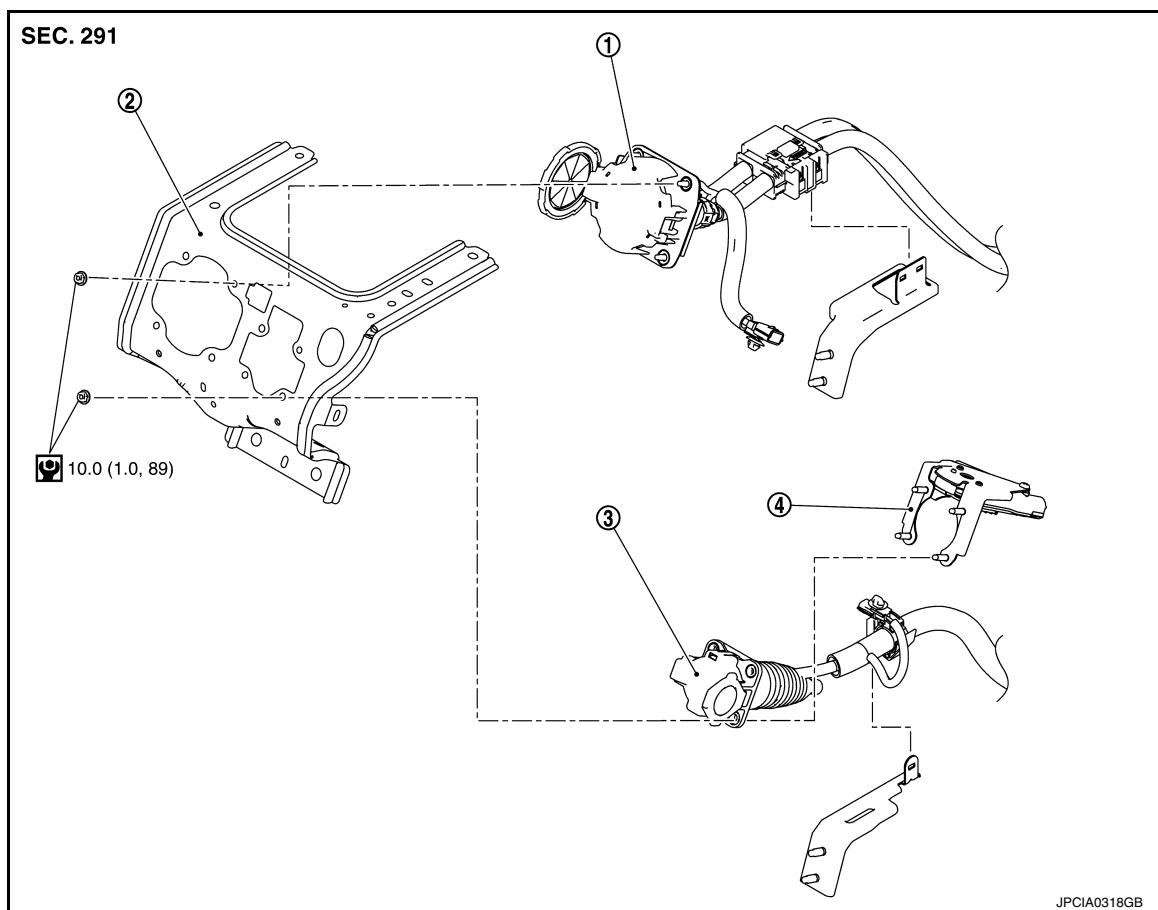
< REMOVAL AND INSTALLATION >

## QUICK CHARGE PORT

Exploded View

INFOID:000000008746515

### REMOVAL




① Quick charge port

② Charge port bracket

③ Normal charge port

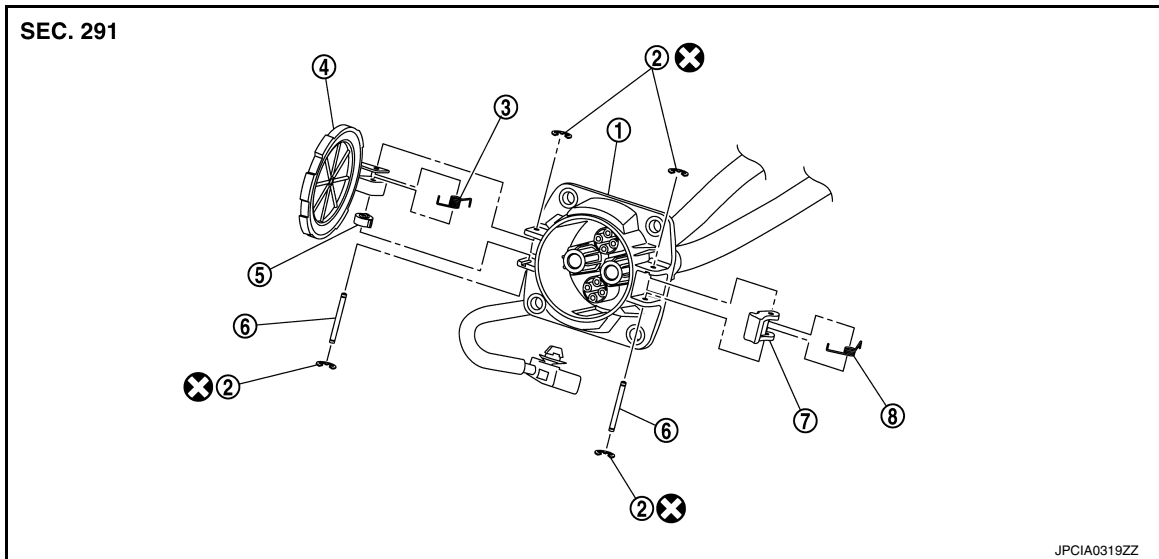
④ Charge connector lock actuator

 : N·m (kg-m, in-lb)

### DISASSEMBLY

# QUICK CHARGE PORT

## < REMOVAL AND INSTALLATION >



- |                     |                  |                  |
|---------------------|------------------|------------------|
| ① Quick charge port | ② Clip           | ③ Spring (large) |
| ④ Port cap          | ⑤ Damper         | ⑥ Pin            |
| ⑦ Lever             | ⑧ Spring (small) |                  |

⊗ : Always replace after every disassembly.

## Removal and Installation

INFOID:000000008746516

### **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 [VC-6, "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:**

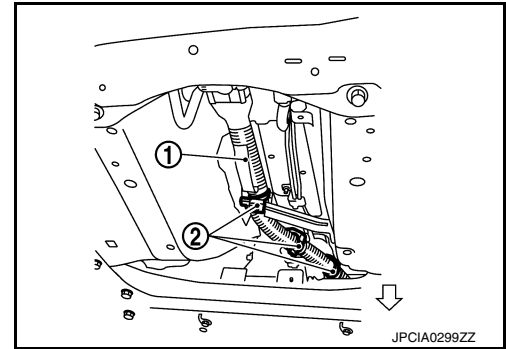
Disconnect high voltage. Refer to [GI-33, "How to Disconnect High Voltage"](#).

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-194, "Exploded View"](#).

## QUICK CHARGE PORT

### < REMOVAL AND INSTALLATION >

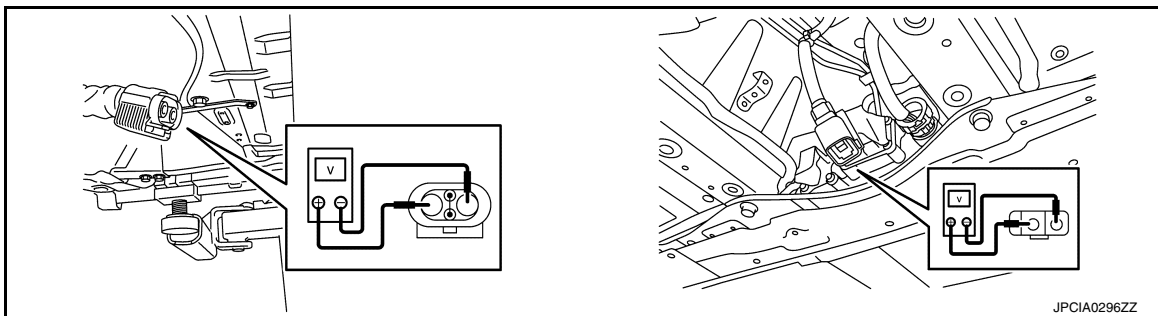
- b. Remove high voltage harness ① from clamp ②.



- c. Disconnect high voltage harness connector and high voltage harness for PTC heater from front side of Li-ion battery. Refer to [EVB-194, "Removal and Installation"](#).
- d. Measure voltage between high voltage harness connector terminals and high voltage harness connector terminals for PTC heater.

#### **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 the radiator upper grille. Refer to [DLK-180, "RADIATOR UPPER GRILLE : Removal and Installation"](#).
3. Remove the charge port lid inner cover. Refer to [DLK-173, "Exploded View"](#).

#### **WARNING:**

 Be sure to put on insulating protective gear before beginning work on the high voltage system.



4. Remove the camera harness clamp, and disconnect the connectors on both the camera side and engine harness side.
5. Remove the charge port cover assembly together with the camera harness. Refer to [DLK-173, "Exploded View"](#).
6. Remove quick charge port mounting nuts.

#### **WARNING:**

 Be sure to put on insulating protective gear before beginning work on the high voltage system.



## QUICK CHARGE PORT

### < REMOVAL AND INSTALLATION >

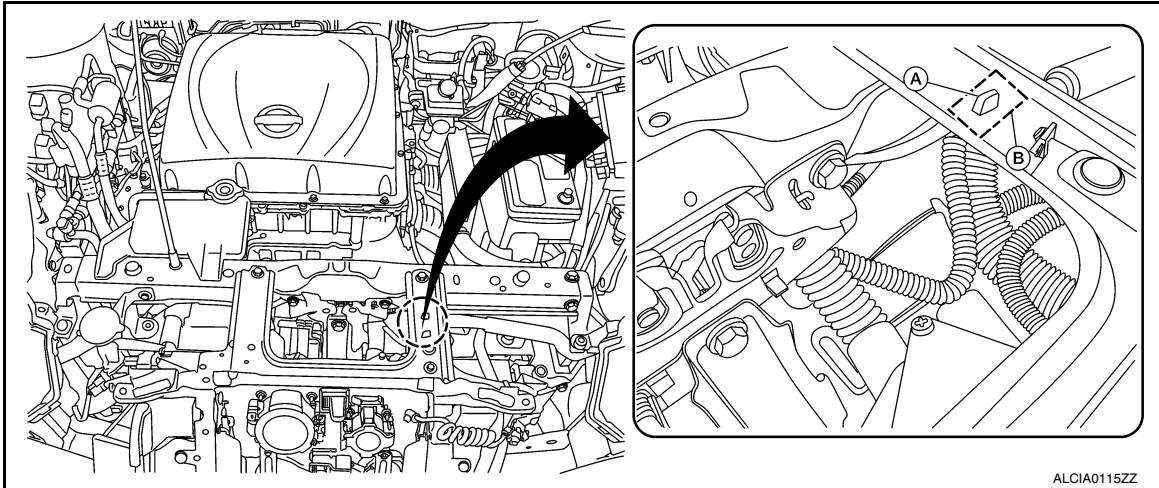


7. Remove the quick charge port harness connector clamp ① from the bracket, then remove the quick charge port harness connector ②.

**WARNING:**



Be sure to put on insulating protective gear before beginning work on the high voltage system.

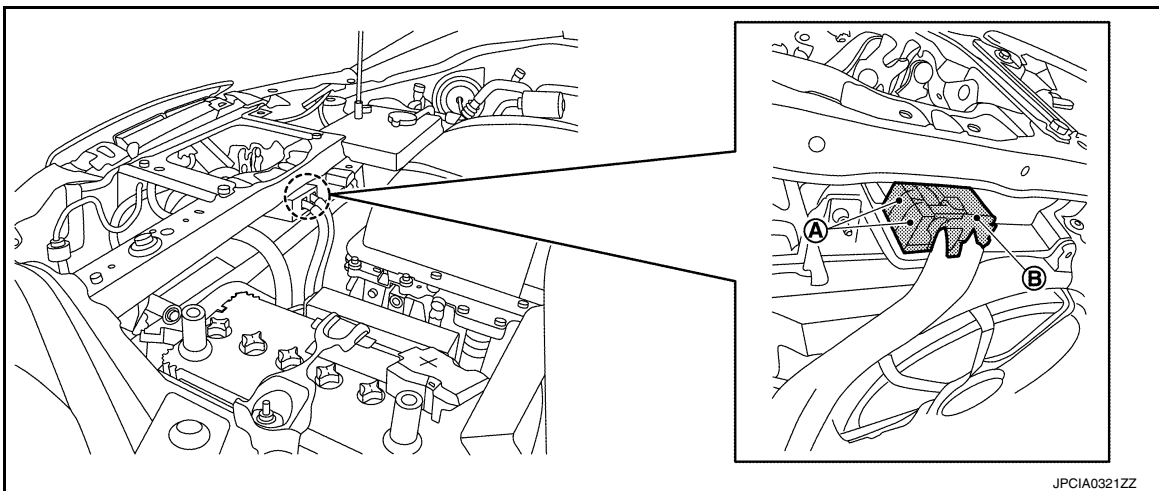


8. Remove the quick charge port harness clamp from the bracket.
- Radiator core support upper side
  - Press the 2 tabs ① while removing the harness clamp ②.

**WARNING:**



Be sure to put on insulating protective gear before beginning work on the high voltage system.



- Inverter side
- Press the 2 tabs ① while removing the harness clamp ②.

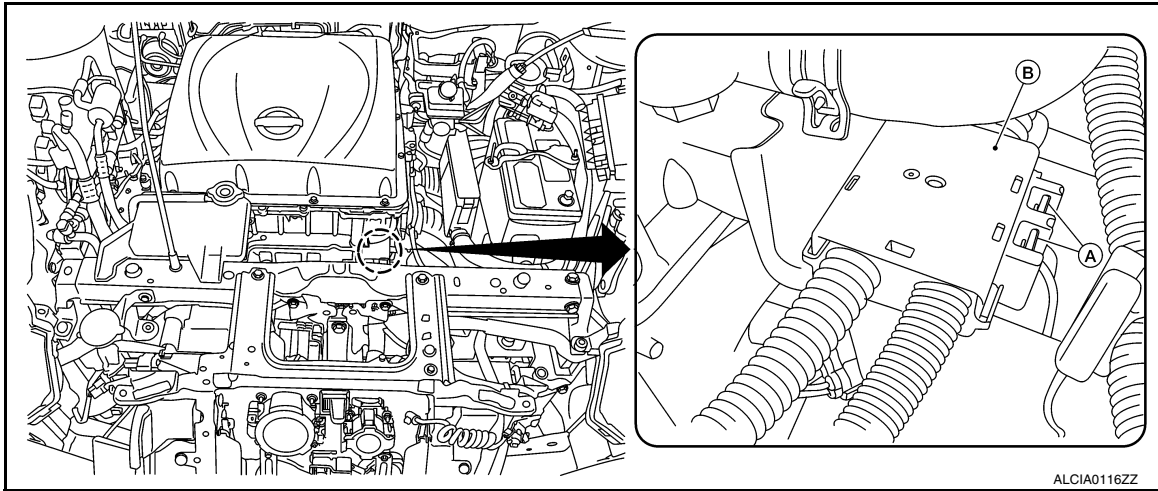
**WARNING:**

## QUICK CHARGE PORT

### < REMOVAL AND INSTALLATION >



Be sure to put on insulating protective gear before beginning work on the high voltage system.



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9. Pull out the quick charge port toward the rear of the vehicle.

#### **WARNING:**



Be sure to put on insulating protective gear before beginning work on the high voltage system.



10. Remove the PDM (Power Delivery Module) before removing the quick charge port. Refer to [VC-119, "Removal and Installation"](#).

#### **WARNING:**



Be sure to put on insulating protective gear before beginning work on the high voltage system.



## INSTALLATION

To install, be careful to the following items and follow procedure in the reverse order of removal.

#### **WARNING:**



Be sure to put on insulating protective gear before beginning work on the high voltage system.



#### **CAUTION:**

Be sure to reinstall high-voltage harness clips in their original positions. If a clip is damaged, replace it with a new clip before installing.

## Disassembly and Assembly

INFOID:0000000008746517

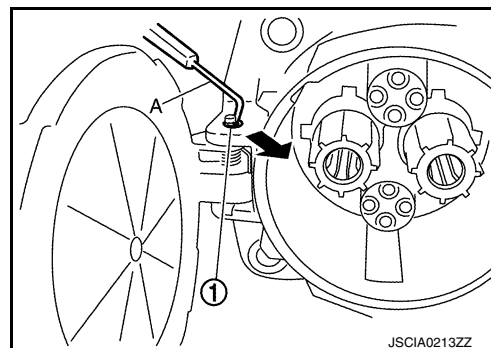
## DISASSEMBLY

Cover Side

## QUICK CHARGE PORT

### < REMOVAL AND INSTALLATION >

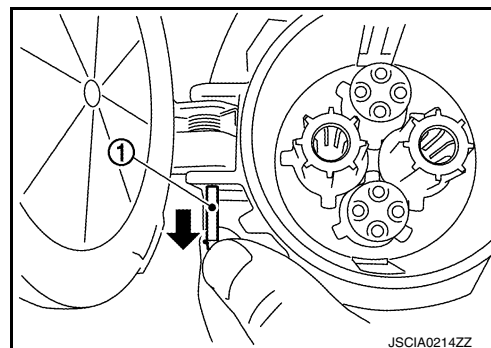
1. Use a suitable tool (A) to remove the clip ① that is attached to the pin.



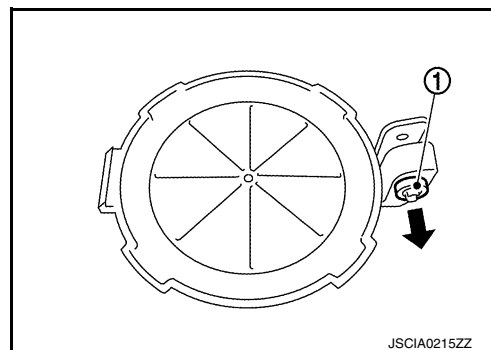
2. Pull out pin ① of charge port cover.

**CAUTION:**

When pin is pulled out, the spring will also jump out. Take care not to lose it.

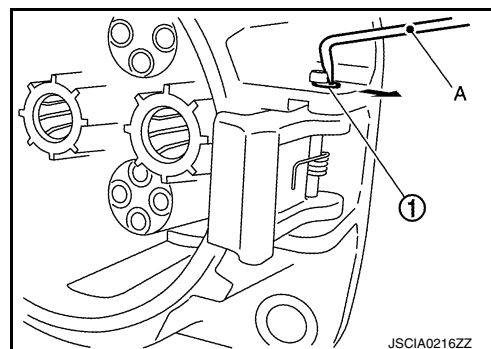


3. Remove damper ① from charge port cover.



### Lever Side

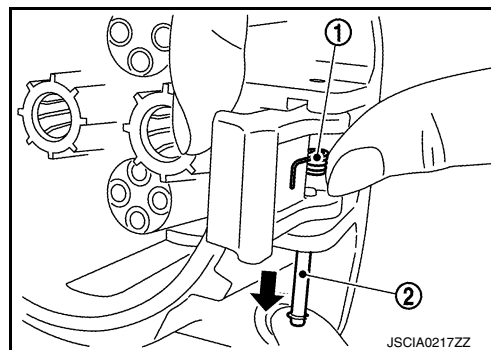
1. Use a suitable tool (A) to remove the clip ① that is attached to the pin.



## QUICK CHARGE PORT

### < REMOVAL AND INSTALLATION >

2. Press while removing pin ② to ensure that spring ① does not jump out, then remove lever.



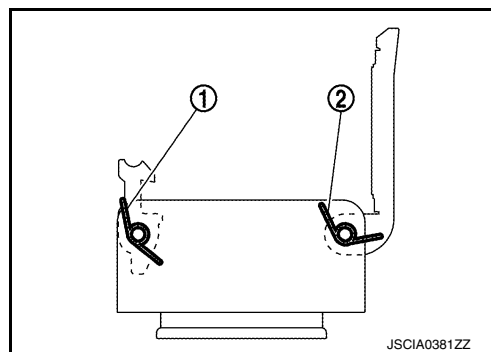
### ASSEMBLY

Note the following, and assemble in the reverse order of disassembly.

#### CAUTION:

- Never reuse the clips.
- Pay attention to direction that cover side damper is facing.
- Pay attention to direction that spring is facing.

- ① : Spring (small)  
② : Spring (large)



# NORMAL CHARGE PORT

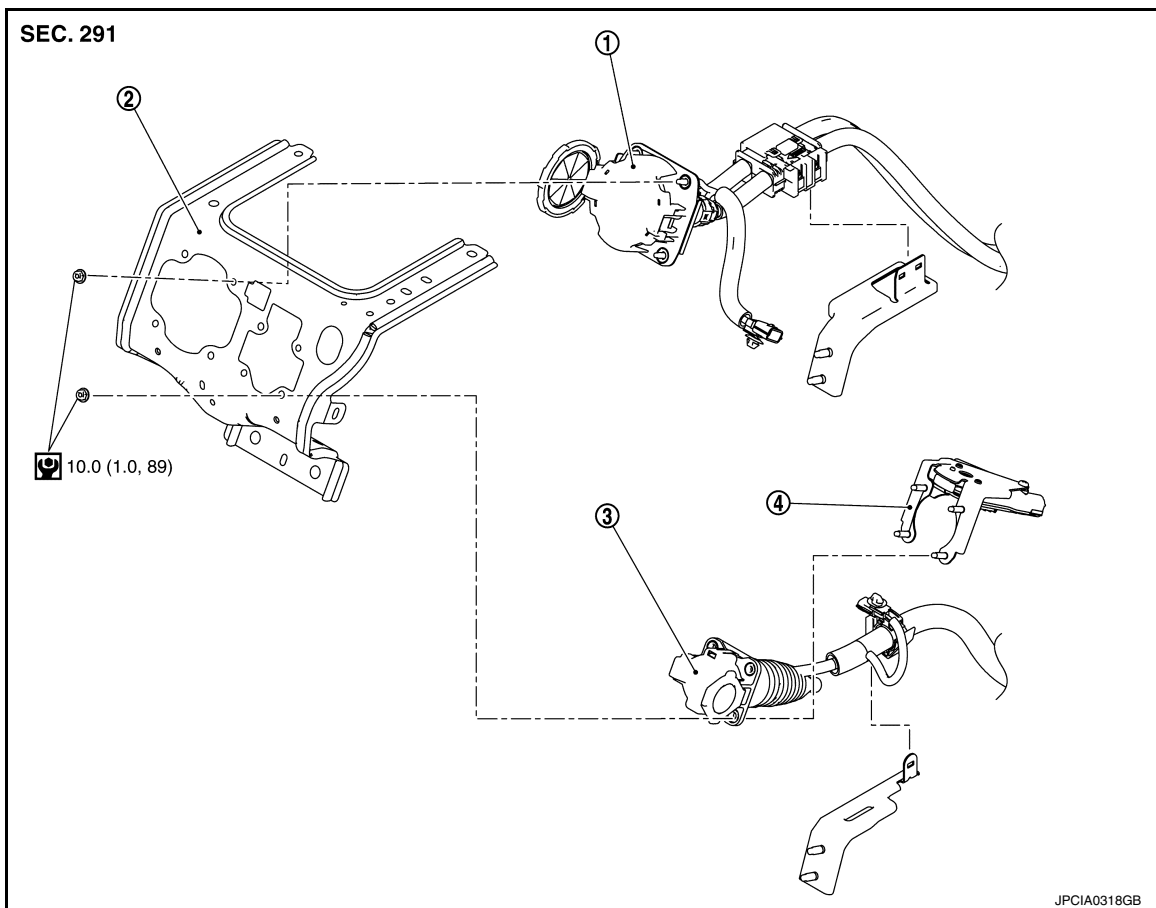
< REMOVAL AND INSTALLATION >

## NORMAL CHARGE PORT

Exploded View

INFOID:000000008746518

### REMOVAL




① Quick charge port

② Charge port bracket

③ Normal charge port

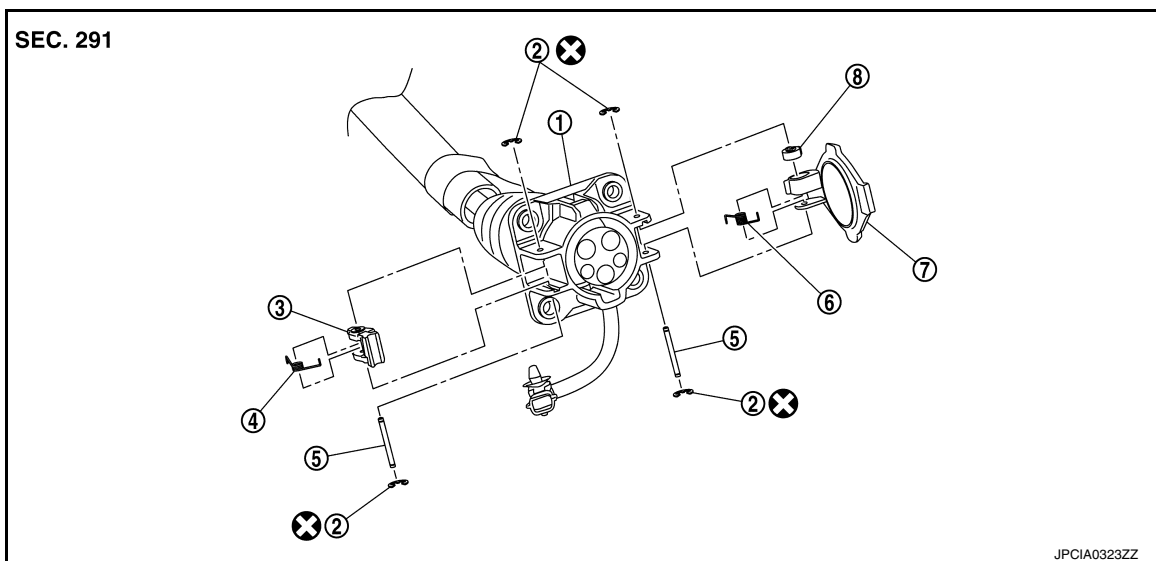
④ Charge connector lock actuator

 : N·m (kg-m, in-lb)

### DISASSEMBLY

## NORMAL CHARGE PORT

### < REMOVAL AND INSTALLATION >



① Normal charge port

② Clip

③ Lever

④ Spring (small)

⑤ Pin

⑥ Spring (large)

⑦ Port cap

⑧ Damper

⊗ : Always replace after every disassembly.

### Removal and Installation

INFOID:000000008746519

#### **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 [VC-6, "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 high voltage. Refer to [GI-33, "How to Disconnect High Voltage"](#).

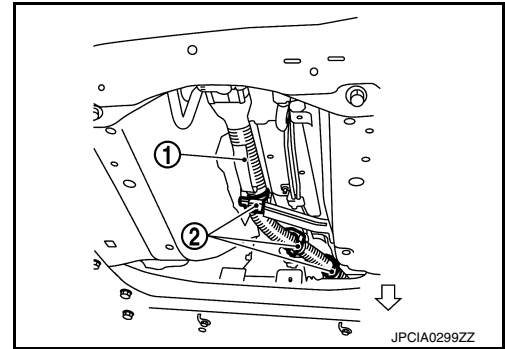
1. Check voltage in high voltage circuit. (Check that condenser are discharged.)
  - a. Lift up the vehicle and remove the Li-ion battery under covers. Refer to [EVB-194, "Exploded View"](#).

## NORMAL CHARGE PORT

### < REMOVAL AND INSTALLATION >

- b. Remove high voltage harness ① from clamp ②.

⇐ : Vehicle front

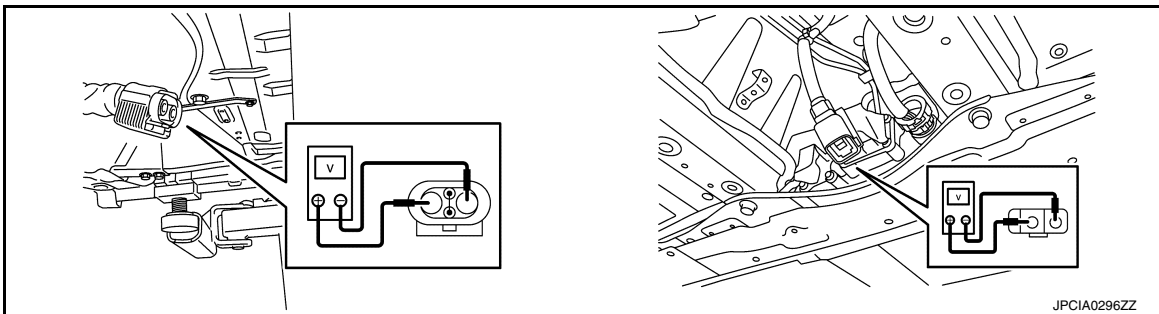


- c. Disconnect high voltage harness connector and high voltage harness for PTC heater from front side of Li-ion battery. Refer to [EVB-194, "Removal and Installation"](#).
- d. Measure voltage between high voltage harness connector terminals and high voltage harness connector terminals for PTC heater.

#### **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 radiator upper grille. Refer to [DLK-180, "RADIATOR UPPER GRILLE : Removal and Installation"](#).
3. Disconnect the normal charge port harness connector.

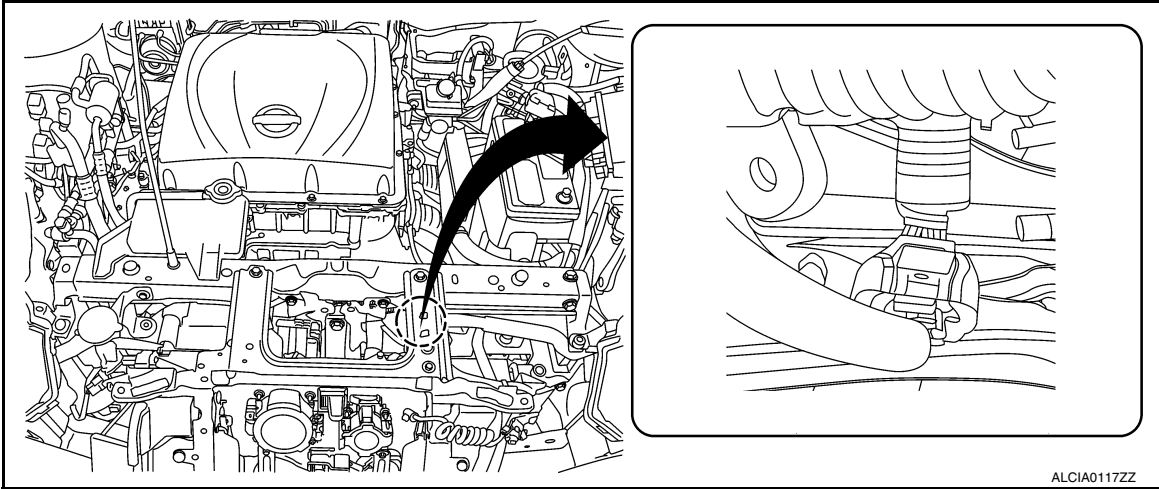
#### **WARNING:**



Be sure to put on insulating protective gear before beginning work on the high voltage system.

## NORMAL CHARGE PORT

### < REMOVAL AND INSTALLATION >

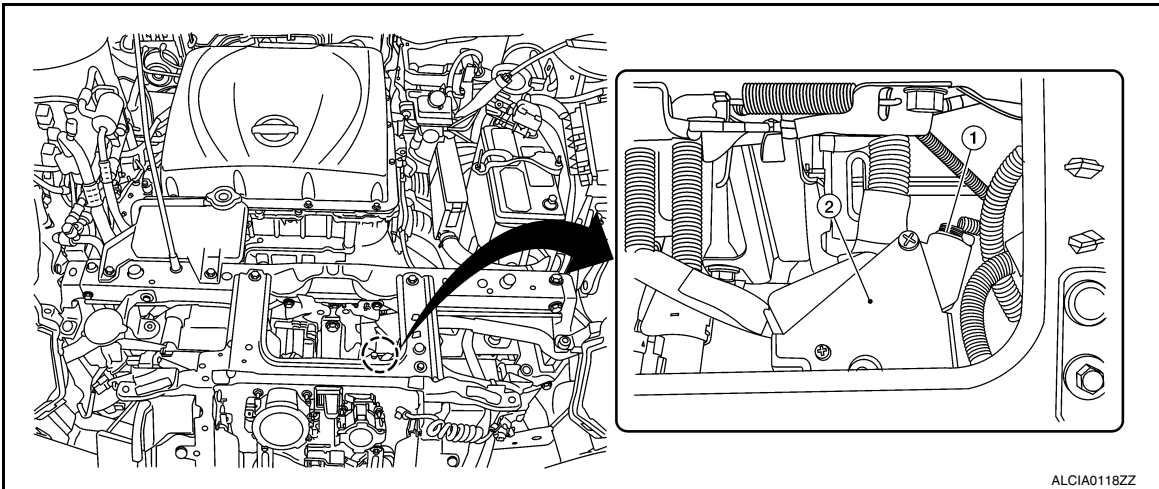


4. Disconnect the charge connector lock actuator (2) harness connector (1).

**WARNING:**



Be sure to put on insulating protective gear before beginning work on the high voltage system.



5. Remove the normal charge port harness clamps from the brackets.
- Radiator core support upper side
  - Press the tab (A) while removing the harness clamp.

**WARNING:**

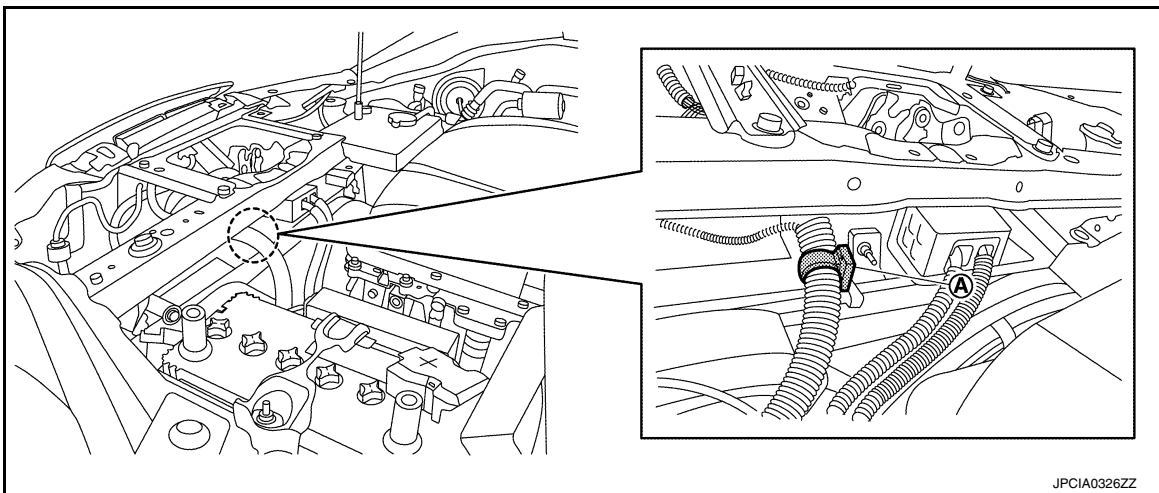


Be sure to put on insulating protective gear before beginning work on the high voltage system.



## NORMAL CHARGE PORT

### < REMOVAL AND INSTALLATION >

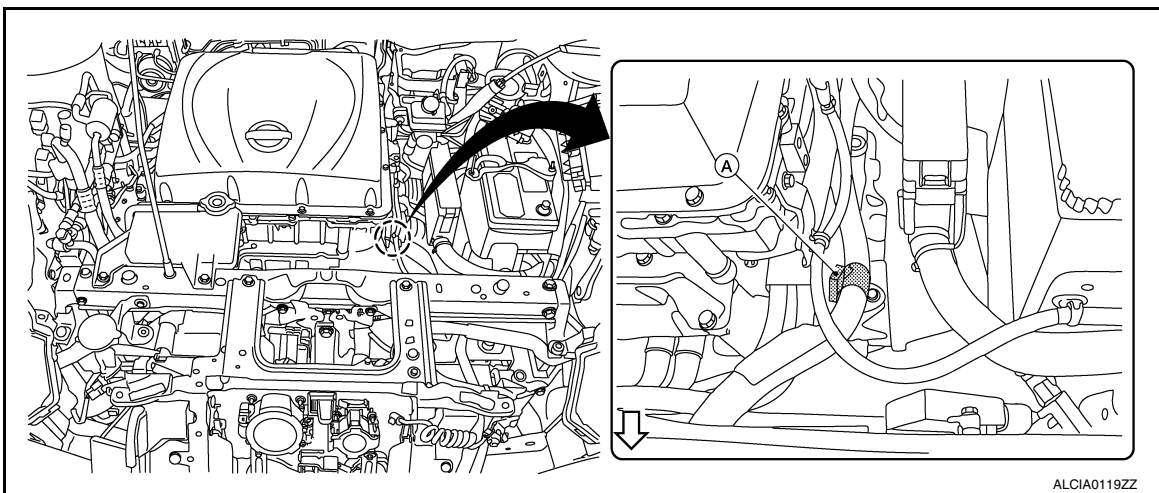


- Inverter side
- Press the tab ① while removing the harness clamp.

#### **WARNING:**



Be sure to put on insulating protective gear before beginning work on the high voltage system.



6. Remove the normal charging port mounting nuts.

#### **WARNING:**



Be sure to put on insulating protective gear before beginning work on the high voltage system.



7. Remove the charge connector lock actuator.

#### **WARNING:**



Be sure to put on insulating protective gear before beginning work on the high voltage system.

## NORMAL CHARGE PORT

### < REMOVAL AND INSTALLATION >



8. Pull out the normal charge port toward the rear of the vehicle.

#### **WARNING:**



Be sure to put on insulating protective gear before beginning work on the high voltage system.



9. Remove the PDM (Power Delivery Module) before removing the normal charge port. Refer to [VC-142, "Removal and Installation"](#).

#### **WARNING:**



Be sure to put on insulating protective gear before beginning work on the high voltage system.



### INSTALLATION

Install in the reverse order of removal.

#### **WARNING:**



Be sure to put on insulating protective gear before beginning work on the high voltage system.



#### **CAUTION:**

Be sure to reinstall high-voltage harness clips in their original positions. If a clip is damaged, replace it with a new clip before installing.

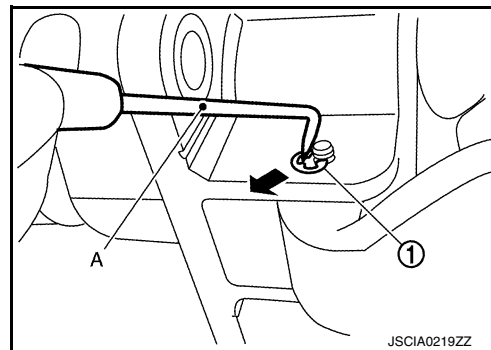
### Disassembly and Assembly

INFOID:000000008746520

### DISASSEMBLY

#### Cover Side

1. Use a suitable tool (A) to remove the clip ① that is attached to the pin.



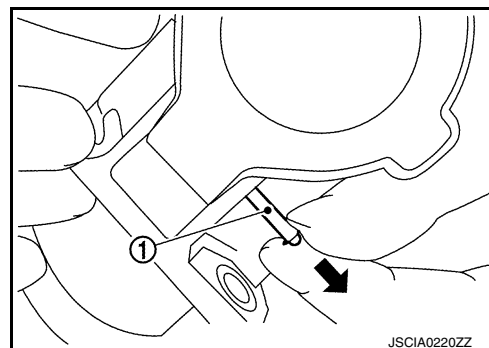
## NORMAL CHARGE PORT

### < REMOVAL AND INSTALLATION >

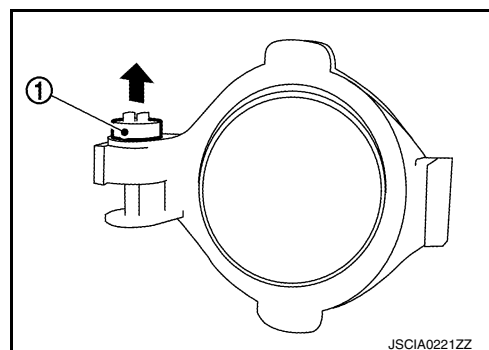
2. Pull out pin ① of charge port cover.

**CAUTION:**

When pin is pulled out, the spring will also jump out. Take care not to lose it.

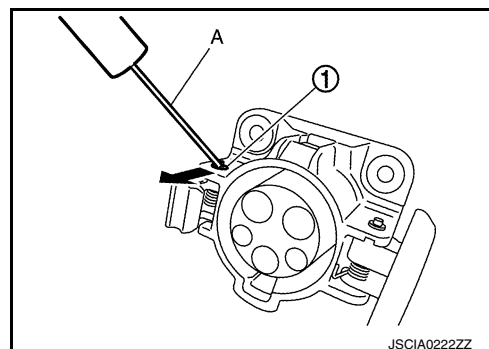


3. Remove damper ① from charge port cover.

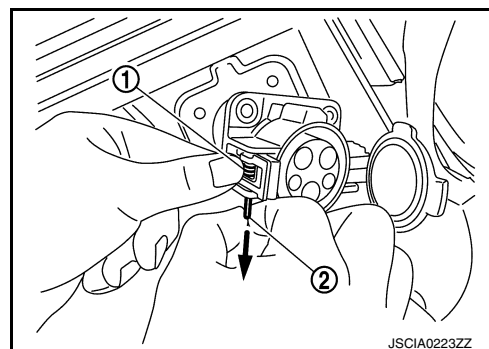


#### Lever Side

1. Use a suitable tool (A) to remove the clip ① that is attached to the pin.



2. Press while removing pin ② to ensure that spring ① does not jump out, then remove lever.



#### ASSEMBLY

Note the following, and assemble in the reverse order of disassembly.

**CAUTION:**

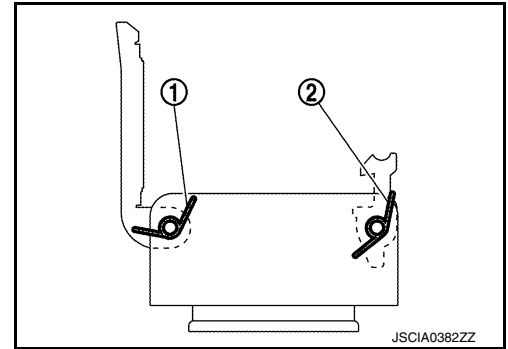
- Never reuse the clips.
- Pay attention to direction that cover side damper is facing.

## NORMAL CHARGE PORT

### < REMOVAL AND INSTALLATION >

- Pay attention to direction that spring is facing.

- ① : Spring (large)
- ② : Spring (small)



# CHARGE CONNECTOR LOCK ACTUATOR

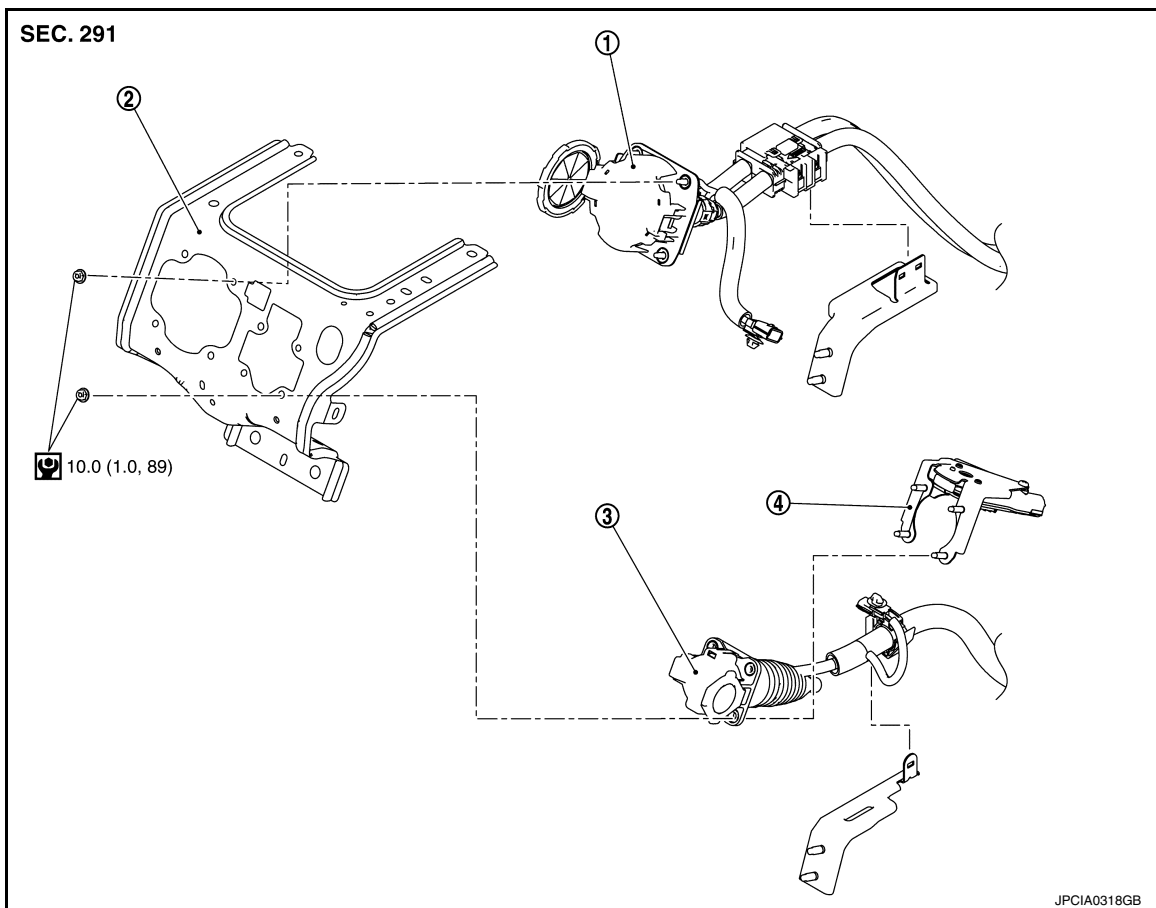
< REMOVAL AND INSTALLATION >

## CHARGE CONNECTOR LOCK ACTUATOR

Exploded View

INFOID:000000009298361

### REMOVAL




① Quick charge port

② Charge port bracket

③ Normal charge port


④ Charge connector lock actuator

 : N·m (kg-m, in-lb)

### Removal and Installation

INFOID:000000009298360

#### **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.

# CHARGE CONNECTOR LOCK ACTUATOR

## < REMOVAL AND INSTALLATION >

- Refer to [VC-6, "High Voltage Precautions"](#).

### CAUTION:

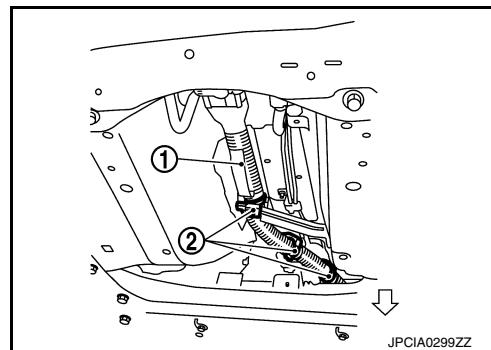
Never bring the vehicle into the READY status with the service plug removed unless otherwise instructed in the Service Manual. A malfunction may occur if this is not observed.

### REMOVAL

### WARNING:


Disconnect high voltage. Refer to [GI-33, "How to Disconnect High Voltage"](#).

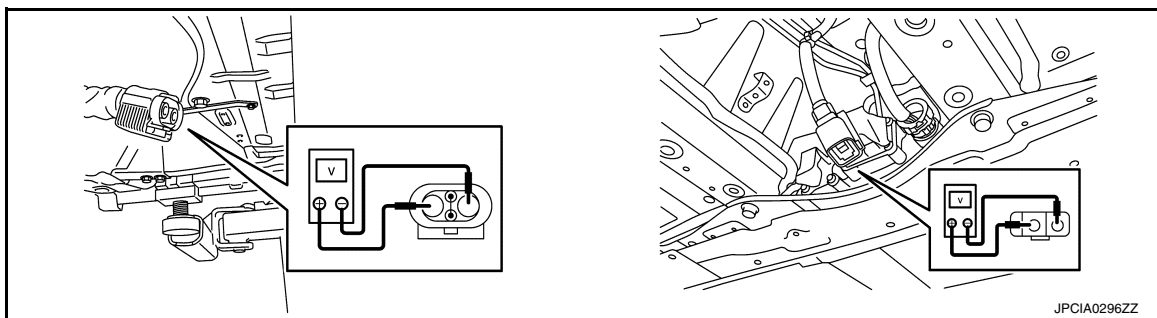
1. Check voltage in high voltage circuit. (Check that condenser are discharged.)
  - a. Lift up the vehicle and remove the Li-ion battery under covers. Refer to [EVB-194, "Exploded View"](#).
  - b. Remove high voltage harness ① from clamp ②.



- c. Disconnect high voltage harness connector and high voltage harness for PTC heater from front side of Li-ion battery. Refer to [EVB-194, "Removal and Installation"](#).
- d. Measure voltage between high voltage harness connector terminals and high voltage harness connector terminals for PTC heater.

### DANGER:

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



Standard

: 5 V or less

### CAUTION:

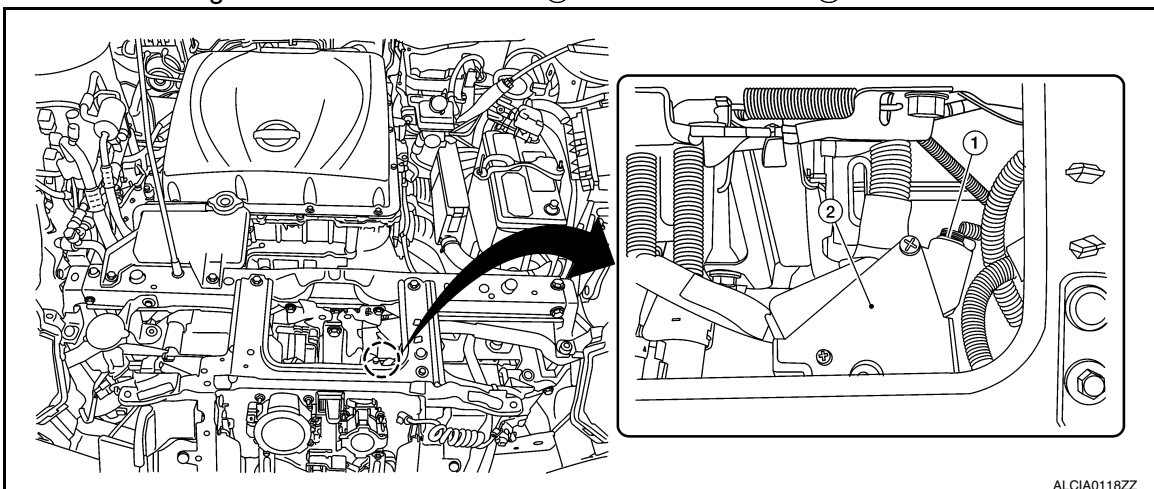
For voltage measurements, use a tester which can measure to 500 V or higher.

2. Remove the radiator upper grille. Refer to [DLK-180, "RADIATOR UPPER GRILLE : Removal and Installation"](#).

## CHARGE CONNECTOR LOCK ACTUATOR

### < REMOVAL AND INSTALLATION >

3. Disconnect the charge connector lock actuator ② harness connector ①.



4. Remove the normal charging port mounting nuts.  
5. Remove the charge connector lock actuator.

### INSTALLATION

Install in the reverse order of removal.

#### **WARNING:**



Be sure to put on insulating protective gear before beginning work on the high voltage system.



#### **CAUTION:**

Be sure to reinstall high-voltage harness clips in their original positions. If a clip is damaged, replace it with a new clip before installing.

# IMMEDIATE CHARGING SWITCH

< REMOVAL AND INSTALLATION >

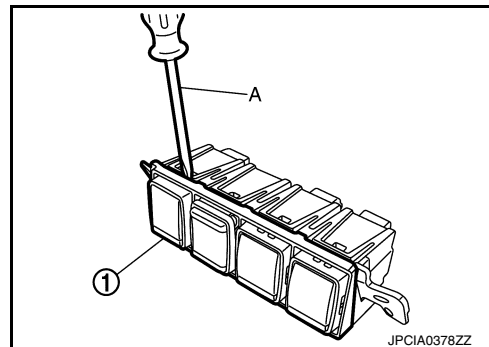
## IMMEDIATE CHARGING SWITCH

### Removal and Installation

INFOID:000000008746521

#### REMOVAL

1. Remove instrument lower panel LH. Refer to [IP-16. "Exploded View"](#).
2. Remove switch panel assembly from instrument lower panel LH.
3. Remove immediate charging switch ① from switch panel using a suitable tool (A).



#### INSTALLATION

Install in the reverse order of removal.



## CHARGE CONNECTOR LOCK SWITCH

< REMOVAL AND INSTALLATION >

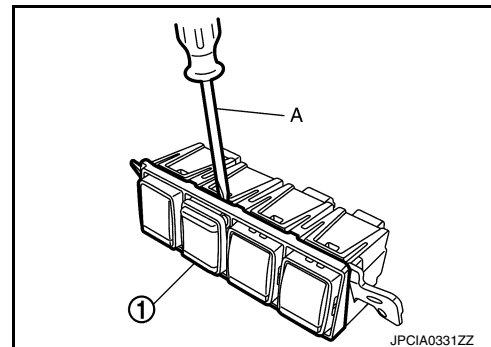
### CHARGE CONNECTOR LOCK SWITCH

#### Removal and Installation

INFOID:000000009298366

#### REMOVAL

1. Remove instrument lower panel LH. Refer to [IP-16, "Exploded View"](#).
2. Remove switch panel assembly from instrument lower panel LH.
3. Remove charge connector lock switch ① from switch panel using a suitable tool (A).



#### INSTALLATION

Install in the reverse order of removal.

# CHARGING STATUS INDICATOR

< REMOVAL AND INSTALLATION >

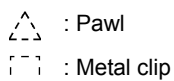
## CHARGING STATUS INDICATOR

### Removal and Installation

INFOID:000000008746522

#### REMOVAL

1. Remove charging status indicator.
  1. Apply protective tape (A) on the part to protect it from damage.
2. Insert remover tool (A) between charging status indicator and instrument panel assembly to disengage the pawl and metal clips as shown in the figure.
3. Pull toward the arrow direction.
4. Disconnect harness connector.



#### CAUTION:

Apply shop cloth or take similar steps at location of tool fulcrum, and take care that no scratches or dents are made.

#### INSTALLATION

Position clips, and then press each into the instrument panel to fasten clips in place.

