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SECTION EVB

EV BATTERY SYSTEM

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PRECAUTIONS

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Normal Charge Precaution

INFOID:000000007081704

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 on board charger at normal charge operation may effect medical electric devices, a technician using a medical electric device such as implantable cardiac pacemaker or an implantable cardioverter defibrillator must not enter the vehicle compartment (including luggage room) during normal charge operation.

Point to Be Checked Before Starting Maintenance Work

INFOID:000000007081705

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:000000007005864

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

WARNING:

Always observe the following items for preventing accidental activation.

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

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

WARNING:

Always observe the following items for preventing accidental activation.

- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the power switch ON, never use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the power switch OFF, disconnect the 12V battery, and wait at least 3 minutes before performing any service.

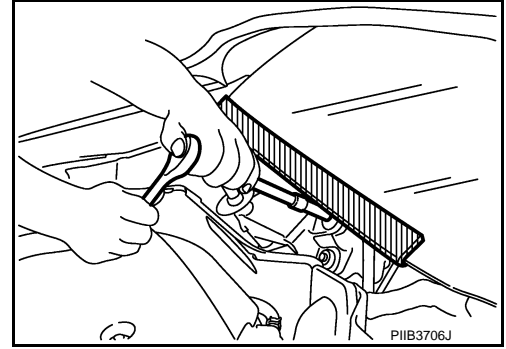
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Precaution for Procedure without Cowl Top Cover

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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.



Precaution for Removing 12V Battery

INFOID:000000007005861

When removing the 12V battery, turn ON/OFF the power switch and check that the charging status indicator does not blink. The 12V battery must be removed within one hour after checking the indicator lamp.

NOTE:

- The automatic 12V battery charge control may start even when the power switch is in OFF state.
- The automatic 12V battery charge control does not start within approximately one hour when the power switch is turned ON/OFF.

High Voltage Precautions

INFOID:000000007005713

WARNING:

- Because 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.
- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.
- Be sure to wear insulating protective equipment consisting of glove, shoes and face shield before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.

CAUTION:

There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.

HIGH VOLTAGE HARNESS AND EQUIPMENT IDENTIFICATION

The colors of the high voltage harnesses and connectors are all orange. Orange "High Voltage" labels are applied to the Li-ion battery and other high voltage devices. Do not carelessly touch these harnesses and 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 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

Because this vehicle uses components that contain high voltage and powerful magnetism, do not carry any metal products which may cause short circuits, or any magnetic media (cash cards, prepaid cards, etc.) which may be damaged on your person when working.

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POSTING A SIGN OF "DANGER! HIGH VOLTAGE AREA. KEEP OUT"

To call the attention of other workers, indicate "High voltage work in progress. Do not touch!" on vehicles where work is being performed on the high voltage systems.

<p>Person in charge: _____</p> <p>CAUTION: HIGH VOLTAGE. DO NOT TOUCH DURING OPERATION.</p>
<p>CAUTION: HIGH VOLTAGE. DO NOT TOUCH DURING OPERATION.</p> <p>Person in charge: _____</p>
<p>Copy this page and put it after folding on the roof of the vehicle in service.</p> <p style="text-align: right;"><small>JSAIA0091GB</small></p>

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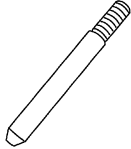
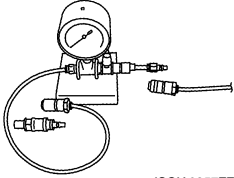
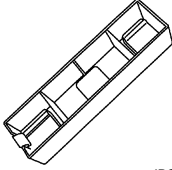
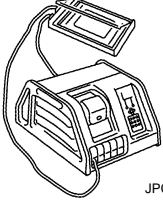
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Special Service Tools

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Tool name Tool number (Kent-Moore No.)		Description
Battery location guide pin KV99111300 (J-50306)	 <p>JPCIA0023ZZ</p>	Installing high voltage components 2 piece/set
Air leak checker KV99111400 (—)	 <p>JSCIA0257ZZ</p>	Air leak check after battery pack is resolved
Module terminal cover KV99111500 (—)	 <p>JPCIA0069ZZ</p>	Protect module terminals (for LEAF) 24 pieces/set
Module charge balancer — (J-50346)	 <p>JPCIA0070ZZ</p>	Module voltage adjustment

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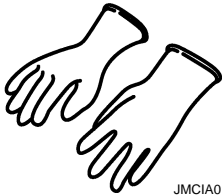
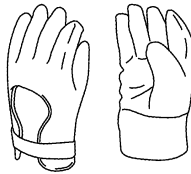

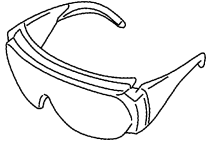
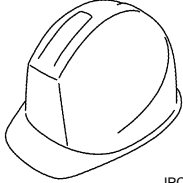
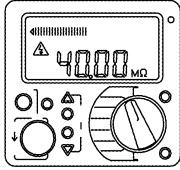
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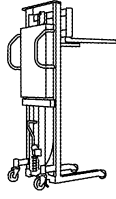
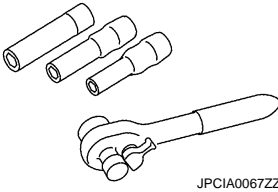
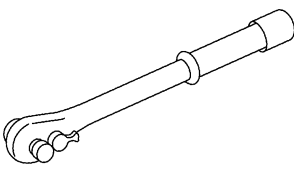
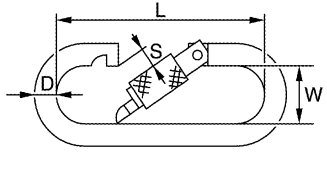
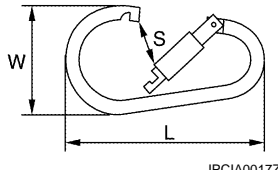
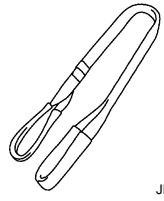
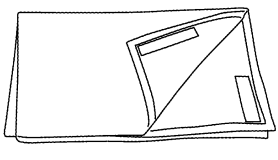
Commercial Service Tools

INFOID:000000007063822

Tool name		Description
<p>Insulated gloves [Guaranteed insulation performance for 1000V/300A]</p>	 <p>JMCIA0149ZZ</p>	<p>Removing and installing high voltage components</p>
<p>Leather gloves [Use leather gloves that can fasten the wrist tight]</p>	 <p>JPCIA0066ZZ</p>	<ul style="list-style-type: none"> • Removing and installing high voltage components • Protect insulated gloves
<p>Insulated safety shoes</p>	 <p>JPCIA0011ZZ</p>	<p>Removing and installing high voltage components</p>
<p>Safety glasses [ANSI Z87.1]</p>	 <p>JPCIA0012ZZ</p>	<ul style="list-style-type: none"> • Removing and installing high voltage components • To protect eye from the spatter on the work to electric line
<p>Insulated helmet</p>	 <p>JPCIA0013ZZ</p>	<p>Removing and installing high voltage components</p>
<p>Insulation resistance tester (Multi tester)</p>	 <p>JPCIA0014ZZ</p>	<p>Measuring voltage and insulation resistance</p>

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Tool name		Description
Stacker	 <p>JPCIA0015ZZ</p>	Removing and installing high voltage components
Insulated hand tools	 <p>JPCIA0067ZZ</p>	Removing and installing high voltage components
Insulated torque wrench	 <p>JPCIA0068ZZ</p>	Removing and installing high voltage components
Carabineer [small]	 <p>JPCIA0016ZZ</p>	Removing and installing battery module stack NOTE: D: 8.0 mm (0.31 in) L: 74.0 mm (2.91 in) S: 10.0 mm (0.39 in) W: 22.5 mm (0.89 in)
Carabineer [large]	 <p>JPCIA0017ZZ</p>	Removing and installing battery module stack NOTE: D: 14.0 mm (0.55 in) L: 204.0 mm (8.03 in) S: 47.0 mm (1.85 in) W: 105.0 mm (4.13 in)
Belt slinger	 <p>JPCIA0021ZZ</p>	Removing and installing battery module stack Length: 2.0 m (0.787 ft)
Insulated cover sheet	 <p>JPCIA0018ZZ</p>	Removing and installing high voltage components

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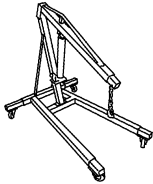
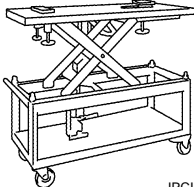
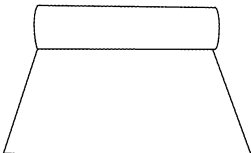
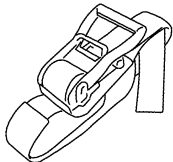
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Tool name		Description
Mobile floor crane	 <p>JPCIA0020ZZ</p>	Removing and installing battery module stack
Battery lift table	 <p>JPCIA0024ZZ</p>	Removing and installing Li-ion battery
Insulated rubber sheet	 <p>JPCIA0019ZZ</p>	Removing and installing high voltage components
Lashing belt	 <p>JPCIA0022ZZ</p>	Removing and installing battery rear module stack

COMPONENT PARTS

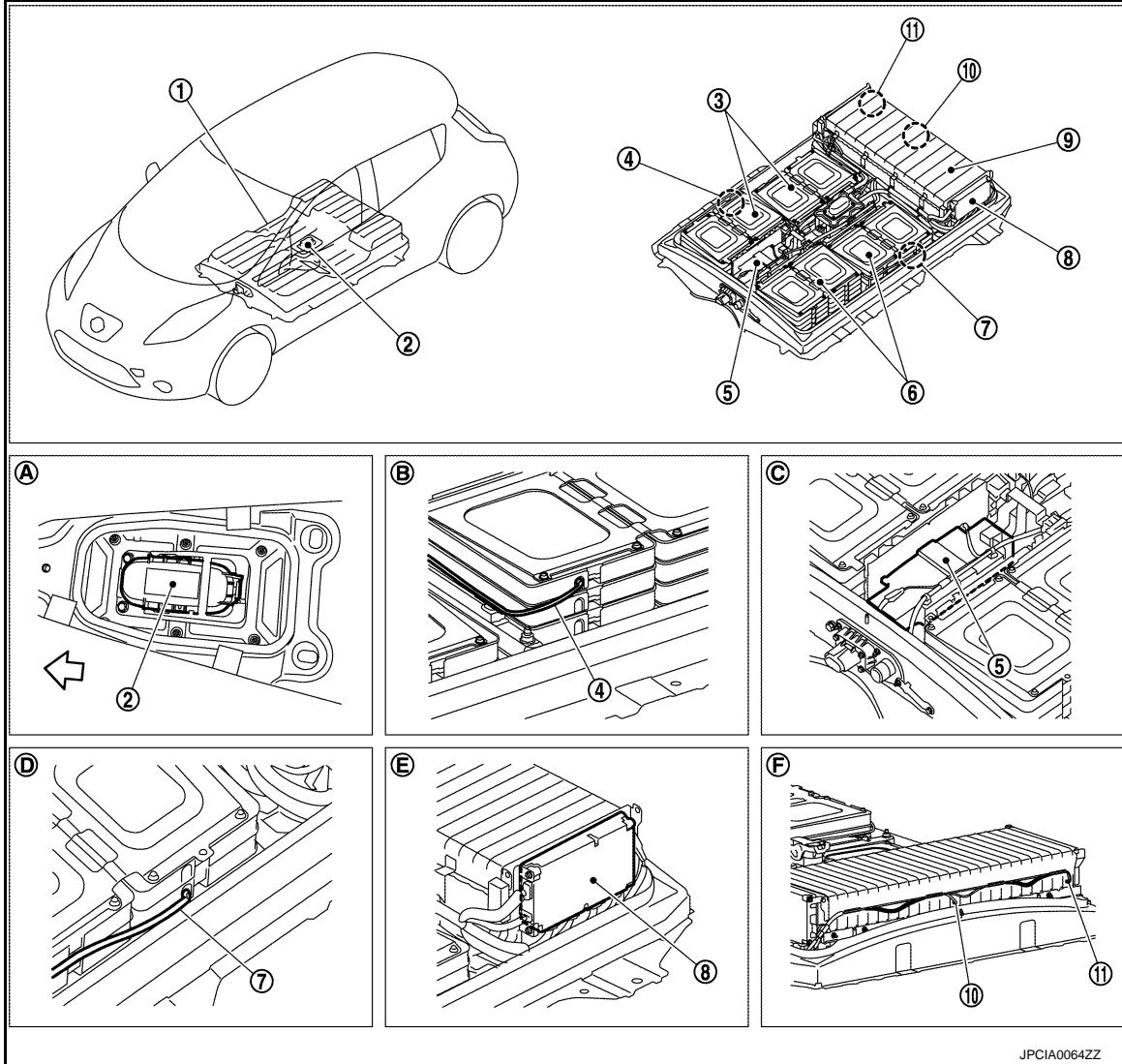
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SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

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- A. Center of rear seat legroom
 - B. Center of battery pack right side
 - C. Center of battery pack front side
 - D. Center of battery pack left side
 - E. Back of battery pack left side
 - F. Back of battery pack
- ↶ : Vehicle front

No.	Component	Function
1.	Li-ion battery	EVB-12, "Li-ion Battery"
2.	Service plug	EVB-14, "Service Plug"
3.	Front module stack RH	EVB-13, "Module"
4.	Battery temperature sensor (Front RH)	EVB-14, "Battery Temperature Sensor"
5.	Battery junction box	EVB-14, "Battery Junction Box"
6.	Front module stack LH	EVB-13, "Module"
7.	Battery temperature sensor (Front LH)	EVB-14, "Battery Temperature Sensor"
8.	Li-ion battery controller	EVB-12, "Li-ion Battery Controller"

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COMPONENT PARTS

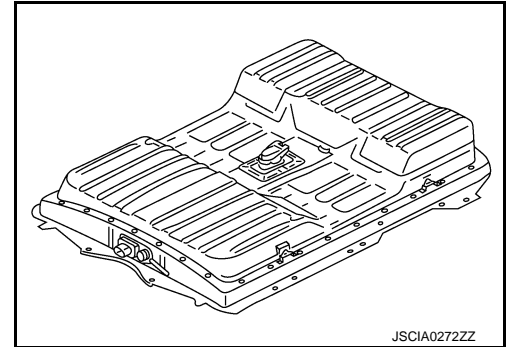
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No.	Component	Function
9.	Rear module stack	EVB-13, "Module"
10.	Battery temperature sensor (Rear center)	EVB-14, "Battery Temperature Sensor"
11.	Battery temperature sensor (Rear RH)	EVB-14, "Battery Temperature Sensor"

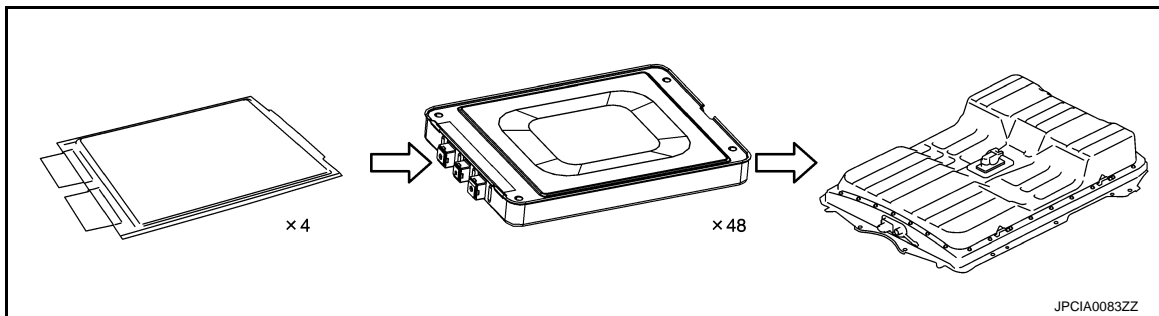
Li-ion Battery

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- A Li-ion battery with flat construction is placed under floor.
- The battery pack is equipped with necessary devices, such as Li-ion battery controller, battery junction box, and service plug in addition to a battery storing electricity.



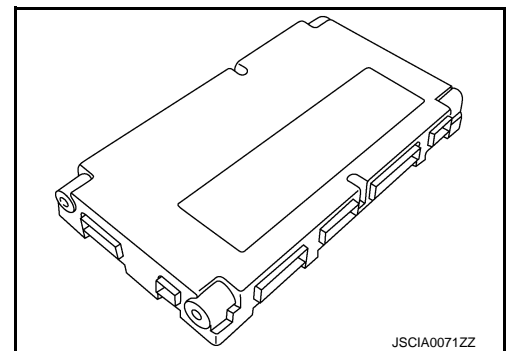
- Four cells are integrated into a single module. The Li-ion battery consists of forty-eight modules placed in series.



Li-ion Battery Controller

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- Li-ion battery controller (LBC) is included in the battery pack and installed on the left surface of the rear module stack.



- The Li-ion battery controller is the core of battery control. This Li-ion battery controller detects the voltage and current of the assembled battery, the temperature of each module, and the voltage of each cell to judge SOC (state of charge) and calculates possible input/output values, meter indication value, and chargeable value to send these data to VCM (vehicle control module). VCM controls the vehicle, according to the battery state.

Main Role of Li-ion Battery Controller

1. Li-ion battery state check
 - SOC (state of charge)
 - Possible output value
 - Possible input value
 - Temperature

COMPONENT PARTS

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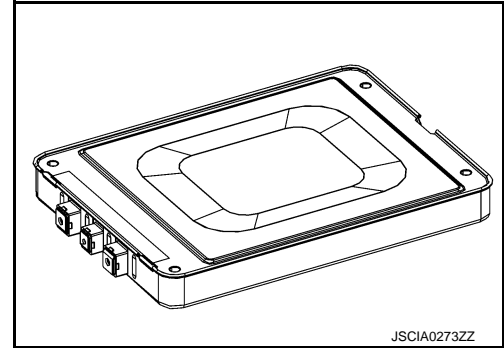
2. Optimization of Li-ion battery voltage
3. Prevention of overvoltage and overcurrent
4. Prevention of overheat
5. Detection of decrease in insulation resistance of high-voltage circuit
6. Detection of a fit of high voltage harness connector and service plug

Module

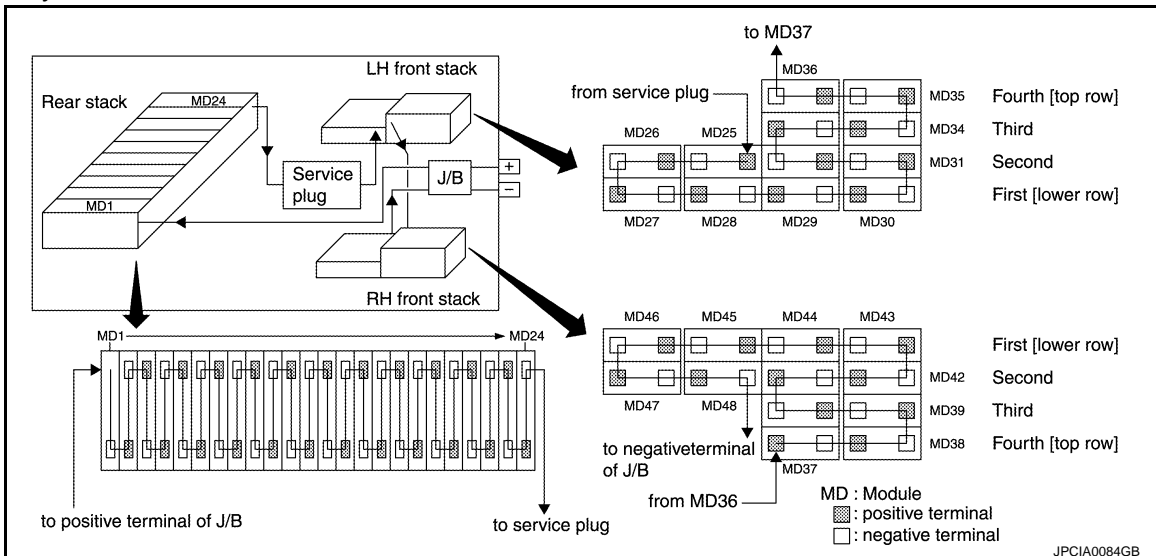
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- Four laminated cells are integrated into one module.
- The Li-ion battery is equipped with forty-eight modules.
- There are two kinds of modules, according to the location of positive and negative terminals.

Positive terminal : Red
 Negative terminal : Black



Module layout

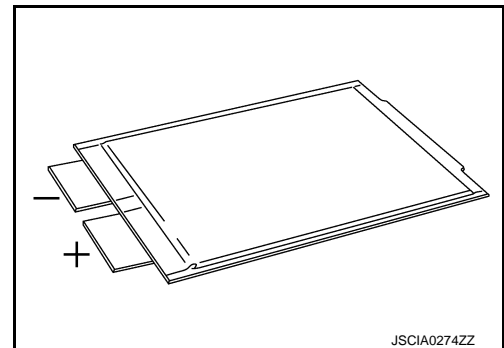


NOTE:

The highest potential is module (MD) 1 and the lowest is module (MD) 48.

Cell

These are thin laminated cells with excellent cooling performance.



The Features of laminated cell

- Large surface area with excellent cooling performance reduces heat load to the battery and improves battery life.
- The light and thin structure increases the flexibility in layout.

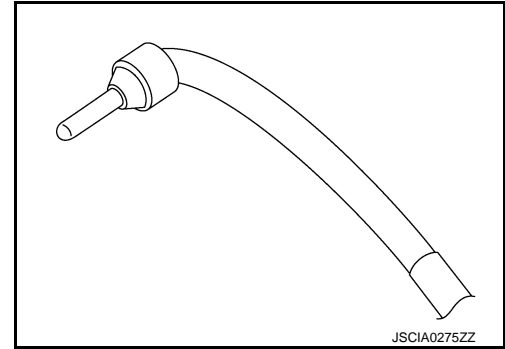
COMPONENT PARTS

< SYSTEM DESCRIPTION >

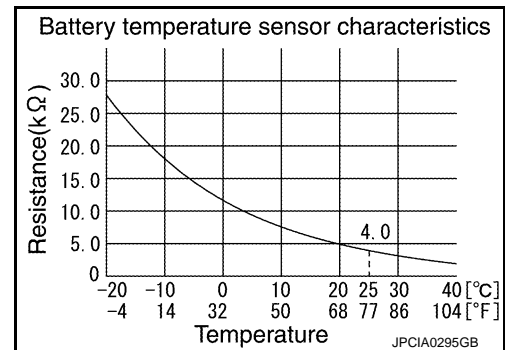
Battery Temperature Sensor

INFOID:000000007005721

- Four battery temperature sensors mounted in the battery pack measures the temperature.
- Right and left front module stacks have one battery temperature sensor, respectively, and the rear module stack has two.



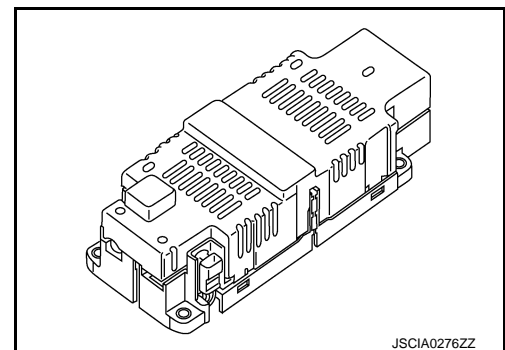
- The sensor integrated with thermistor decreases electric resistance as temperature increases.



Battery Junction Box

INFOID:000000007005722

- The battery junction box is installed to the front side in the battery pack.
- The battery junction box includes:
 - System main relay to provide/cut off DC current sent from Li-ion battery.
 - Pre-charge relay to protect the high voltage circuit from a high current immediately after power switch ON.
 - Current sensor to calculate battery capacity.
- Installed to both positive side and negative side, the system main relay provides DC current to each high voltage part. In addition, the system main relay provides DC current to the Li-ion battery during motor regeneration or charge.
- When an error occurs in the system, the system main relay is turned OFF and the Li-ion battery is shut off to ensure the safety, based on a command from VCM (Vehicle control module).



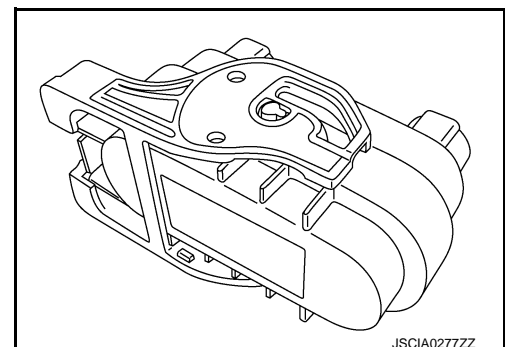
Service Plug

INFOID:000000007005723

- The service plug is included in the Li-ion battery to securely shut off the high voltage during high voltage part inspection and maintenance.
- The service plug is installed on the upper surface of the battery pack. The plug can be removed when the legroom-mounted service plug cover is removed.

WARNING:

Always use insulating protective equipment when removing and installing service plug



High Voltage Warning Label

INFOID:000000007005724

- High voltage warning label is stuck on each component parts below.

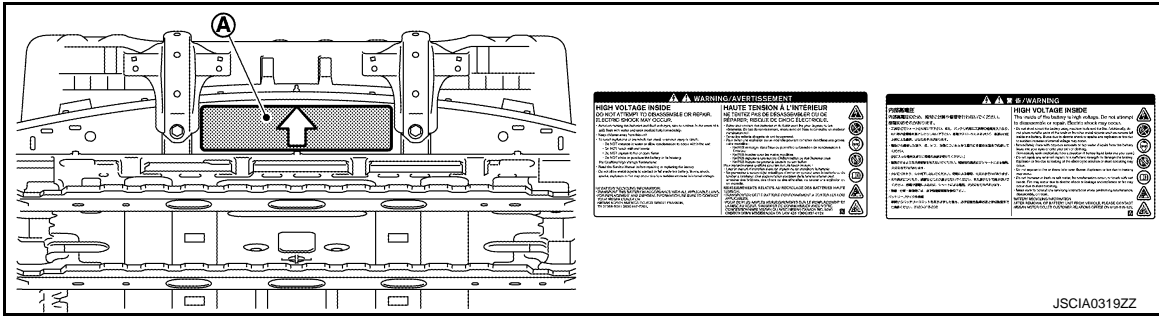
COMPONENT PARTS

< SYSTEM DESCRIPTION >

- When replacing component parts make sure to stick it on original position.

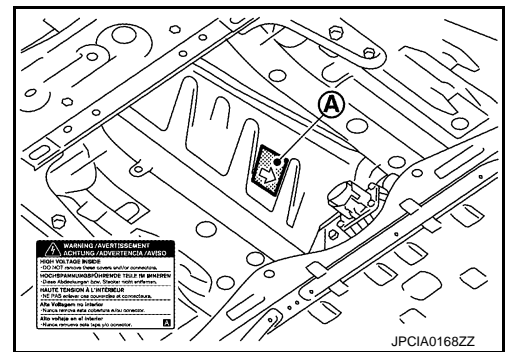
Li-ion Battery

- The label is affixed on the rear end of Li-ion battery.



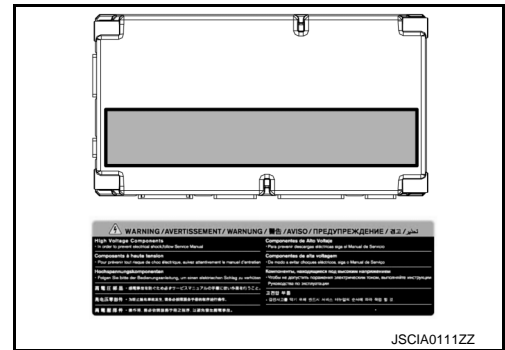
← : Vehicle front

- The label is affixed on the body panel near the high voltage harness connector.



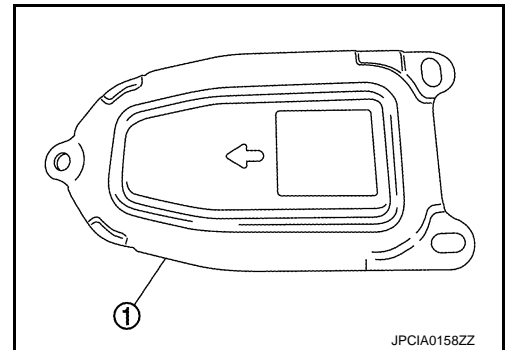
Li-ion Battery Controller

The label is affixed on the main body of controller.



Service Plug

The label is affixed on the inspection hole cover.



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SYSTEM

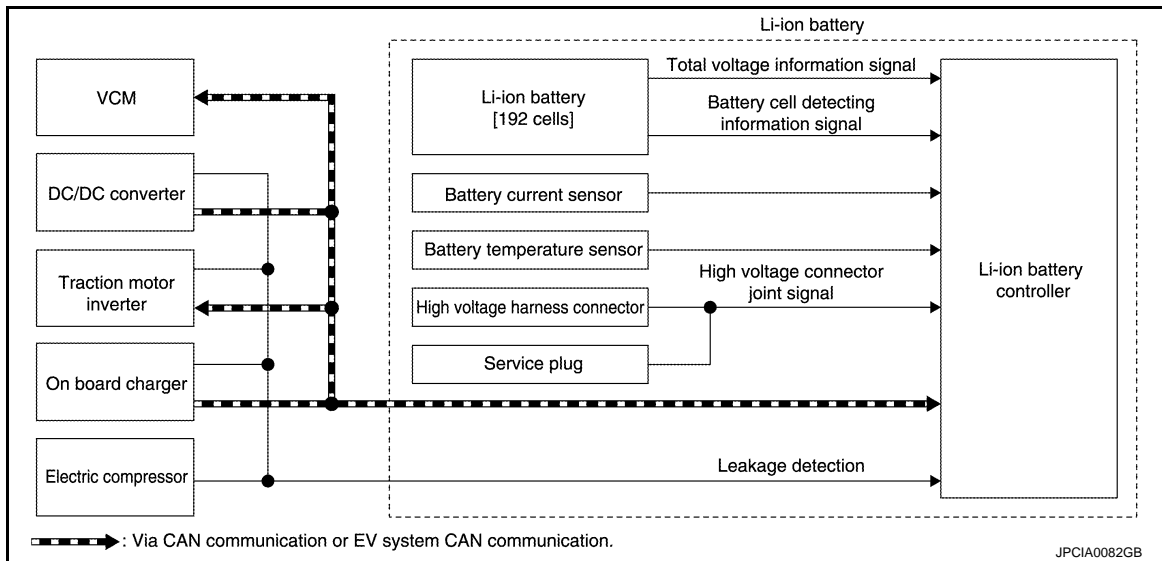
< SYSTEM DESCRIPTION >

SYSTEM

System Description

INFOID:000000007005725

SYSTEM DIAGRAM



INPUT/OUTPUT SIGNAL ITEM

Input Signal Item

Transmit unit	Signal name	
VCM	EV system CAN	Target Li-ion battery remained energy signal

Output Signal Item

Transmit unit	Signal name	
VCM	EV system CAN	High voltage discharge permit signal
		Li-ion battery main relay cut request signal
		Li-ion battery connector interlock signal
		Li-ion battery voltage signal
		Li-ion battery current signal
		Li-ion battery available charge signal
		Li-ion battery chargeable power signal
		Li-ion battery dischargeable power signal
		Li-ion battery chargeable completion signal
		Li-ion battery remained signal
		Li-ion battery capacity signal
		Li-ion battery gradual capacity loss signal
Insulation resistance signal		

Description

The Li-ion battery controller performs control as follows:

- Monitors the battery state and transfers chargeable/dischargeable power to VCM (vehicle control module) to prevent an error, such as overvoltage, over discharge, overcurrent, and an excessive temperature rise in the battery.
- Detects an error (overvoltage, over discharge, overcurrent, or excessive temperature rise) immediately at the time of error occurrence and requests the system main relay shutoff to VCM to shut off the discharge/charge line.

SYSTEM

< SYSTEM DESCRIPTION >

- Maintains the optimum battery state constantly with a cell capacity adjustment function to prevent a reduction in charging/discharging capacity caused by cell capacity variations.
- Detects the connector fit state with the function to detect the fit of the high voltage harness connector and transfers the detected state to VCM so that the vehicle does not start with an unsteady state.
- Detects the insulation resistance state with the function to detect the insulation resistance between high and low voltage and transfers the detected state to VCM so that the vehicle does not start with an unusual state.
- Estimates a battery charge state and low battery state, based on the data obtained with the battery state detection function, and reflects on the battery capacity meter.

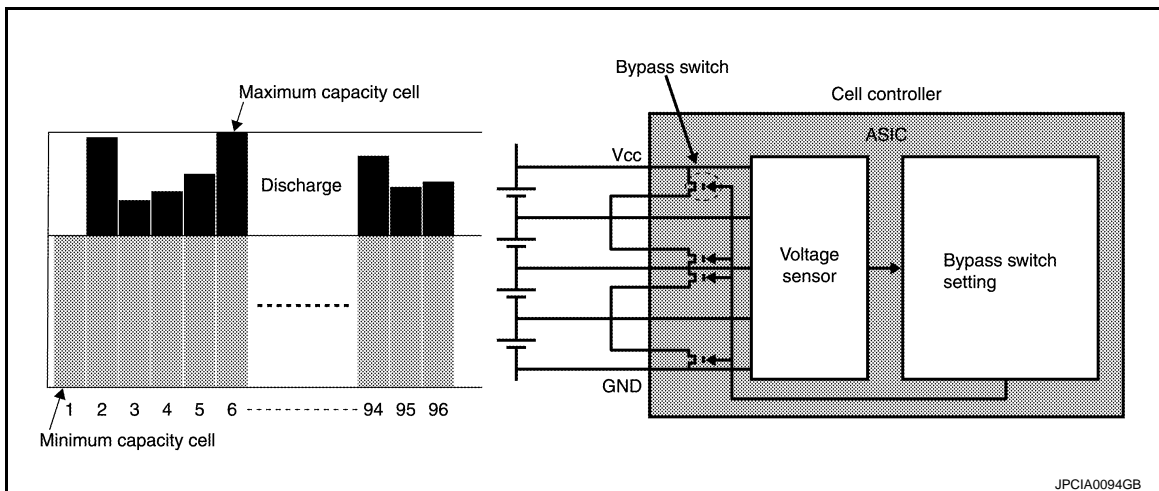
BATTERY PROTECTION

The Li-ion battery has a voltage range capable of charge/discharge. If charged/discharged exceeding the range, excessive low capacity or malfunction may be caused. To prevent this, the Li-ion battery controller detects voltage of each cell and requests the control of charging/discharging energy to VCM so that the cell voltage stays within the voltage range.

Control item	Control	Operating condition
Overvoltage/overcurrent protection	Charging energy control	Gradual control of charging energy as the cell voltage approaches the upper limit of the voltage capable of charging.
	System main relay cut	Cell voltage exceeds the voltage judged as overvoltage and maintains the voltage for more than the specified time.
Over discharge protection	Discharging energy control	Gradual control of discharging energy as the cell voltage approaches the lower limit of the voltage capable of discharging.
	System main relay cut	Cell voltage exceeds the voltage judged as over discharge and maintains the voltage for more than the specified time.
Excessive temperature rise protection	Charging/discharging energy control	Gradual control of charging/discharging energy as a Li-ion battery temperature approaches the upper limit of the temperature capable of use.
	System main relay cut	Li-ion battery temperature exceeds the temperature judged as excessive temperature rise and maintains the temperature for more than the specified time.

HOW TO ADJUST CELL CAPACITY

Cell capacity adjustment means the adjustment of cell capacity to a target capacity by estimating the capacity of each cell from the no-load voltage at system startup. The voltage of each cell is detected by the Li-ion battery controller and the bypass switch is turned ON to perform the discharge of a cell with the high capacity. Accordingly, the utilization of the capacity of each cell is maximized by adjusting the capacity with the Li-ion battery controller.

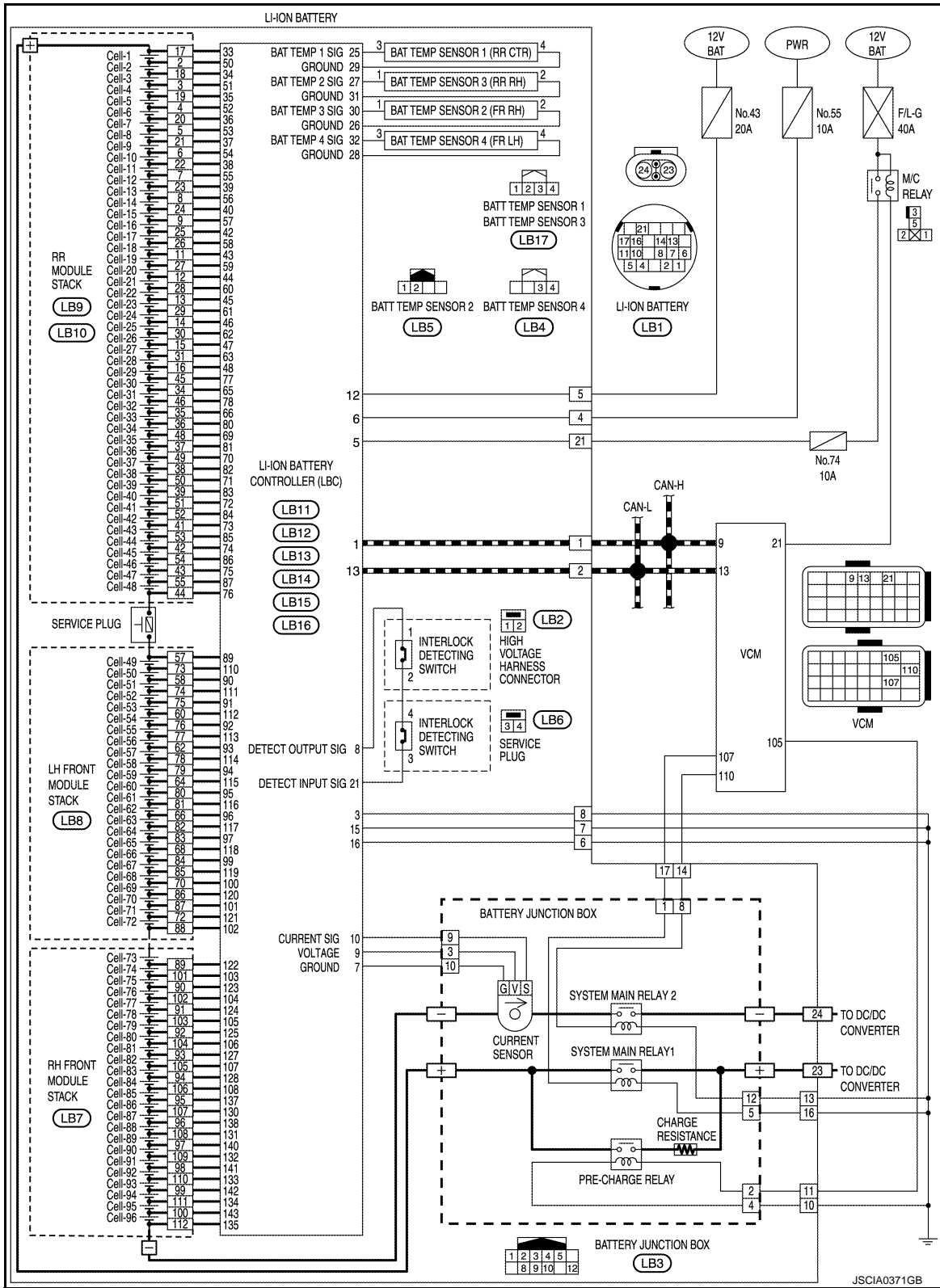


SYSTEM

< SYSTEM DESCRIPTION >

Circuit Diagram

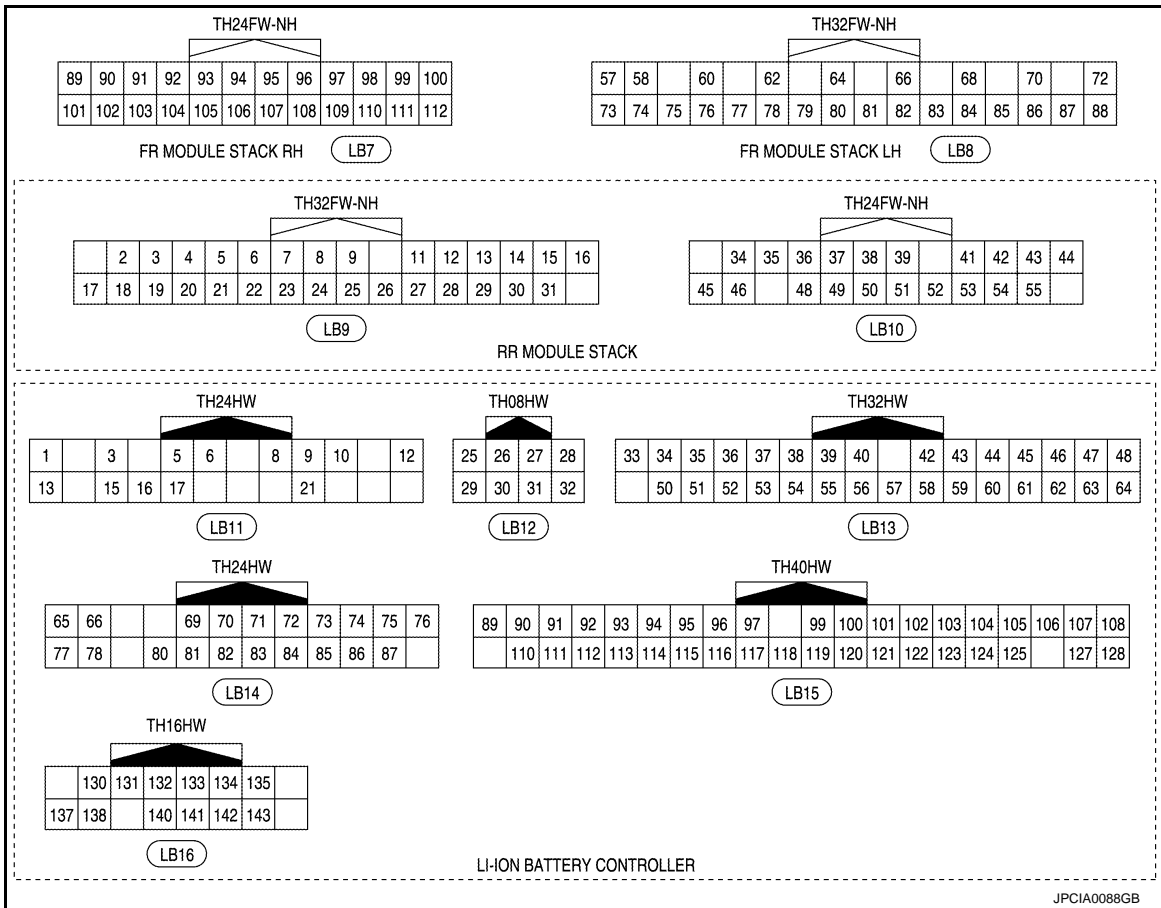
INFOID:000000007005726



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SYSTEM

< SYSTEM DESCRIPTION >

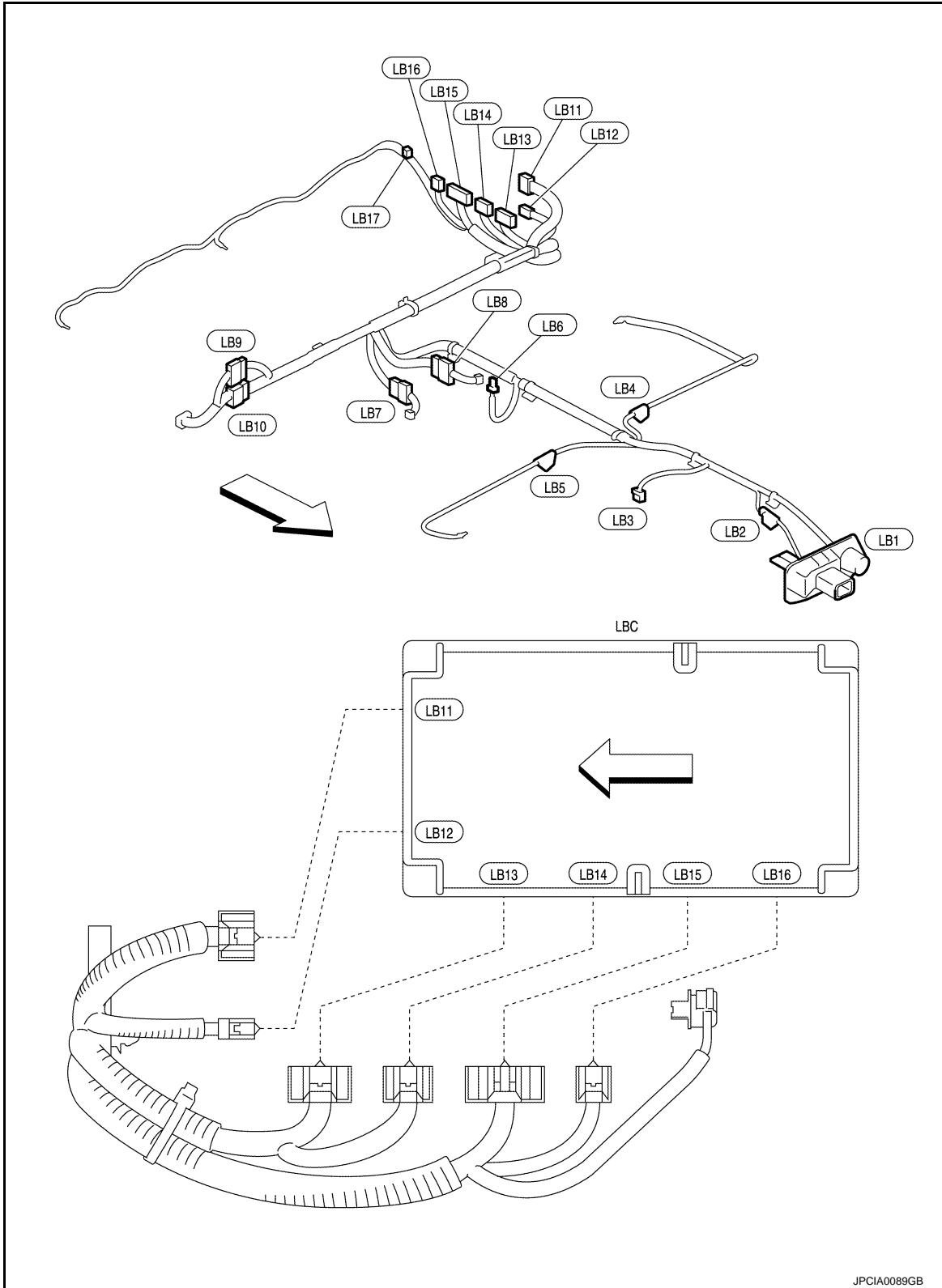


Harness Layout

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SYSTEM

< SYSTEM DESCRIPTION >



← : Vehicle front

HANDLING PRECAUTION

< SYSTEM DESCRIPTION >

HANDLING PRECAUTION

EV Battery System

INFOID:000000007005727

- To improve the Li-ion battery life, never perform quick charge heavily.
- Use the method of nighttime normal charge or timer-controlled charge.
- Never perform rapid acceleration/deceleration.
- Never place EV battery at an area exposed to direct sunlight or under high temperature conditions.

Battery keeping at workshop

1. Always right side up.
2. Never double stack.
3. Never place directly on floor.

NOTE:

Place on palette or rubber sheet.

4. Always put cover sheet over.
5. Always cover service plug basement and each connector by insulating tape.
6. Always place caution label with the name of person in charge.
7. Always put away from water.
8. Make sure nothing around Li-ion battery to fall on the Li-ion battery.
9. Always place Li-ion battery away from direct sunshine and good breathability. (Never leave it at outside)

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DIAGNOSIS SYSTEM (LBC)

< SYSTEM DESCRIPTION >

DIAGNOSIS SYSTEM (LBC)

CONSULT Function

INFOID:000000007005728

APPLICATION ITEM

CONSULT performs the following functions via CAN communication with Li-ion battery controller (LBC).

Item	Function
Work Support	Adjusts the components or systems quickly and exactly.
Self-diagnosis results	Receives the self-diagnosis result of the control unit is received and displays the malfunction system.
Data Monitor	Receives, displays, and records the input/output signals from control unit.
CAN Diagnosis	Displays the CAN diagnosis results.
CAN Diagnosis Support Monitor	Displays the CAN communication status.
ECU Identification	Displays control unit part number or identification number.

WORK SUPPORT

Work item	CONDITION	USAGE
SAVE BATTERY INFORMATION DATA	In this mode, the data saved in the LBC is stored in CONSULT.	When Li-ion battery and LBC are replaced.
WRITE BATTERY INFORMATION DATA	In this mode, write data stored by "SAVE BATTERY INFORMATION DATA" in work support mode to LBC.	When Li-ion battery and LBC are replaced.
CLEAR BATTERY RADUAL CAPACITY LOSS DATA	Li-ion battery radual capacity loss data stored in LBC is cleared.	When all modules of Li-ion battery replaced.
CLEAR BATT CHARGE/DISCHARGE INFORMATION DATA	Li-ion battery charge/discharge information data stored in LBC is cleared.	When all modules of Li-ion battery replaced.

ECU IDENTIFICATION

Part number of LBC can be checked.

SELF-DIAGNOSIS RESULT

Self Diagnostic Item

Regarding items of DTC, refer to [EVB-34, "DTC Index"](#).

How to Erase DTC

1. Select "HV BAT" with CONSULT.
2. "SELF-DIAGNOSIS RESULT".
3. Touch "ERASE". (DTC in LBC will be erased.)

FREEZE FRAME DATA (FFD)

The following vehicle status is recorded when DTC is detected and is displayed on CONSULT.

Monitored item (Unit)	Remarks
DTC	Displays the DTC which caused FFD memory
BATT ELECTRIC CURRENT	A
12V BATTERY VOLTAGE	mV
IR SEN SHORT PULSE	mV
SERVICE PLUG INTERLOCK	OPEN / CLOSE
CELL VOLTAGE 01 - 96	mV
TOTAL BATTERY VOLTAGE	V
BATTERY TEMPERATURE 1	degC

DIAGNOSIS SYSTEM (LBC)

< SYSTEM DESCRIPTION >

Monitored item (Unit)		Remarks
BATTERY TEMPERATURE 2	degC	Displays the temperature calculated with a signal voltage from battery temperature 2
BATTERY TEMPERATURE 3	degC	Displays the temperature calculated with a signal voltage from battery temperature 3
BATTERY TEMPERATURE 4	degC	Displays the temperature calculated with a signal voltage from battery temperature 4

DATA MONITOR

Monitored item	Unit	Remark
BATT ELECTRIC CURRENT	A	Displays the Li-ion battery current value
12V BATTERY VOLTAGE	mV	Displays 12V battery power supply voltage
IR SEN SHORT PULSE	mV	Displays the maximum to minimum difference of voltage magnitude of the on-board isolation resistance monitoring system
SERVICE PLUG INTERLOCK	OPEN / CLOSE	Displays the OPEN/CLOSE state of the service plug
CELL VOLTAGE 01 - 96	mV	Displays each cell voltage
TOTAL BATTERY VOLTAGE	V	Displays the total voltage of the Li-ion battery
MAXIMUM CELL VOLTAGE	mV	Displays the maximum cell voltage value
MINIMUM CELL VOLTAGE	mV	Displays the minimum cell voltage value
BATTERY TEMPERATURE 1	degC	Displays the temperature calculated with a signal voltage from battery temperature 1
BATTERY TEMPERATURE 2	degC	Displays the temperature calculated with a signal voltage from battery temperature 2
BATTERY TEMPERATURE 3	degC	Displays the temperature calculated with a signal voltage from battery temperature 3
BATTERY TEMPERATURE 4	degC	Displays the temperature calculated with a signal voltage from battery temperature 4

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EV BATTERY SYSTEM

< ECU DIAGNOSIS INFORMATION >

ECU DIAGNOSIS INFORMATION

EV BATTERY SYSTEM

Reference Value

INFOID:000000007005729

VALUE ON THE DIAGNOSIS TOOL

NOTE:

Specification data are reference values.

Monitor item	Condition		Values / Status
BATT ELECTRIC CURRENT	READY	Stop the vehicle	Approx. (-10) - (+20) A
12V BATTERY VOLTAGE	READY		Approx. 1,100 – 1,400 mV
IR SEN SHORT PULSE	READY		Approx. 4,100 – 4,300 mV
SERVICE PLUG INTER-LOCK	READY	Connect service plug	REQ
	READY	Disconnect service plug	NOT REQ
CELL VOLTAGE 01	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 02	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 03	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 04	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 05	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 06	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 07	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 08	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 09	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 10	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 11	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 12	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 13	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 14	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 15	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV

EV BATTERY SYSTEM

< ECU DIAGNOSIS INFORMATION >

Monitor item	Condition		Values / Status	
CELL VOLTAGE 16	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	A
		SOC 95 %	Approx. 4,000 - 4,200 mV	
CELL VOLTAGE 17	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	B
		SOC 95 %	Approx. 4,000 - 4,200 mV	
CELL VOLTAGE 18	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	EVB
		SOC 95 %	Approx. 4,000 - 4,200 mV	
CELL VOLTAGE 19	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	
		SOC 95 %	Approx. 4,000 - 4,200 mV	D
CELL VOLTAGE 20	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	
		SOC 95 %	Approx. 4,000 - 4,200 mV	
CELL VOLTAGE 21	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	E
		SOC 95 %	Approx. 4,000 - 4,200 mV	
CELL VOLTAGE 22	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	
		SOC 95 %	Approx. 4,000 - 4,200 mV	F
CELL VOLTAGE 23	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	
		SOC 95 %	Approx. 4,000 - 4,200 mV	G
CELL VOLTAGE 24	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	
		SOC 95 %	Approx. 4,000 - 4,200 mV	H
CELL VOLTAGE 25	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	
		SOC 95 %	Approx. 4,000 - 4,200 mV	I
CELL VOLTAGE 26	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	
		SOC 95 %	Approx. 4,000 - 4,200 mV	J
CELL VOLTAGE 27	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	
		SOC 95 %	Approx. 4,000 - 4,200 mV	K
CELL VOLTAGE 28	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	
		SOC 95 %	Approx. 4,000 - 4,200 mV	L
CELL VOLTAGE 29	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	
		SOC 95 %	Approx. 4,000 - 4,200 mV	M
CELL VOLTAGE 30	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	
		SOC 95 %	Approx. 4,000 - 4,200 mV	N
CELL VOLTAGE 31	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	
		SOC 95 %	Approx. 4,000 - 4,200 mV	O
CELL VOLTAGE 32	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	
		SOC 95 %	Approx. 4,000 - 4,200 mV	P
CELL VOLTAGE 33	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	
		SOC 95 %	Approx. 4,000 - 4,200 mV	
CELL VOLTAGE 34	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	
		SOC 95 %	Approx. 4,000 - 4,200 mV	
CELL VOLTAGE 35	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	
		SOC 95 %	Approx. 4,000 - 4,200 mV	
CELL VOLTAGE 36	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	
		SOC 95 %	Approx. 4,000 - 4,200 mV	
CELL VOLTAGE 37	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	
		SOC 95 %	Approx. 4,000 - 4,200 mV	

EV BATTERY SYSTEM

< ECU DIAGNOSIS INFORMATION >

Monitor item	Condition		Values / Status
CELL VOLTAGE 38	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 39	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 40	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 41	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 42	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 43	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 44	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 45	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 46	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 47	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 48	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 49	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 50	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 51	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 52	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 53	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 54	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 55	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 56	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 57	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 58	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 59	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV

EV BATTERY SYSTEM

< ECU DIAGNOSIS INFORMATION >

Monitor item	Condition		Values / Status	
CELL VOLTAGE 60	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	A
		SOC 95 %	Approx. 4,000 - 4,200 mV	
CELL VOLTAGE 61	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	B
		SOC 95 %	Approx. 4,000 - 4,200 mV	
CELL VOLTAGE 62	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	EVB
		SOC 95 %	Approx. 4,000 - 4,200 mV	
CELL VOLTAGE 63	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	
		SOC 95 %	Approx. 4,000 - 4,200 mV	
CELL VOLTAGE 64	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	D
		SOC 95 %	Approx. 4,000 - 4,200 mV	
CELL VOLTAGE 65	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	E
		SOC 95 %	Approx. 4,000 - 4,200 mV	
CELL VOLTAGE 66	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	F
		SOC 95 %	Approx. 4,000 - 4,200 mV	
CELL VOLTAGE 67	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	
		SOC 95 %	Approx. 4,000 - 4,200 mV	G
CELL VOLTAGE 68	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	
		SOC 95 %	Approx. 4,000 - 4,200 mV	H
CELL VOLTAGE 69	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	
		SOC 95 %	Approx. 4,000 - 4,200 mV	I
CELL VOLTAGE 70	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	
		SOC 95 %	Approx. 4,000 - 4,200 mV	J
CELL VOLTAGE 71	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	
		SOC 95 %	Approx. 4,000 - 4,200 mV	K
CELL VOLTAGE 72	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	
		SOC 95 %	Approx. 4,000 - 4,200 mV	L
CELL VOLTAGE 73	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	
		SOC 95 %	Approx. 4,000 - 4,200 mV	M
CELL VOLTAGE 74	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	
		SOC 95 %	Approx. 4,000 - 4,200 mV	N
CELL VOLTAGE 75	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	
		SOC 95 %	Approx. 4,000 - 4,200 mV	O
CELL VOLTAGE 76	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	
		SOC 95 %	Approx. 4,000 - 4,200 mV	P
CELL VOLTAGE 77	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	
		SOC 95 %	Approx. 4,000 - 4,200 mV	
CELL VOLTAGE 78	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	
		SOC 95 %	Approx. 4,000 - 4,200 mV	
CELL VOLTAGE 79	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	
		SOC 95 %	Approx. 4,000 - 4,200 mV	
CELL VOLTAGE 80	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	
		SOC 95 %	Approx. 4,000 - 4,200 mV	
CELL VOLTAGE 81	READY	SOC 5 %	Approx. 3,200 - 3,400 mV	
		SOC 95 %	Approx. 4,000 - 4,200 mV	

EV BATTERY SYSTEM

< ECU DIAGNOSIS INFORMATION >

Monitor item	Condition		Values / Status
CELL VOLTAGE 82	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 83	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 84	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 85	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 86	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 87	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 88	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 89	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 90	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 91	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 92	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 93	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 94	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 95	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
CELL VOLTAGE 96	READY	SOC 5 %	Approx. 3,200 - 3,400 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
TOTAL BATTERY VOLTAGE	READY	SOC 5 %	Approx. 300 - 350 V
		SOC 95 %	Approx. 370 - 420 V
MAXIMUM CELL VOLTAGE	READY	SOC 5 %	Approx. 3,300 - 3,500 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
MINIMUM CELL VOLTAGE	READY	SOC 5 %	Approx. 3,300 - 3,500 mV
		SOC 95 %	Approx. 4,000 - 4,200 mV
BATTERY TEMPERATURE 1	READY (Stop the vehicle)	Ambient temperature: 25°C	20 - 30°C [Equivalent to air temperature around rear module stack]
BATTERY TEMPERATURE 2	READY (Stop the vehicle)	Ambient temperature: 25°C	20 - 30°C [Equivalent to air temperature around front RH module stack]

EV BATTERY SYSTEM

< ECU DIAGNOSIS INFORMATION >

Monitor item	Condition		Values / Status
BATTERY TEMPERATURE 3	READY (Stop the vehicle)	Ambient temperature: 25°C	20 - 30°C [Equivalent to air temperature around rear module stack]
BATTERY TEMPERATURE 4	READY (Stop the vehicle)	Ambient temperature: 25°C	20 - 30°C [Equivalent to air temperature around front LH module stack]

Fail-safe

INFOID:000000007005730

When Li-ion Battery Controller (LBC) detects a malfunction of the Li-ion battery, it enters the control mode that protects the battery by stopping or restricting the output/charging from/to the battery. The fail-safe mode differs depending on the contents of the detected malfunction.

FAIL-SAFE PATTERN

- Pattern A: No driving and Charge stop
- Pattern B: Driving output power limit, and Charge stop
- Pattern C: Driving output power limit, and Charge limit
- Pattern D: EV system warning lamp illuminate

FAIL-SAFE LIST

DTC	CONSULT screen items	Pattern			
		A	B	C	D
P0A0D	HV SYSTEM INTERLOCK ERROR				×
P0A1F	BATTERY ENERGY CONTROL MODULE	×	×		×
P3030	CELL CONT LIN		×		
P3031	CELL CONT ASIC1		×		
P3032	CELL CONT ASIC2		×		
P3033	CELL CONT ASIC3		×		
P3034	CELL CONT ASIC4		×		
P3035	CELL CONT ASIC5		×		
P3036	CELL CONT ASIC6		×		
P3037	CELL CONT ASIC7		×		
P3038	CELL CONT ASIC8		×		
P3039	CELL CONT ASIC9		×		
P303A	CELL CONT ASIC10		×		
P303B	CELL CONT ASIC11		×		
P303C	CELL CONT ASIC12		×		
P303D	CELL CONT ASIC13		×		
P303E	CELL CONT ASIC14		×		
P303F	CELL CONT ASIC15		×		
P3040	CELL CONT ASIC16		×		
P3041	CELL CONT ASIC17		×		
P3042	CELL CONT ASIC18		×		
P3043	CELL CONT ASIC19		×		
P3044	CELL CONT ASIC20		×		
P3045	CELL CONT ASIC21		×		
P3046	CELL CONT ASIC22		×		
P3047	CELL CONT ASIC23		×		
P3048	CELL CONT ASIC24		×		

EV BATTERY SYSTEM

< ECU DIAGNOSIS INFORMATION >

DTC	CONSULT screen items	Pattern			
		A	B	C	D
P3049	CELL CONT ASIC1 VOLT		×		
P304A	CELL CONT ASIC2 VOLT		×		
P304B	CELL CONT ASIC3 VOLT		×		
P304C	CELL CONT ASIC4 VOLT		×		
P304D	CELL CONT ASIC5 VOLT		×		
P304E	CELL CONT ASIC6 VOLT		×		
P304F	CELL CONT ASIC7 VOLT		×		
P3050	CELL CONT ASIC8 VOLT		×		
P3051	CELL CONT ASIC9 VOLT		×		
P3052	CELL CONT ASIC10 VOLT		×		
P3053	CELL CONT ASIC11 VOLT		×		
P3054	CELL CONT ASIC12 VOLT		×		
P3055	CELL CONT ASIC13 VOLT		×		
P3056	CELL CONT ASIC14 VOLT		×		
P3057	CELL CONT ASIC15 VOLT		×		
P3058	CELL CONT ASIC16 VOLT		×		
P3059	CELL CONT ASIC17 VOLT		×		
P305A	CELL CONT ASIC18 VOLT		×		
P305B	CELL CONT ASIC19 VOLT		×		
P305C	CELL CONT ASIC20 VOLT		×		
P305D	CELL CONT ASIC21 VOLT		×		
P305E	CELL CONT ASIC22 VOLT		×		
P305F	CELL CONT ASIC23 VOLT		×		
P3060	CELL CONT ASIC24 VOLT		×		
P3061	CELL BATTERY VOLT				×
P3062	BYPASS SW				×
P308B	CELL CONT ASIC1 OPEN		×		
P308C	CELL CONT ASIC2 OPEN		×		
P308D	CELL CONT ASIC3 OPEN		×		
P308E	CELL CONT ASIC4 OPEN		×		
P308F	CELL CONT ASIC5 OPEN		×		
P3090	CELL CONT ASIC6 OPEN		×		
P3091	CELL CONT ASIC7 OPEN		×		
P3092	CELL CONT ASIC8 OPEN		×		
P3093	CELL CONT ASIC9 OPEN		×		
P3094	CELL CONT ASIC10 OPEN		×		
P3095	CELL CONT ASIC11 OPEN		×		
P3096	CELL CONT ASIC12 OPEN		×		
P3097	CELL CONT ASIC13 OPEN		×		
P3098	CELL CONT ASIC14 OPEN		×		
P3099	CELL CONT ASIC15 OPEN		×		
P309A	CELL CONT ASIC16 OPEN		×		
P309B	CELL CONT ASIC17 OPEN		×		

EV BATTERY SYSTEM

< ECU DIAGNOSIS INFORMATION >

DTC	CONSULT screen items	Pattern				
		A	B	C	D	
P309C	CELL CONT ASIC18 OPEN		×			A
P309D	CELL CONT ASIC19 OPEN		×			B
P309E	CELL CONT ASIC20 OPEN		×			
P309F	CELL CONT ASIC21 OPEN		×			
P30A0	CELL CONT ASIC22 OPEN		×			EVB
P30A1	CELL CONT ASIC23 OPEN		×			
P30A2	CELL CONT ASIC24 OPEN		×			
P30F3	TOTAL VOLT SENSOR			×		D
P30F4	TOTAL VOLT SENSOR			×		
P30F5	TOTAL VOLT SENSOR			×		E
P30FC	OVER CURRENT	×				
P30FD	TOTAL VOLTAGE MONITOR SWITCH	No fail-safe				
P30FE	12V BATTERY VOLTAGE				×	F
P318D	COMMUNICATION ERROR				×	
P318E	COMMUNICATION ERROR				×	G
P3191	COMMUNICATION ERROR	No fail-safe				
P3196	COMMUNICATION ERROR	No fail-safe				
P3199	COMMUNICATION ERROR				×	H
P319C	COMMUNICATION ERROR	No fail-safe				
P31A4	CAN ERROR VCM				×	I
P31A7	CAN ERROR INV/MC	No fail-safe				
P3300	TOTAL VOLTAGE OVER	×				
P3302	CELL OVER VOLTAGE MODULE1	×				J
P3303	CELL OVER VOLTAGE MODULE2	×				
P3304	CELL OVER VOLTAGE MODULE3	×				K
P3305	CELL OVER VOLTAGE MODULE4	×				
P3306	CELL OVER VOLTAGE MODULE5	×				
P3307	CELL OVER VOLTAGE MODULE6	×				L
P3308	CELL OVER VOLTAGE MODULE7	×				
P3309	CELL OVER VOLTAGE MODULE8	×				M
P330A	CELL OVER VOLTAGE MODULE9	×				
P330B	CELL OVER VOLTAGE MODULE10	×				
P330C	CELL OVER VOLTAGE MODULE11	×				N
P330D	CELL OVER VOLTAGE MODULE12	×				
P330E	CELL OVER VOLTAGE MODULE13	×				O
P330F	CELL OVER VOLTAGE MODULE14	×				
P3310	CELL OVER VOLTAGE MODULE15	×				
P3311	CELL OVER VOLTAGE MODULE16	×				P
P3312	CELL OVER VOLTAGE MODULE17	×				
P3313	CELL OVER VOLTAGE MODULE18	×				
P3314	CELL OVER VOLTAGE MODULE19	×				
P3315	CELL OVER VOLTAGE MODULE20	×				
P3316	CELL OVER VOLTAGE MODULE21	×				

EV BATTERY SYSTEM

< ECU DIAGNOSIS INFORMATION >

DTC	CONSULT screen items	Pattern			
		A	B	C	D
P3317	CELL OVER VOLTAGE MODULE22	×			
P3318	CELL OVER VOLTAGE MODULE23	×			
P3319	CELL OVER VOLTAGE MODULE24	×			
P331A	CELL OVER VOLTAGE MODULE25	×			
P331B	CELL OVER VOLTAGE MODULE26	×			
P331C	CELL OVER VOLTAGE MODULE27	×			
P331D	CELL OVER VOLTAGE MODULE28	×			
P331E	CELL OVER VOLTAGE MODULE29	×			
P331F	CELL OVER VOLTAGE MODULE30	×			
P3320	CELL OVER VOLTAGE MODULE31	×			
P3321	CELL OVER VOLTAGE MODULE32	×			
P3322	CELL OVER VOLTAGE MODULE33	×			
P3323	CELL OVER VOLTAGE MODULE34	×			
P3324	CELL OVER VOLTAGE MODULE35	×			
P3325	CELL OVER VOLTAGE MODULE36	×			
P3326	CELL OVER VOLTAGE MODULE37	×			
P3327	CELL OVER VOLTAGE MODULE38	×			
P3328	CELL OVER VOLTAGE MODULE39	×			
P3329	CELL OVER VOLTAGE MODULE40	×			
P332A	CELL OVER VOLTAGE MODULE41	×			
P332B	CELL OVER VOLTAGE MODULE42	×			
P332C	CELL OVER VOLTAGE MODULE43	×			
P332D	CELL OVER VOLTAGE MODULE44	×			
P332E	CELL OVER VOLTAGE MODULE45	×			
P332F	CELL OVER VOLTAGE MODULE46	×			
P3330	CELL OVER VOLTAGE MODULE47	×			
P3331	CELL OVER VOLTAGE MODULE48	×			
P3375	CELL OVER DISCHARGE MODULE1	×			
P3376	CELL OVER DISCHARGE MODULE2	×			
P3377	CELL OVER DISCHARGE MODULE3	×			
P3378	CELL OVER DISCHARGE MODULE4	×			
P3379	CELL OVER DISCHARGE MODULE5	×			
P337A	CELL OVER DISCHARGE MODULE6	×			
P337B	CELL OVER DISCHARGE MODULE7	×			
P337C	CELL OVER DISCHARGE MODULE8	×			
P337D	CELL OVER DISCHARGE MODULE9	×			
P337E	CELL OVER DISCHARGE MODULE10	×			
P337F	CELL OVER DISCHARGE MODULE11	×			
P3380	CELL OVER DISCHARGE MODULE12	×			
P3381	CELL OVER DISCHARGE MODULE13	×			
P3382	CELL OVER DISCHARGE MODULE14	×			
P3383	CELL OVER DISCHARGE MODULE15	×			
P3384	CELL OVER DISCHARGE MODULE16	×			

EV BATTERY SYSTEM

< ECU DIAGNOSIS INFORMATION >

DTC	CONSULT screen items	Pattern				
		A	B	C	D	
P3385	CELL OVER DISCHARGE MODULE17	×				A
P3386	CELL OVER DISCHARGE MODULE18	×				B
P3387	CELL OVER DISCHARGE MODULE19	×				
P3388	CELL OVER DISCHARGE MODULE20	×				
P3389	CELL OVER DISCHARGE MODULE21	×				EVB
P338A	CELL OVER DISCHARGE MODULE22	×				
P338B	CELL OVER DISCHARGE MODULE23	×				
P338C	CELL OVER DISCHARGE MODULE24	×				D
P338D	CELL OVER DISCHARGE MODULE25	×				
P338E	CELL OVER DISCHARGE MODULE26	×				E
P338F	CELL OVER DISCHARGE MODULE27	×				
P3390	CELL OVER DISCHARGE MODULE28	×				
P3391	CELL OVER DISCHARGE MODULE29	×				F
P3392	CELL OVER DISCHARGE MODULE30	×				
P3393	CELL OVER DISCHARGE MODULE31	×				G
P3394	CELL OVER DISCHARGE MODULE32	×				
P3395	CELL OVER DISCHARGE MODULE33	×				
P3396	CELL OVER DISCHARGE MODULE34	×				H
P3397	CELL OVER DISCHARGE MODULE35	×				
P3398	CELL OVER DISCHARGE MODULE36	×				I
P3399	CELL OVER DISCHARGE MODULE37	×				
P339A	CELL OVER DISCHARGE MODULE38	×				J
P339B	CELL OVER DISCHARGE MODULE39	×				
P339C	CELL OVER DISCHARGE MODULE40	×				
P339D	CELL OVER DISCHARGE MODULE41	×				K
P339E	CELL OVER DISCHARGE MODULE42	×				
P339F	CELL OVER DISCHARGE MODULE43	×				
P33A0	CELL OVER DISCHARGE MODULE44	×				L
P33A1	CELL OVER DISCHARGE MODULE45	×				
P33A2	CELL OVER DISCHARGE MODULE46	×				
P33A3	CELL OVER DISCHARGE MODULE47	×				M
P33A4	CELL OVER DISCHARGE MODULE48	×				
P33D4	BATTERY INTERNAL RESISTANCE DIAG				×	N
P33D5	CURRENT SENSOR		×			
P33D6	CURRENT SENSOR		×			
P33D7	TEMPERATURE SENSOR			No fail-safe		O
P33D9	TEMPERATURE SENSOR			No fail-safe		
P33DB	TEMPERATURE SENSOR			No fail-safe		P
P33DD	TEMPERATURE SENSOR			No fail-safe		
P33DF	BATT VOLTAGE ISOLATION SEN				×	
P33E0	BATT VOLTAGE ISOLATION SEN				×	
P33E1	BATT VOLTAGE ISOLATION SEN				×	
P33E2	BAT PACK OVER TEMP	×				

EV BATTERY SYSTEM

< ECU DIAGNOSIS INFORMATION >

DTC	CONSULT screen items	Pattern			
		A	B	C	D
P33E4	TEMPERATURE SENSOR	No fail-safe			
P33E5	TEMPERATURE SENSOR	No fail-safe			
P33E6	CELL CONTROLLER			×	
P33E7	CELL CONTROLLER				×
P33ED	BATTERY PARALLEL DIAGNOSIS			×	
U1000	CAN COMM CIRCUIT				×

DTC Index

INFOID:000000007005731

×: Applicable —: Not applicable

DTC	CONSULT screen items	EV system warning lamp	Trip	Reference
P0A0D	HV SYSTEM INTERLOCK ERROR	×	1	EVB-60
P0A1F	BATTERY ENERGY CONTROL MODULE	×	1	EVB-60
P3030	CELL CONT LIN	×	1	EVB-61
P3031	CELL CONT ASIC1	×	1	EVB-62
P3032	CELL CONT ASIC2	×	1	EVB-62
P3033	CELL CONT ASIC3	×	1	EVB-62
P3034	CELL CONT ASIC4	×	1	EVB-62
P3035	CELL CONT ASIC5	×	1	EVB-62
P3036	CELL CONT ASIC6	×	1	EVB-62
P3037	CELL CONT ASIC7	×	1	EVB-62
P3038	CELL CONT ASIC8	×	1	EVB-62
P3039	CELL CONT ASIC9	×	1	EVB-62
P303A	CELL CONT ASIC10	×	1	EVB-62
P303B	CELL CONT ASIC11	×	1	EVB-62
P303C	CELL CONT ASIC12	×	1	EVB-62
P303D	CELL CONT ASIC13	×	1	EVB-62
P303E	CELL CONT ASIC14	×	1	EVB-62
P303F	CELL CONT ASIC15	×	1	EVB-62
P3040	CELL CONT ASIC16	×	1	EVB-62
P3041	CELL CONT ASIC17	×	1	EVB-62
P3042	CELL CONT ASIC18	×	1	EVB-62
P3043	CELL CONT ASIC19	×	1	EVB-62
P3044	CELL CONT ASIC20	×	1	EVB-62
P3045	CELL CONT ASIC21	×	1	EVB-62
P3046	CELL CONT ASIC22	×	1	EVB-62
P3047	CELL CONT ASIC23	×	1	EVB-62
P3048	CELL CONT ASIC24	×	1	EVB-62
P3049	CELL CONT ASIC1 VOLT	×	1	EVB-64
P304A	CELL CONT ASIC2 VOLT	×	1	EVB-64
P304B	CELL CONT ASIC3 VOLT	×	1	EVB-64
P304C	CELL CONT ASIC4 VOLT	×	1	EVB-64
P304D	CELL CONT ASIC5 VOLT	×	1	EVB-64

EV BATTERY SYSTEM

< ECU DIAGNOSIS INFORMATION >

DTC	CONSULT screen items	EV system warning lamp	Trip	Reference	
P304E	CELL CONT ASIC6 VOLT	×	1	EVB-64	A
P304F	CELL CONT ASIC7 VOLT	×	1	EVB-64	B
P3050	CELL CONT ASIC8 VOLT	×	1	EVB-64	
P3051	CELL CONT ASIC9 VOLT	×	1	EVB-64	EVB
P3052	CELL CONT ASIC10 VOLT	×	1	EVB-64	
P3053	CELL CONT ASIC11 VOLT	×	1	EVB-64	
P3054	CELL CONT ASIC12 VOLT	×	1	EVB-64	D
P3055	CELL CONT ASIC13 VOLT	×	1	EVB-64	
P3056	CELL CONT ASIC14 VOLT	×	1	EVB-64	
P3057	CELL CONT ASIC15 VOLT	×	1	EVB-64	E
P3058	CELL CONT ASIC16 VOLT	×	1	EVB-64	
P3059	CELL CONT ASIC17 VOLT	×	1	EVB-64	F
P305A	CELL CONT ASIC18 VOLT	×	1	EVB-64	
P305B	CELL CONT ASIC19 VOLT	×	1	EVB-64	
P305C	CELL CONT ASIC20 VOLT	×	1	EVB-64	G
P305D	CELL CONT ASIC21 VOLT	×	1	EVB-64	
P305E	CELL CONT ASIC22 VOLT	×	1	EVB-64	H
P305F	CELL CONT ASIC23 VOLT	×	1	EVB-64	
P3060	CELL CONT ASIC24 VOLT	×	1	EVB-64	
P3061	CELL BATTERY VOLT	×	1	EVB-66	I
P3062	BYPASS SW	×	1	EVB-67	
P308B	CELL CONT ASIC1 OPEN	×	1	EVB-68	J
P308C	CELL CONT ASIC2 OPEN	×	1	EVB-68	
P308D	CELL CONT ASIC3 OPEN	×	1	EVB-68	
P308E	CELL CONT ASIC4 OPEN	×	1	EVB-68	K
P308F	CELL CONT ASIC5 OPEN	×	1	EVB-68	
P3090	CELL CONT ASIC6 OPEN	×	1	EVB-68	L
P3091	CELL CONT ASIC7 OPEN	×	1	EVB-68	
P3092	CELL CONT ASIC8 OPEN	×	1	EVB-68	
P3093	CELL CONT ASIC9 OPEN	×	1	EVB-68	M
P3094	CELL CONT ASIC10 OPEN	×	1	EVB-68	
P3095	CELL CONT ASIC11 OPEN	×	1	EVB-68	
P3096	CELL CONT ASIC12 OPEN	×	1	EVB-68	N
P3097	CELL CONT ASIC13 OPEN	×	1	EVB-68	
P3098	CELL CONT ASIC14 OPEN	×	1	EVB-68	O
P3099	CELL CONT ASIC15 OPEN	×	1	EVB-68	
P309A	CELL CONT ASIC16 OPEN	×	1	EVB-68	
P309B	CELL CONT ASIC17 OPEN	×	1	EVB-68	P
P309C	CELL CONT ASIC18 OPEN	×	1	EVB-68	
P309D	CELL CONT ASIC19 OPEN	×	1	EVB-68	
P309E	CELL CONT ASIC20 OPEN	×	1	EVB-68	
P309F	CELL CONT ASIC21 OPEN	×	1	EVB-68	
P30A0	CELL CONT ASIC22 OPEN	×	1	EVB-68	

EV BATTERY SYSTEM

< ECU DIAGNOSIS INFORMATION >

DTC	CONSULT screen items	EV system warning lamp	Trip	Reference
P30A1	CELL CONT ASIC23 OPEN	×	1	EVB-68
P30A2	CELL CONT ASIC24 OPEN	×	1	EVB-68
P30F3	TOTAL VOLT SENSOR	×	1	EVB-74
P30F4	TOTAL VOLT SENSOR	×	1	EVB-75
P30F5	TOTAL VOLT SENSOR	×	1	EVB-77
P30FC	OVER CURRENT	×	1	EVB-78
P30FD	TOTAL VOLTAGE MONITOR SWITCH	—	1	EVB-79
P30FE	12V BATTERY VOLTAGE	×	1	EVB-80
P318D	COMMUNICATION ERROR	×	1	EVB-82
P318E	COMMUNICATION ERROR	×	1	EVB-83
P3191	COMMUNICATION ERROR	—	1	EVB-84
P3196	COMMUNICATION ERROR	—	1	EVB-85
P3199	COMMUNICATION ERROR	×	1	EVB-86
P319C	COMMUNICATION ERROR	—	1	EVB-87
P31A4	CAN ERROR VCM	×	1	EVB-88
P31A7	CAN ERROR INV/MC	—	1	EVB-89
P3300	TOTAL VOLTAGE OVER	×	1	EVB-90
P3302	CELL OVER VOLTAGE MODULE1	×	1	EVB-91
P3303	CELL OVER VOLTAGE MODULE2	×	1	EVB-91
P3304	CELL OVER VOLTAGE MODULE3	×	1	EVB-91
P3305	CELL OVER VOLTAGE MODULE4	×	1	EVB-91
P3306	CELL OVER VOLTAGE MODULE5	×	1	EVB-91
P3307	CELL OVER VOLTAGE MODULE6	×	1	EVB-91
P3308	CELL OVER VOLTAGE MODULE7	×	1	EVB-91
P3309	CELL OVER VOLTAGE MODULE8	×	1	EVB-91
P330A	CELL OVER VOLTAGE MODULE9	×	1	EVB-91
P330B	CELL OVER VOLTAGE MODULE10	×	1	EVB-91
P330C	CELL OVER VOLTAGE MODULE11	×	1	EVB-91
P330D	CELL OVER VOLTAGE MODULE12	×	1	EVB-91
P330E	CELL OVER VOLTAGE MODULE13	×	1	EVB-91
P330F	CELL OVER VOLTAGE MODULE14	×	1	EVB-91
P3310	CELL OVER VOLTAGE MODULE15	×	1	EVB-91
P3311	CELL OVER VOLTAGE MODULE16	×	1	EVB-91
P3312	CELL OVER VOLTAGE MODULE17	×	1	EVB-91
P3313	CELL OVER VOLTAGE MODULE18	×	1	EVB-91
P3314	CELL OVER VOLTAGE MODULE19	×	1	EVB-91
P3315	CELL OVER VOLTAGE MODULE20	×	1	EVB-91
P3316	CELL OVER VOLTAGE MODULE21	×	1	EVB-91
P3317	CELL OVER VOLTAGE MODULE22	×	1	EVB-91
P3318	CELL OVER VOLTAGE MODULE23	×	1	EVB-91
P3319	CELL OVER VOLTAGE MODULE24	×	1	EVB-91
P331A	CELL OVER VOLTAGE MODULE25	×	1	EVB-91
P331B	CELL OVER VOLTAGE MODULE26	×	1	EVB-91

EV BATTERY SYSTEM

< ECU DIAGNOSIS INFORMATION >

DTC	CONSULT screen items	EV system warning lamp	Trip	Reference	
P331C	CELL OVER VOLTAGE MODULE27	×	1	EVB-91	A
P331D	CELL OVER VOLTAGE MODULE28	×	1	EVB-91	B
P331E	CELL OVER VOLTAGE MODULE29	×	1	EVB-91	
P331F	CELL OVER VOLTAGE MODULE30	×	1	EVB-91	
P3320	CELL OVER VOLTAGE MODULE31	×	1	EVB-91	EVB
P3321	CELL OVER VOLTAGE MODULE32	×	1	EVB-91	
P3322	CELL OVER VOLTAGE MODULE33	×	1	EVB-91	D
P3323	CELL OVER VOLTAGE MODULE34	×	1	EVB-91	
P3324	CELL OVER VOLTAGE MODULE35	×	1	EVB-91	
P3325	CELL OVER VOLTAGE MODULE36	×	1	EVB-91	E
P3326	CELL OVER VOLTAGE MODULE37	×	1	EVB-91	
P3327	CELL OVER VOLTAGE MODULE38	×	1	EVB-91	F
P3328	CELL OVER VOLTAGE MODULE39	×	1	EVB-91	
P3329	CELL OVER VOLTAGE MODULE40	×	1	EVB-91	
P332A	CELL OVER VOLTAGE MODULE41	×	1	EVB-91	G
P332B	CELL OVER VOLTAGE MODULE42	×	1	EVB-91	
P332C	CELL OVER VOLTAGE MODULE43	×	1	EVB-91	
P332D	CELL OVER VOLTAGE MODULE44	×	1	EVB-91	H
P332E	CELL OVER VOLTAGE MODULE45	×	1	EVB-91	
P332F	CELL OVER VOLTAGE MODULE46	×	1	EVB-91	I
P3330	CELL OVER VOLTAGE MODULE47	×	1	EVB-91	
P3331	CELL OVER VOLTAGE MODULE48	×	1	EVB-91	J
P3373	TOTAL VOLTAGE OVER DISCHARGE	×	1	EVB-103	
P3375	CELL OVER DISCHARGE MODULE1	×	1	EVB-104	
P3376	CELL OVER DISCHARGE MODULE2	×	1	EVB-104	K
P3377	CELL OVER DISCHARGE MODULE3	×	1	EVB-104	
P3378	CELL OVER DISCHARGE MODULE4	×	1	EVB-104	
P3379	CELL OVER DISCHARGE MODULE5	×	1	EVB-104	L
P337A	CELL OVER DISCHARGE MODULE6	×	1	EVB-104	
P337B	CELL OVER DISCHARGE MODULE7	×	1	EVB-104	M
P337C	CELL OVER DISCHARGE MODULE8	×	1	EVB-104	
P337D	CELL OVER DISCHARGE MODULE9	×	1	EVB-104	
P337E	CELL OVER DISCHARGE MODULE10	×	1	EVB-104	N
P337F	CELL OVER DISCHARGE MODULE11	×	1	EVB-104	
P3380	CELL OVER DISCHARGE MODULE12	×	1	EVB-104	O
P3381	CELL OVER DISCHARGE MODULE13	×	1	EVB-104	
P3382	CELL OVER DISCHARGE MODULE14	×	1	EVB-104	
P3383	CELL OVER DISCHARGE MODULE15	×	1	EVB-104	P
P3384	CELL OVER DISCHARGE MODULE16	×	1	EVB-104	
P3385	CELL OVER DISCHARGE MODULE17	×	1	EVB-104	
P3386	CELL OVER DISCHARGE MODULE18	×	1	EVB-104	
P3387	CELL OVER DISCHARGE MODULE19	×	1	EVB-104	
P3388	CELL OVER DISCHARGE MODULE20	×	1	EVB-104	

EV BATTERY SYSTEM

< ECU DIAGNOSIS INFORMATION >

DTC	CONSULT screen items	EV system warning lamp	Trip	Reference
P3389	CELL OVER DISCHARGE MODULE21	×	1	EVB-104
P338A	CELL OVER DISCHARGE MODULE22	×	1	EVB-104
P338B	CELL OVER DISCHARGE MODULE23	×	1	EVB-104
P338C	CELL OVER DISCHARGE MODULE24	×	1	EVB-104
P338D	CELL OVER DISCHARGE MODULE25	×	1	EVB-104
P338E	CELL OVER DISCHARGE MODULE26	×	1	EVB-104
P338F	CELL OVER DISCHARGE MODULE27	×	1	EVB-104
P3390	CELL OVER DISCHARGE MODULE28	×	1	EVB-104
P3391	CELL OVER DISCHARGE MODULE29	×	1	EVB-104
P3392	CELL OVER DISCHARGE MODULE30	×	1	EVB-104
P3393	CELL OVER DISCHARGE MODULE31	×	1	EVB-104
P3394	CELL OVER DISCHARGE MODULE32	×	1	EVB-104
P3395	CELL OVER DISCHARGE MODULE33	×	1	EVB-104
P3396	CELL OVER DISCHARGE MODULE34	×	1	EVB-104
P3397	CELL OVER DISCHARGE MODULE35	×	1	EVB-104
P3398	CELL OVER DISCHARGE MODULE36	×	1	EVB-104
P3399	CELL OVER DISCHARGE MODULE37	×	1	EVB-104
P339A	CELL OVER DISCHARGE MODULE38	×	1	EVB-104
P339B	CELL OVER DISCHARGE MODULE39	×	1	EVB-104
P339C	CELL OVER DISCHARGE MODULE40	×	1	EVB-104
P339D	CELL OVER DISCHARGE MODULE41	×	1	EVB-104
P339E	CELL OVER DISCHARGE MODULE42	×	1	EVB-104
P339F	CELL OVER DISCHARGE MODULE43	×	1	EVB-104
P33A0	CELL OVER DISCHARGE MODULE44	×	1	EVB-104
P33A1	CELL OVER DISCHARGE MODULE45	×	1	EVB-104
P33A2	CELL OVER DISCHARGE MODULE46	×	1	EVB-104
P33A3	CELL OVER DISCHARGE MODULE47	×	1	EVB-104
P33A4	CELL OVER DISCHARGE MODULE48	×	1	EVB-104
P33D4	BATTERY INTERNAL RESISTANCE DIAG	×	1	EVB-116
P33D5	CURRENT SENSOR	×	1	EVB-117
P33D6	CURRENT SENSOR	×	1	EVB-119
P33D7	TEMPERATURE SENSOR	—	1	EVB-121
P33D9	TEMPERATURE SENSOR	—	1	EVB-121
P33DB	TEMPERATURE SENSOR	—	1	EVB-121
P33DD	TEMPERATURE SENSOR	—	1	EVB-121
P33DF	IR VOLTAGE	×	1	EVB-123
P33E0	BATT VOLTAGE ISOLATION SEN	×	1	EVB-124
P33E1	BATT VOLTAGE ISOLATION SEN	×	1	EVB-125
P33E2	BAT PACK OVER TEMP	×	1	EVB-126
P33E4	TEMPERATURE SENSOR	—	1	EVB-127
P33E5	TEMPERATURE SENSOR	—	1	EVB-127
P33E6	CELL CONTROLLER	×	2	EVB-129
P33E7	CELL CONTROLLER	×	1	EVB-130

EV BATTERY SYSTEM

< ECU DIAGNOSIS INFORMATION >

DTC	CONSULT screen items	EV system warning lamp	Trip	Reference
P33ED	BATTERY PARALLEL DIAGNOSIS	×	1	EVB-131
U1000	CAN COMM CIRCUIT	×	1	EVB-132

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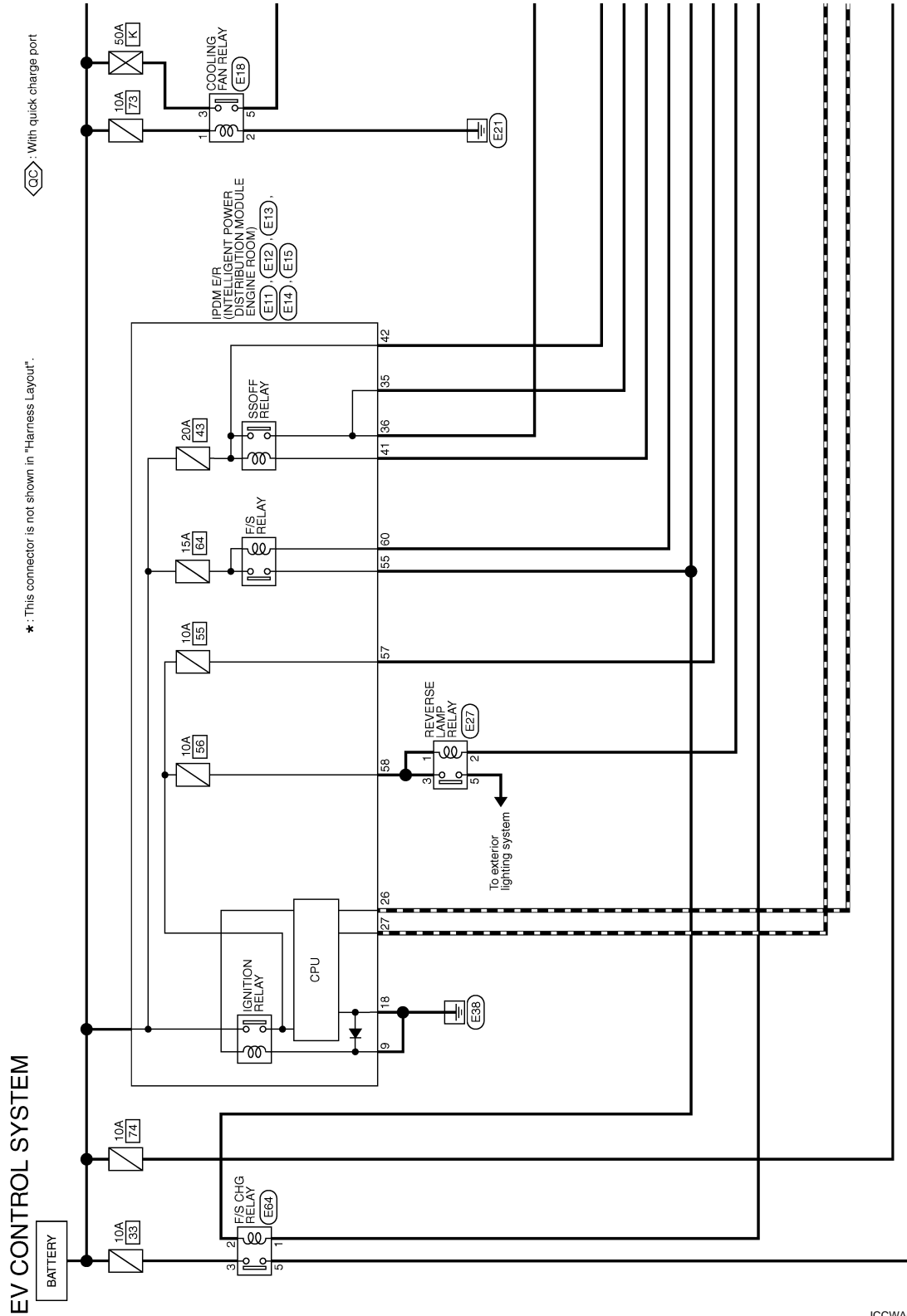
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WIRING DIAGRAM

VCM

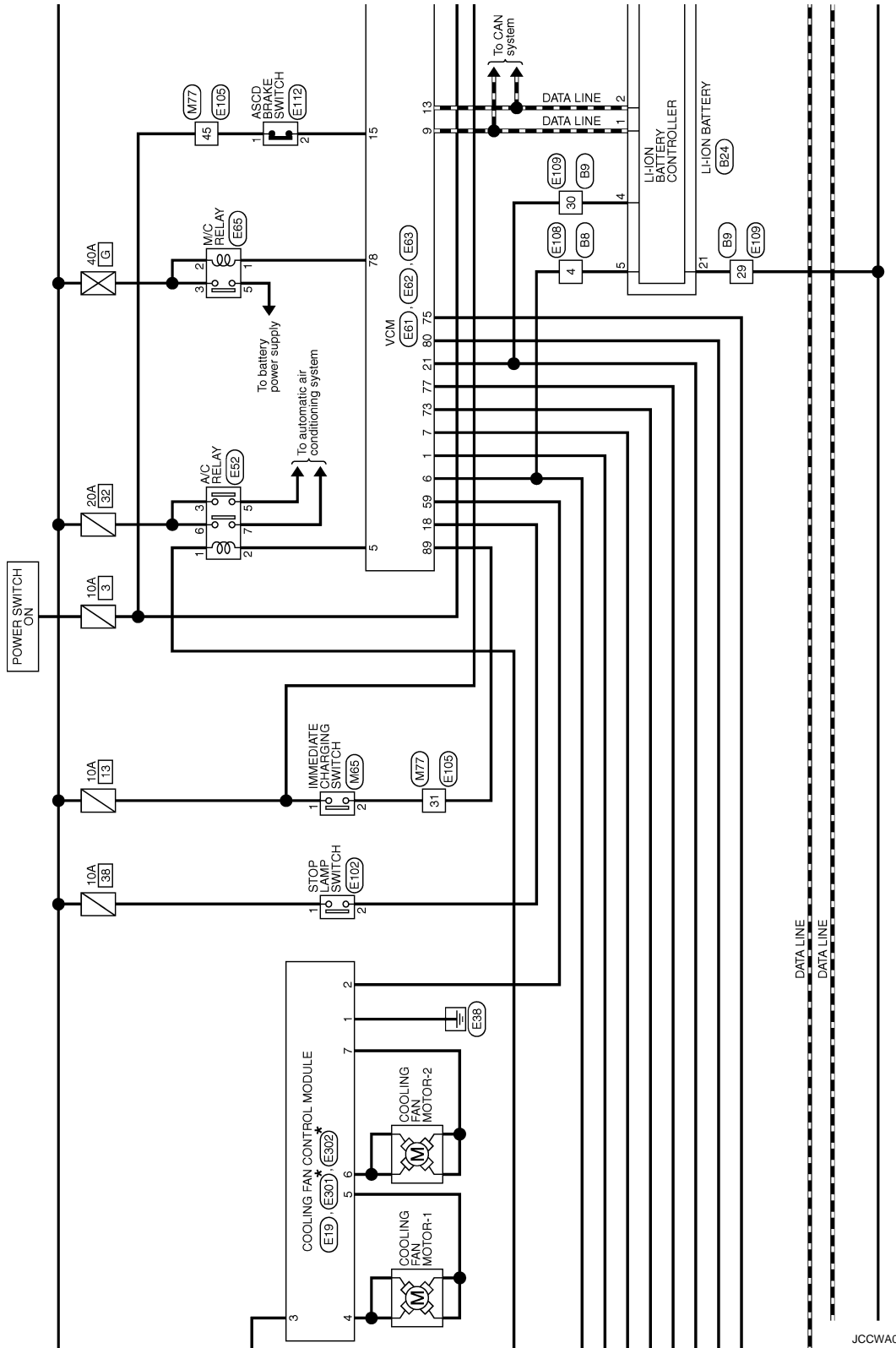
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VCM

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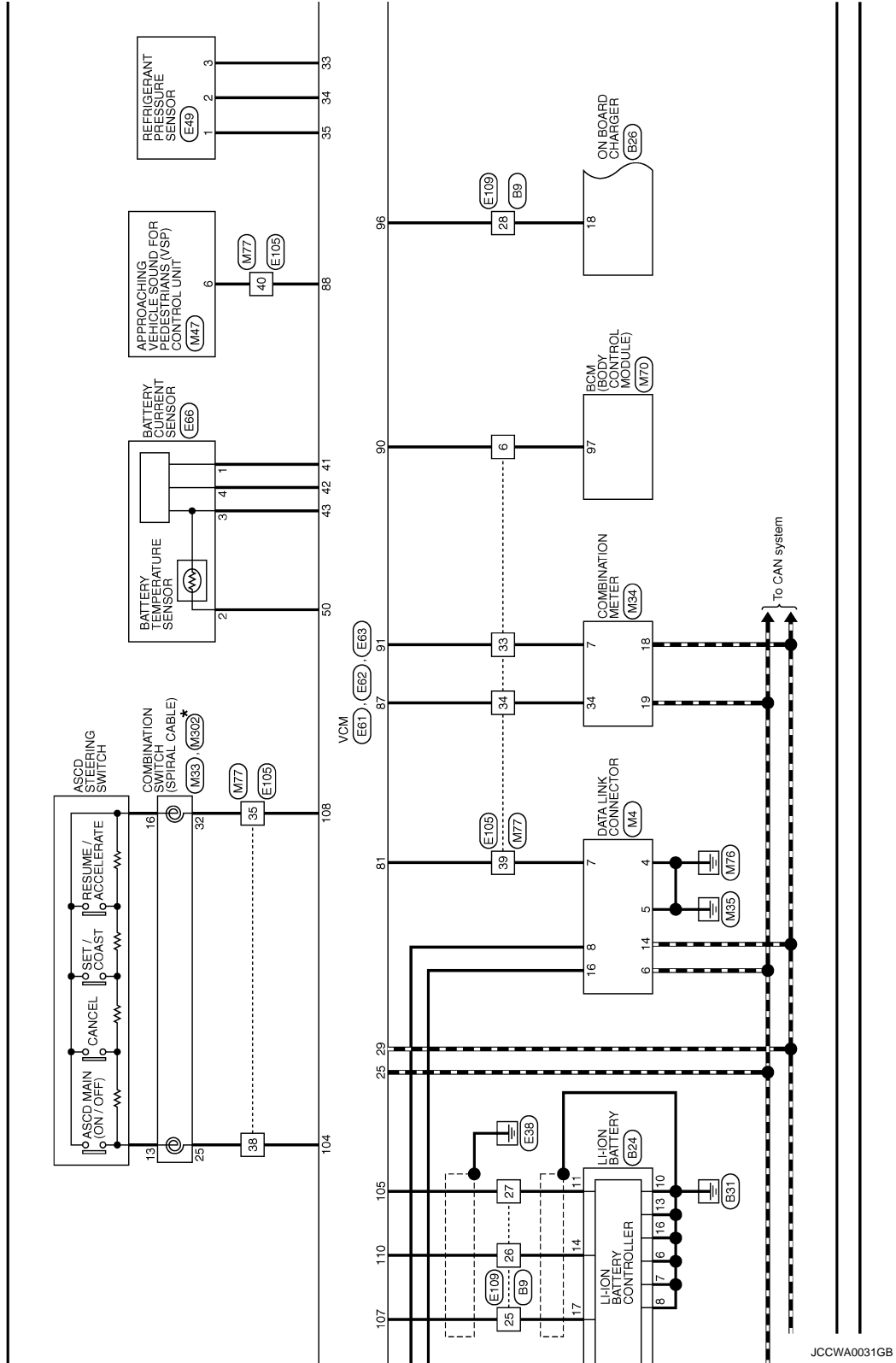


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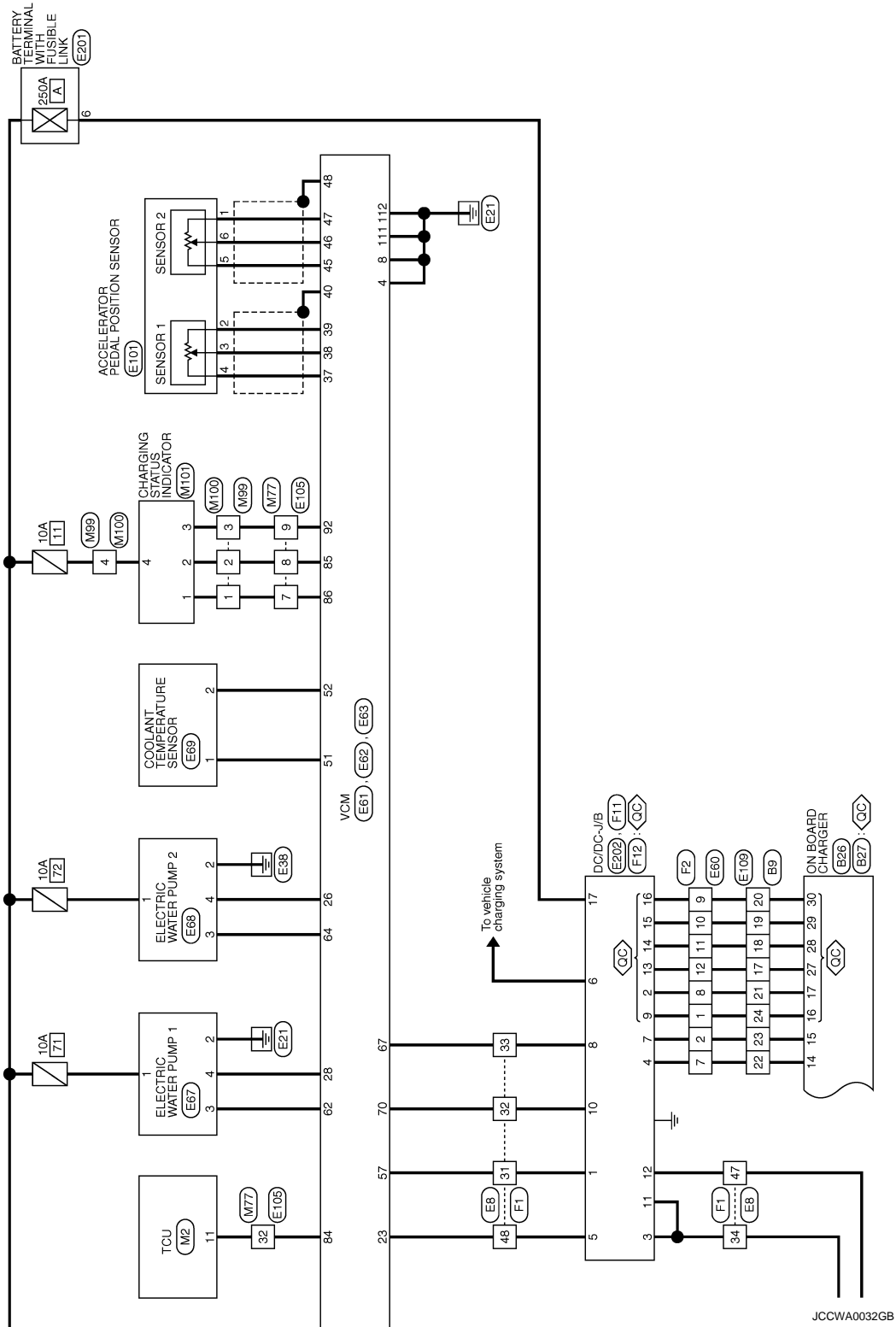
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VCM

< WIRING DIAGRAM >



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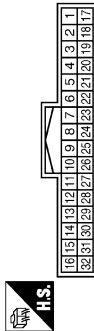
EV CONTROL SYSTEM

Connector No.	B8
Connector Name	WIRE TO WIRE
Connector Type	MS04FW-GS



Terminal No.	Color of Wire	Signal Name [Specification]
1	R	
2	L	
3	R	
4	R	

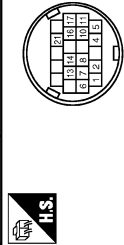
Connector No.	B9
Connector Name	WIRE TO WIRE
Connector Type	TH32FW-BH



Terminal No.	Color of Wire	Signal Name [Specification]
1	W	
2	GR	
3	Y	
4	G	
5	BR	
6	L	
7	B	
8	P	
9	SB	
10	LG	
11	W	
17	R	
18	Y	
19	G	
20	V	
21	P	
22	P	
23	LG	

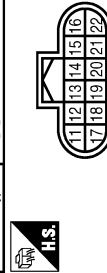
24	L	
25	Y	
26	L	
27	G	
28	GR	
29	R	
30	R	
31	Y	

Connector No.	B24
Connector Name	LI-ION BATTERY
Connector Type	Yazaki: 7283-8750-30



Terminal No.	Color of Wire	Signal Name [Specification]
1	L	EV CAN-H
2	G	EV CAN-L
4	R	IGN
5	R	BAT
6	B	GND3
7	B	GND2
8	B	GND1
10	B	PRE CHG V
11	G	PRE CHG V
13	B	RLY2 GND
14	L	RLY2 V
16	B	RLY1 GND
17	Y	RLY1 V
21	R	CHG IGN

Connector No.	B26
Connector Name	ON BOARD CHARGER
Connector Type	RH12FB



Terminal No.	Color of Wire	Signal Name [Specification]
11	Y	BATTERY POWER SUPPLY
12	W	BATTERY POWER SUPPLY
13	V	POWER ON POWER SUPPLY
14	P	NORMAL CHARGE RELAY +
15	LG	NORMAL CHARGE RELAY -
16	L	QUICK CHARGE RELAY +
17	SB	QUICK CHARGE RELAY -
18	GR	EV ACTIVATION REQUEST SIGNAL
19	L	EV SYSTEM CAN-H
20	G	EV SYSTEM CAN-L
21	BR	PLUG IN SIGNAL
22	B	GROUND

Connector No.	B27
Connector Name	ON BOARD CHARGER
Connector Type	RR08FB



Terminal No.	Color of Wire	Signal Name [Specification]
25	W	QUICK CHARGE PORT TEMPERATURE SENSOR SIGNAL 1
26	GR	QUICK CHARGE PORT TEMPERATURE SENSOR SIGNAL 2
27	R	QUICK CHARGE VOLTAGE SENSOR SIGNAL-L
28	Y	SENSOR POWER SUPPLY QUICK CHARGE VOLTAGE SENSOR
29	G	SENSOR GROUND QUICK CHARGE VOLTAGE SENSOR
30	V	QUICK CHARGE VOLTAGE SENSOR SIGNAL-H

Connector No.	E8
Connector Name	WIRE TO WIRE
Connector Type	SAASMB-RS10-S22



Terminal No.	Color of Wire	Signal Name [Specification]
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1	Y	
2	L	
3	GR	
4	LG	
5	P	
6	B	
8	BR	
10	B	
11	W	
12	O	
13	G	
14	V	
15	SB	
16	R	
17	L	
18	LG	
20	V	
21	G	
22	Y	
23	B/R	
26	V	
27	B	
28	B/R	
29	W	
30	B/R	
31	LG	
32	W	
33	Y	
34	P	
35	P	
36	R	
37	G	
38	B/R	
40	BR	
41	G	
42	SB	
43	L	
44	O	
47	V	
48	P	

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EV CONTROL SYSTEM

Connector No.	E11
Connector Name	FROM E/R INTELLIGENT POWER DISTRIBUTION MODULE (ENGINE ROOM)
Connector Type	MS08FB-LC



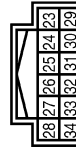
Terminal No.	Color of Wire	Signal Name [Specification]
9	B	
14	R	

Connector No.	E12
Connector Name	FROM E/R INTELLIGENT POWER DISTRIBUTION MODULE (ENGINE ROOM)
Connector Type	NS08FBR-CS



Terminal No.	Color of Wire	Signal Name [Specification]
18	B/W	
19	W	
20	V	

Connector No.	E13
Connector Name	FROM E/R INTELLIGENT POWER DISTRIBUTION MODULE (ENGINE ROOM)
Connector Type	TH12FW-NH



Terminal No.	Color of Wire	Signal Name [Specification]
25	R	

26	P	
27	L	
34	W	

Connector No.	E14
Connector Name	FROM E/R INTELLIGENT POWER DISTRIBUTION MODULE (ENGINE ROOM)
Connector Type	NS12FBR-CS



Terminal No.	Color of Wire	Signal Name [Specification]
35	G	
36	GR	
38	V	
39	L	
41	W	
42	R	
43	O	
44	LG	
45	Y	

Connector No.	E15
Connector Name	FROM E/R INTELLIGENT POWER DISTRIBUTION MODULE (ENGINE ROOM)
Connector Type	NS16FW-CS



Terminal No.	Color of Wire	Signal Name [Specification]
49	Y	
50	G	
51	L	
52	P	
55	LG	
57	R	
58	O	
60	GR	

61	Y	
62	V	

Connector No.	E18
Connector Name	COOLING FAN RELAY
Connector Type	24347_9F-900



Terminal No.	Color of Wire	Signal Name [Specification]
1	G	
2	B/Y	
3	BR	
5	R	

Connector No.	E19
Connector Name	COOLING FAN CONTROL MODULE
Connector Type	SJZ01FGY-SNZ2



Terminal No.	Color of Wire	Signal Name [Specification]
1	B	GND
2	V	PWM SIG
3	R	PWM POWER

Connector No.	E27
Connector Name	REVERSE LAMP RELAY
Connector Type	MS02FL-MZ-LC



Terminal No.	Color of Wire	Signal Name [Specification]
1	O	
2	SB	
3	O	
5	G	

Connector No.	E49
Connector Name	REFRIGERANT PRESSURE SENSOR
Connector Type	RK03FB



Terminal No.	Color of Wire	Signal Name [Specification]
2	BR	
3	L	

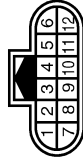
EV CONTROL SYSTEM

Connector No.	E52
Connector Name	A/C RELAY
Connector Type	M08FBR-R-LC



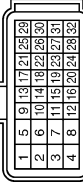
Terminal No.	Color of Wire	Signal Name [Specification]
1	GR	-
2	SB	-
3	R	-
4	R	-
5	V	-
6	R	-
7	W	-

Connector No.	E60
Connector Name	WIRE TO WIRE
Connector Type	RH12MB



Terminal No.	Color of Wire	Signal Name [Specification]
1	Y	-
2	G	-
3	L	-
4	G	-
5	L	-
6	G	-
7	L	-
8	SB	-
9	V	-
10	O	-
11	BR	-
12	LG	-

Connector No.	E61
Connector Name	VCM
Connector Type	RH24FGV-R28-L-RH



Terminal No.	Color of Wire	Signal Name [Specification]
1	G	POWER ON POWER SUPPLY
4	B/R	GROUND
5	SB	A/C RELAY
6	R	BATTERY POWER SUPPLY
7	W	SSOFF RELAY
8	B/R	GROUND
9	L	EV SYSTEM CAN-H
10	G	EV SYSTEM CAN-L
13	O	ASCD BRAKE SWITCH SIGNAL
16	SB	STOP LAMP SW SIGNAL
21	R	POWER ON POWER SUPPLY
23	P	HIGH VOLTAGE CABLE INTERLOCK
25	L	CAN-H
26	Y	WATER PUMP 2 SIGNAL
28	W	WATER PUMP 1 SIGNAL
29	P	CAN-L

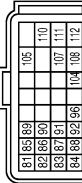
Connector No.	E62
Connector Name	VCM
Connector Type	RH40FBR-R28-L-RH



Terminal No.	Color of Wire	Signal Name [Specification]
33	L	SENSOR POWER SUPPLY (REFRIGERANT PRESSURE SENSOR)
34	BR	REFRIGERANT PRESSURE SENSOR SIGNAL
35	BR	SENSOR GROUND (REFRIGERANT PRESSURE SENSOR)
37	W	SENSOR POWER SUPPLY (ACCELERATOR PEDAL POSITION SENSOR)
38	R	ACCELERATOR PEDAL POSITION SENSOR 1 SIGNAL
39	B	SENSOR GROUND (ACCELERATOR PEDAL POSITION SENSOR 1)

Terminal No.	Color of Wire	Signal Name [Specification]
40	SHIELD	-
41	R	SENSOR POWER SUPPLY (BATTERY CURRENT SENSOR)
42	Y	BATTERY CURRENT SENSOR SIGNAL
43	L	SENSOR GROUND (BATTERY CURRENT SENSOR)
45	W	ACCELERATOR PEDAL POSITION SENSOR 2 SIGNAL
46	R	ACCELERATOR PEDAL POSITION SENSOR 2 SIGNAL
47	B	SENSOR GROUND (ACCELERATOR PEDAL POSITION SENSOR 2)
48	SHIELD	-
50	L	BATTERY TEMPERATURE SENSOR SIGNAL
51	O	COOLANT TEMPERATURE SENSOR SIGNAL
52	W	SENSOR GROUND (COOLANT TEMPERATURE SENSOR)
57	LG	POWER VOLTAGE VARIABLE CONTROL SIGNAL
59	V	RADIATOR FAN CONTROL SIGNAL
62	G	WATER PUMP 1 ACTIVATION SIGNAL
64	R	WATER PUMP 2 ACTIVATION SIGNAL
67	Y	DC/DC CONVERTER TEMPERATURE SIGNAL
70	W	DC/DC CONVERTER ACTIVATION SIGNAL
73	GR	F/S RELAY
75	W	F/S CHG RELAY
77	LG	F/S RELAY POWER SUPPLY
78	G	M/C RELAY
80	SB	REVERSE LAMP RELAY

Connector No.	E63
Connector Name	VCM
Connector Type	RH24FBR-R28-L-RH



Terminal No.	Color of Wire	Signal Name [Specification]
81	GR	K-LINE
84	LG	EV SYSTEM ACTIVATION REQUEST SIGNAL
85	P	CHARGING STATUS INDICATOR 2
86	V	CHARGING STATUS INDICATOR 1
87	L	PLUG IN INDICATOR LAMP
88	Y	AVSP CONTROL SIGNAL
89	V	IMMEDIATE CHARGING SWITCH
90	W	STARTER RELAY CONT
91	O	ELECTRIC SHIF WARNING SIGNAL
92	G	CHARGING STATUS INDICATOR 3
96	GR	EV SYSTEM ACTIVATION REQUEST SIGNAL
104	SB	ASCD STEERING SWITCH
105	L/O	PRE-CHARGE RELAY
107	W/L	SYSTEM MAIN RELAY 1

108	BR	ASCD STIRRING SWICH GROUND
110	L/Y	SYSTEM MAIN RELAY 2
111	B/R	GROUND
112	B/R	GROUND

Connector No.	E64
Connector Name	F/S CHG RELAY
Connector Type	MS02FL-M2-LC



Terminal No.	Color of Wire	Signal Name [Specification]
1	W	-
2	LG	-
3	W	-
5	V	-

Connector No.	E65
Connector Name	M/C RELAY
Connector Type	MS02FL-M2-LC



Terminal No.	Color of Wire	Signal Name [Specification]
1	G	-
2	R	-
3	R	-
5	W	-

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EV CONTROL SYSTEM

Connector No.	EB6
Connector Name	BATTERY CURRENT SENSOR
Connector Type	SAZ04FGY



Terminal No.	Color of Wire	Signal Name [Specification]
1	R	-
2	L	-
3	L	-
4	Y	-

Connector No.	EB7
Connector Name	ELECTRIC WATER PUMP 1
Connector Type	RSDMFG



Terminal No.	Color of Wire	Signal Name [Specification]
1	BR	-
2	B/Y	-
3	G	-
4	W	-

Connector No.	EB8
Connector Name	ELECTRIC WATER PUMP 2
Connector Type	RSDMFG



Terminal No.	Color of Wire	Signal Name [Specification]
1	L	-
2	B/W	-
3	R	-
4	Y	-



Connector No.	EB9
Connector Name	COOLANT TEMPERATURE SENSOR
Connector Type	EDZFGY-RS



Terminal No.	Color of Wire	Signal Name [Specification]
1	O	-
2	W	-



Connector No.	EI01
Connector Name	ACCELERATOR PEDAL POSITION SENSOR
Connector Type	RHD0FB



Terminal No.	Color of Wire	Signal Name [Specification]
1	B	-
2	B	-
3	R	-
4	W	-
5	W	-
6	R	-

Connector No.	EI02
Connector Name	STOP LAMP SWITCH
Connector Type	JM04FW-LC



Terminal No.	Color of Wire	Signal Name [Specification]
1	W	-
2	SR	-
3	LG	-
4	P	-

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EV CONTROL SYSTEM

Connector No.	E105
Connector Name	WIRE TO WIRE
Connector Type	TH80MW-GS16-TM4



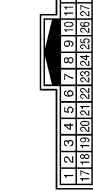
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1	BR	-
2	R	-
3	GR	-
4	LG	-
5	W	-
6	LG	-
7	V	-
8	P	-
9	G	-
10	R	-
11	O	-
12	W	-
13	B	-
14	Y	-
15	BR	-
16	LG	-
17	L	-
19	G	-
20	V	-
21	P	-
22	LG	-
23	GR	-
24	L	-
25	R	-
26	SB	-
27	B	-
28	BR	-
29	W	-
30	W	-
31	V	-
32	LG	-
33	O	-
34	L	-
35	BR	-
38	SB	-
39	GR	-
40	Y	-
41	R	-
42	W	-
43	SB	-

Connector No.	E108
Connector Name	WIRE TO WIRE
Connector Type	NS5MMH-GS



Terminal No.	Color of Wire	Signal Name [Specification]
1	W	-
2	R	-
3	L	-
4	R	-

Connector No.	E109
Connector Name	WIRE TO WIRE
Connector Type	TH82MW-NH



Terminal No.	Color of Wire	Signal Name [Specification]
1	W	-
2	R	-
3	Y	-
4	G	-
5	BR	-
6	L	-
7	O	-
8	V	-
9	SB	-
10	LG	-
11	L	-
17	LG	-
18	BR	-
19	O	-
20	V	-
21	SB	-
22	L	-
23	G	-

24	Y	-
25	W/L	-
26	L/Y	-
27	L/O	-
28	GR	-
29	P	-
30	R	-
31	W	-

Connector No.	E112
Connector Name	ASC D BRAKE SWITCH
Connector Type	MD2FER-LC



Terminal No.	Color of Wire	Signal Name [Specification]
1	G	-
2	O	-

Connector No.	E201
Connector Name	BATTERY TERMINAL WITH FUSIBLE LINK
Connector Type	-



Terminal No.	Color of Wire	Signal Name [Specification]
6	B/R	-

EV CONTROL SYSTEM

Connector No.	E202
Connector Name	DC/DC-J/B
Connector Type	-



Terminal No.	Color of Wire	Signal Name [Specification]
17	B/R	BATTERY POWER SUPPLY

Connector No.	E301
Connector Name	COOLING FAN CONTROL MODULE (COOLING FAN MOTOR-1)
Connector Type	6188-0239



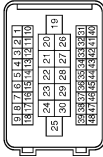
Terminal No.	Color of Wire	Signal Name [Specification]
4	-	-
5	-	-

Connector No.	E302
Connector Name	COOLING FAN CONTROL MODULE (COOLING FAN MOTOR-2)
Connector Type	6188-0239



Terminal No.	Color of Wire	Signal Name [Specification]
6	-	-
7	-	-

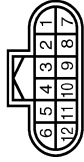
Connector No.	F1
Connector Name	WIRE TO WIRE
Connector Type	SA33PEF-RS10-SJ22



Terminal No.	Color of Wire	Signal Name [Specification]
1	Y	-
2	L	-
3	GR	-
4	LG	-
5	P	-
6	B	-
8	W	-
10	R	-
11	W	-
12	O	-
13	G	-
14	V	-
15	SB	-
16	LG	-
17	BR	-
18	Y	-
20	V	-
21	G	-
22	LG	-
23	B	-
26	SB	-
27	R	-
28	Y	-
29	W	-
30	P	-
31	L	-
32	W	-
33	Y	-
34	R	-
35	G	-
36	LG	-
37	O	-
37	O	- [With quick charge port]
37	O	- [Without quick charge port]
38	B	-
40	BR	-
41	O	-
42	SB	-
43	L	-

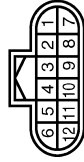
44	LG	-
47	V	-
48	P	-

Connector No.	F2
Connector Name	WIRE TO WIRE
Connector Type	RH1ZFB



Terminal No.	Color of Wire	Signal Name [Specification]
1	L/W	-
2	LG	-
3	L	-
4	G	-
5	L	-
6	G	-
7	V	-
8	Y/V	-
9	V	-
10	O	-
11	R/Y	-
12	W/R	-

Connector No.	F11
Connector Name	DC/DC-J/B
Connector Type	RH1ZFB



Terminal No.	Color of Wire	Signal Name [Specification]
1	L	-
2	Y/V	-
3	R	-
4	V	-
5	P	-

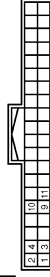
6	O	-
7	LG	-
8	Y	-
9	L/W	-
10	W	-
11	R	BATTERY POWER SUPPLY
12	V	QUICK CHARGE RELAY POWER SUPPLY

Connector No.	F12
Connector Name	DC/DC-J/B
Connector Type	RH04FB



Terminal No.	Color of Wire	Signal Name [Specification]
13	W/R	-
14	R/Y	-
15	O	-
16	V	-

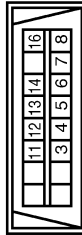
Connector No.	M2
Connector Name	TCU
Connector Type	TH06PW-RH



Terminal No.	Color of Wire	Signal Name [Specification]
1	BR	BATTERY POWER SUPPLY
2	B	GROUND
3	G	ACC POWER SUPPLY
4	V	POWER SWITCH ON SIGNAL
9	L	EV SYSTEM CAN-H
10	G	EV SYSTEM CAN-L
11	LG	EV SYSTEM ACTIVATION REQUEST SIGNAL

EV CONTROL SYSTEM

Connector No.	M4
Connector Name	DATA LINK CONNECTOR
Connector Type	BD18EV



Terminal No.	Color of Wire	Signal Name [Specification]
3	LG	-
4	B	-
5	B	-
6	L	-
7	GR	-
8	G	-
11	SB	-
12	G	-
13	L	-
14	P	-
16	Y	-

Connector No.	M33
Connector Name	COMBINATION SWITCH (SPIRAL CABLE)
Connector Type	TK08FCY-1V



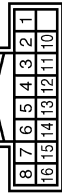
Terminal No.	Color of Wire	Signal Name [Specification]
24	BR	-
25	LG	-
26	B	-
31	Y	-
32	SB	-
33	SHIELD	-
34	G	-

Connector No.	M34
Connector Name	COMBINATION METER
Connector Type	TH40FPV-NH



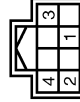
Terminal No.	Color of Wire	Signal Name [Specification]
1	LG	BATTERY POWER SUPPLY
2	R	BATTERY POWER SUPPLY (FOR UPPER METER)
3	GR	POWER SWITCH SUPPLY
4	L	POWER SWITCH SUPPLY (FOR UPPER METER)
5	B	GROUND
6	B	GROUND
7	V	ELECTRIC SHIFT WARNING SIGNAL
9	G	PLUG IN SIGNAL
10	L	COMMUNICATION SIGNAL (METER → VSP)
11	P	COMMUNICATION SIGNAL (VSP → METER)
12	V	METER CONTROL SWITCH GROUND
13	LG	ENTER SWITCH SIGNAL
14	W	SELECT SWITCH SIGNAL
15	BR	TRIP RESET SWITCH SIGNAL
16	BR	ILLUMINATION CONTROL SWITCH SIGNAL
17	V	ILLUMINATION CONTROL SIGNAL (FOR UPPER METER)
18	P	CAN-L
19	L	CAN-H
20	V	SEAT BELT BUCKLE SWITCH SIGNAL (PASSENGER SIDE)
22	GR	GROUND (FOR UPPER METER)
24	BR	ELECTRIC PARKING BRAKE CONTROL MODULE WAKEUP SIGNAL
25	SB	BRAKE FLUID LEVEL SWITCH SIGNAL
26	B	ILLUMINATION CONTROL SIGNAL
27	R	AIR BAG SIGNAL
28	R	SECURITY SIGNAL
30	GR	VEHICLE SPEED SIGNAL (PULSE)
32	W	COMMUNICATION SIGNAL (METER → UPPER)
33	LG	COMMUNICATION SIGNAL (UPPER → METER)
34	L	PLUG IN INDICATOR LAMP SIGNAL
38	V	LED HEADLAMP (RH) WARNING SIGNAL
39	LG	LED HEADLAMP (LH) WARNING SIGNAL
40	Y	SEAT BELT BUCKLE SWITCH SIGNAL (DRIVER SIDE)

Connector No.	M47
Connector Name	APPROACHING VEHICLE SOUND FOR PEDESTRIANS (VSP) CONTROL UNIT
Connector Type	TH18FV-NH



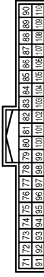
Terminal No.	Color of Wire	Signal Name [Specification]
1	B	GROUND
2	L	COMMUNICATION SIGNAL (METER → VSP)
3	SB	POWER SWITCH SIGNAL
4	P	COMMUNICATION SIGNAL (VSP → METER)
5	G	VSP OFF SWITCH SIGNAL
6	Y	CHARGE PULSE SIGNAL
7	L	VSP SPEAKER SIGNAL (-)
8	Y	VSP SPEAKER SIGNAL (+)
10	GR	R-LINE (CONSULT)
11	R	POWER SWITCH SUPPLY
12	SB	STOP LAMP SWITCH SIGNAL
13	L	BATTERY POWER SUPPLY
14	LG	VSP OFF INDICATOR SIGNAL
15	R	STRAT UP SOUND SPEAKER SIGNAL (-)
16	W	STRAT UP SOUND SPEAKER SIGNAL (+)

Connector No.	M65
Connector Name	IMMEDIATE CHARGING SWITCH
Connector Type	TH08FCY-NH



Terminal No.	Color of Wire	Signal Name [Specification]
1	Y	-
2	SB	-
3	W	ILLUMINATION +
4	B	ILLUMINATION -

Connector No.	M70
Connector Name	BGM (BODY CONTROL MODULE)
Connector Type	TH40FPV-NH



Terminal No.	Color of Wire	Signal Name [Specification]
75	LG	DR DOOR REQ SW
76	SB	POWER SW (PUSH SW)
78	P	DRIVER DOOR ANT-
79	V	DRIVER DOOR ANT+
80	LG	PASS DOOR ANT-
81	Y	PASS DOOR ANT+
82	W	REAR BEMR ANT-
83	B	REAR BEMR ANT+
84	BR	ROOM ANT 1+
85	Y	ROOM ANT 1-
86	G	ROOM ANT 2+
87	R	ROOM ANT 2-
88	V	LUGGAGE ROOM ANT-
89	LG	LUGGAGE ROOM ANT+
90	W	POWER SW ILL PWR
91	V	ACC 7 ON IND
92	B	POWER SW ILL GND CONT
93	GR	I-KEY WARN BUZZER
97	W	ACC RELAY COAT
98	G	READY
99	R	IGN RELAY (PDM F/R) CONT
100	P	IGN RELAY (F/B) CONT
102	R	PASS DOOR REQ SW
104	LG	PA POSITION
106	P	WAKE UP STOP LAMP SW 2

EV CONTROL SYSTEM

Connector No.	M77
Connector Name	WIRE TO WIRE
Connector Type	TH8DFV-C516-TM4



Terminal No.	Color of Wire	Signal Name [Specification]
1	GR	
2	V	
3	GR	
4	LG	
5	W	
6	W	
7	V	
8	P	
9	SB	
10	L	
11	LG	
12	W	
13	R	
14	Y	
15	R	
16	GR	
17	BR	
19	G	
20	G	
21	P	
22	LG	
23	GR	
24	L	
25	V	
26	W	
27	L	
29	V	
30	W	
31	SB	
32	LG	
33	V	
34	L	
35	SB	
38	LG	
39	GR	
40	Y	
41	R	
42	W	
43	SB	

Connector No.	M89
Connector Name	WIRE TO WIRE
Connector Type	TH04FW-NH



Terminal No.	Color of Wire	Signal Name [Specification]
1	V	
2	P	
3	SB	
4	LG	

Terminal No.	Color of Wire	Signal Name [Specification]
1	V	
2	P	
3	SB	
4	L	

Connector No.	M302
Connector Name	COMBINATION SWITCH (SPIRAL CABLE)
Connector Type	TK08FGY



Terminal No.	Color of Wire	Signal Name [Specification]
13	R	
14	W	
15	L	
16	B	
17	BR	
18	G	
19	Y	
20	Y	

Connector No.	M100
Connector Name	WIRE TO WIRE
Connector Type	TH04MW-NH



Terminal No.	Color of Wire	Signal Name [Specification]
1	V	
2	P	
3	SB	
4	L	

Connector No.	M101
Connector Name	CHARGING STATUS INDICATOR
Connector Type	TH04FW-NH



44	GR	
45	P	
46	R	
47	W	
48	L	
49	G	
50	L	
51	L	
54	W	
55	G	
56	BR	
57	P	
58	R	
60	Y	
61	GR	
62	SB	
64	G	
65	V	
66	P	
67	Y	
68	P	
69	BR	
71	Y	
72	L	
73	G	
74	L	
75	V	
76	R	
80	W	
81	L	
82	SB	
83	R	
84	BR	
85	R	
86	GR	
88	R	
89	W	
90	SHIELD	
91	Y	
92	BR	
93	W	
94	P	
95	V	
96	P	
97	G	
98	R	
99	LG	

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DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:000000007005733

DETAILED FLOW

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 "Question sheet". (Refer to [EVB-53, "Question sheet"](#).)

>> GO TO 2.

2. CHECK DTC

1. Check DTC.
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-303, "Symptom Table"](#).)
3. Check related service bulletins for information.

Are any symptoms described and any DTCs detected?

Symptom is described, DTC is detected>>GO TO 3.

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

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

3. CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer.

Also study the normal operation and fail-safe related to the symptom. Refer to [EVC-303, "Symptom Table"](#) and [EVB-29, "Fail-safe"](#).

Diagnosis Work Sheet is useful to verify the incident.

Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 5.

4. CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer.

Also study the normal operation and fail-safe related to the symptom. Refer to [EVC-303, "Symptom Table"](#) and [EVB-29, "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. 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 7.

NO >> Check according to [GI-51, "Intermittent Incident"](#).

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

6. DETECT MALFUNCTIONING SYSTEM BY SYMPTOM TABLE

Detect malfunctioning system according to [EVC-303. "Symptom Table"](#) 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 7.

NO >> Monitor input data from related sensors using CONSULT.

7. DETECT MALFUNCTIONING PART BY DIAGNOSIS PROCEDURE

Inspect according to Diagnosis Procedure of the system.

Is a malfunctioning part detected?

YES >> GO TO 8.

NO >> Monitor input data from related sensors using CONSULT.

8. 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 9.

9. 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 7.

YES-2 >> Symptom remains: GO TO 4.

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

Question sheet

INFOID:000000007005734

DESCRIPTION

By understanding those conditions properly, a quick and exact diagnosis can be achieved.

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

KEY POINTS

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

SEF907L

WORKSHEET SAMPLE

Question Sheet				
Customer name MR/MS	Incident Date		VIN	
	Model & Year		In Service Date	
	Trans.		Mileage	km/mile

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

Question Sheet	
Symptoms	<input type="checkbox"/> Does not to READY <input type="checkbox"/> EV system warning lamp is on <input type="checkbox"/> Power limitation indicator lamp is on
	<input type="checkbox"/> Water leak* <input type="checkbox"/> Noise* <input type="checkbox"/> Vibration* <input type="checkbox"/> Shock* <input type="checkbox"/> Gear noise*
	<input type="checkbox"/> Non driving* <input type="checkbox"/> Poor acceleration* <input type="checkbox"/> Poor torque* <input type="checkbox"/> Radio noise*
	<input type="checkbox"/> Does not charge <input type="checkbox"/> Other* *: If applied, enter in detail
	Detailed symptom
Onomatopoeia	
Frequency	<input type="checkbox"/> All the time <input type="checkbox"/> Once <input type="checkbox"/> Sometimes (times a day) <input type="checkbox"/> Other
Charging condition	<input type="checkbox"/> Full <input type="checkbox"/> Medium <input type="checkbox"/> Low
Weather conditions	<input type="checkbox"/> Not affected
	Weather <input type="checkbox"/> Fine <input type="checkbox"/> Clouding <input type="checkbox"/> Raining <input type="checkbox"/> Snowing <input type="checkbox"/> Other ()
	Temp. <input type="checkbox"/> Hot <input type="checkbox"/> Warm <input type="checkbox"/> Cool <input type="checkbox"/> Cold <input type="checkbox"/> Temp. [Approx. °C (°F)]
	Humidity <input type="checkbox"/> High <input type="checkbox"/> Middle <input type="checkbox"/> Low <input type="checkbox"/> Humidity (Approx. %)
Road conditions	<input type="checkbox"/> Not affected <input type="checkbox"/> In town <input type="checkbox"/> Freeway <input type="checkbox"/> Off road (Up / Down) <input type="checkbox"/> Deplorable road
	<input type="checkbox"/> Flat road <input type="checkbox"/> While turning (Right / Left) <input type="checkbox"/> Bump
	<input type="checkbox"/> Other
Shift position	<input type="checkbox"/> Not affected
	<input type="checkbox"/> P position <input type="checkbox"/> R position <input type="checkbox"/> N position <input type="checkbox"/> D position <input type="checkbox"/> ECO mode
Driving conditions	<input type="checkbox"/> Not affected
	<input type="checkbox"/> Power switch ON → OFF <input type="checkbox"/> Power switch OFF → ON <input type="checkbox"/> READY (stop the vehicle)
	<input type="checkbox"/> While cruising <input type="checkbox"/> While decelerating <input type="checkbox"/> Just before stopping <input type="checkbox"/> Just after stopping <input type="checkbox"/> D position (stop the vehicle)
	<input type="checkbox"/> While recharging <input type="checkbox"/> Other
	<input type="checkbox"/> Vehicle speed [km/h (MPH)] <input type="checkbox"/> Accelerator pedal (/ 8)
	<input type="checkbox"/> Battery level (Low / Middle / High)
Moments when malfunction disappears	<input type="checkbox"/> Disappears while driving <input type="checkbox"/> Disappears when stopped <input type="checkbox"/> Disappears with select operation
	<input type="checkbox"/> Disappears when power switch is pushed OFF <input type="checkbox"/> Disappears when battery charge is stopped <input type="checkbox"/> Does not disappear
	<input type="checkbox"/> Other
Other	

ADDITIONAL SERVICE WHEN REPLACING LI-ION BATTERY CONTROLLER

< BASIC INSPECTION >

ADDITIONAL SERVICE WHEN REPLACING LI-ION BATTERY CONTROLLER

Description

INFOID:000000007005735

When an Li-ion Battery Controller (LBC) or Li-ion battery (battery pack) is replaced, it is necessary to save the battery information stored in LBC to the new LBC.

Whenever any of the following work is performed, make sure to perform the above operation.

- Replace LBC
- Replace Li-ion battery (Battery pack: Module, LBC, Battery junction box)

Work Procedure

INFOID:000000007005736

1. SAVE THE LI-ION BATTERY CONTROLLER (LBC) INTERNAL INFORMATION

④ With CONSULT

1. Select "SAVE BATTERY INFORMATION DATA" in "WORK SUPPORT" mode.
2. Save the LBC internal information.

>> GO TO 2.

2. REPLACE LI-ION BATTERY OR LBC

Replace Li-ion battery or LBC. Refer to [EV-136, "Removal and Installation"](#) (Li-ion battery) or [EV-155, "LI-ION BATTERY CONTROLLER : Disassembly and Assembly"](#) (LBC).

>> GO TO 3.

3. WRITE THE LBC INTERNAL INFORMATION

④ With CONSULT

1. Select "WRITE BATTERY INFORMATION DATA" in "WORK SUPPORT" mode.
2. Write the information that has been read out before LBC replacement.

>> GO TO 4.

4. WRITE THE LBC INTERNAL INFORMATION TO VCM

Refer to "Li-ion Battery Registration Operation Manual."

>> END

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MODULE CHARGE BALANCE

< BASIC INSPECTION >

MODULE CHARGE BALANCE

Description

INFOID:000000007005737

If a malfunction such as abnormal voltage occurs with a cell of the Li-ion battery, replace the module containing the malfunctioning cell. When replacing the module, calculate the adjustment voltage value from the maximum cell voltage of other normal cells and adjust the replacement module to that adjustment voltage value.

Work Procedure

INFOID:000000007005738

1. CHECK ADJUSTMENT VOLTAGE VALUE

Ⓜ With CONSULT

1. Power switch ON.
2. Select "DATA MONITOR" mode.
3. Check "MAXIMUM CELL VOLTAGE".
4. Double the "MAXIMUM CELL VOLTAGE" and use that value as the module adjustment value.

Adjustment voltage value : MAXIMUM CELL VOLTAGE × 2

Example: 3.925 V (MAXIMUM CELL VOLTAGE) × 2 = 7.850 V (Adjustment voltage value)

>> GO TO 2.

2. CHECK MODULE VOLTAGE

CAUTION:

- This operation must be performed in an ambient temperature of 0 to 40°C.
- For details on the module charge balancer operation, refer to the adjuster operation manual.

1. Set the new module to the module charge balancer.
2. Measure module voltage and compare it with "adjustment voltage value" confirmed in STEP1.

Module voltage is lower than adjustment voltage value >> GO TO 4.

Module voltage is higher than adjustment voltage value >> GO TO 3.

3. DISCHARGE OF MODULE VOLTAGE

CAUTION:

- This operation must be performed in an ambient temperature of 0 to 40°C.
- For details on the module charge balancer operation, refer to the adjuster operation manual.

Discharge the module to 5.0 V using module charge balancer.

Discharge voltage : 5.0 V

>> GO TO 4.

4. MODULE VOLTAGE ADJUSTMENT

CAUTION:

- This operation must be performed in an ambient temperature of 0 to 40°C.
- For details on the module charge balancer operation, refer to the adjuster operation manual.

1. Enter the "adjustment voltage value" in the module charge balancer.

Adjustment voltage value : MAXIMUM CELL VOLTAGE × 2

2. Start the voltage adjustment.

>> After module voltage adjustment, GO TO 5.

5. CHECK MODULE VOLTAGE

1. Remove the module from the module charge balancer.
2. Using a circuit tester, check that the module voltage is within the specified range.

MODULE CHARGE BALANCE

< BASIC INSPECTION >

Standard : Adjustment voltage value ± 10 mV

A

>> GO TO 6.

6. CHECK CELL VOLTAGE

B

Ⓜ With CONSULT

1. After adjusting the voltage, install the module to the vehicle.
2. Select "DATA MONITOR" mode.
3. Check "CELL VOLTAGE" of install module.
4. Check that the difference from the "MAXIMUM CELL VOLTAGE" confirmed in Step1 is within the specified range.

EVB

D

Standard : MAXIMUM CELL VOLTAGE ± 33 mV

E

>> INSPECTION END

F

G

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J

K

L

M

N

O

P

P0A0D HV SYSTEM INTERLOCK ERROR

< DTC/CIRCUIT DIAGNOSIS >

DTC/CIRCUIT DIAGNOSIS

P0A0D HV SYSTEM INTERLOCK ERROR

DTC Logic

INFOID:000000007005739

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P0A0D	HV SYSTEM INTERLOCK ERROR	Self diagnosis program of Li-ion battery controller detects a malfunction in the CPU.	Li-ion battery controller

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

 With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is P0A1F detected?

- YES >> Refer to [EVB-58, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005740

WARNING:

- Because 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.
- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.
- Be sure to wear insulating protective gear consisting of glove, shoes and glasses/face shield before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.
- Refer to [EVB-5, "High Voltage Precautions"](#).

CAUTION:

There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.

1. PRECONDITIONING

WARNING:

Shut off high voltage circuit. Refer to [GI-31, "How to Cut Off High Voltage"](#).

1. Remove Li-ion battery. Refer to [EVB-136, "Removal and Installation"](#).
2. Remove battery pack upper case. Refer to [EVB-149, "BATTERY JUNCTION BOX : Disassembly and Assembly"](#), see Step-1 to Step-3.

>> GO TO 2.

2. CHECK LI-ION BATTERY INTERLOCK DETECTIONING CIRCUIT FOR SHORT-1

1. Disconnect Li-ion battery controller (LBC) harness connector.
2. Disconnect interlock detecting switch (high voltage harness connector) harness connector.
3. Check the continuity between Li-ion battery controller harness connector and ground.

P0A0D HV SYSTEM INTERLOCK ERROR

< DTC/CIRCUIT DIAGNOSIS >

LBC		—	Continuity
Connector	Terminal		
LB9	8	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace Li-ion battery vehicle communication harness.

3. CHECK LI-ION BATTERY INTERLOCK DETECTIONING CIRCUIT FOR SHORT-2

1. Disconnect interlock detecting switch (service plug) harness connector.
2. Check the continuity between Li-ion battery controller harness connector and ground.

LBC		—	Continuity
Connector	Terminal		
LB9	21	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace Li-ion battery vehicle communication harness.

4. CHECK LI-ION BATTERY INTERLOCK DETECTIONING CIRCUIT FOR SHORT-3

Check the continuity between interlock detecting switch (service plug) harness connector and ground.

Interlock detecting switch (Service plug)		—	Continuity
Connector	Terminal		
LB6	4	Ground	Not existed

Is the inspection result normal?

YES >> Replace Li-ion battery controller.

NO >> Replace Li-ion battery vehicle communication harness.

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P0A1F BATTERY ENERGY CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

P0A1F BATTERY ENERGY CONTROL MODULE

DTC Logic

INFOID:000000007005741

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P0A1F	BATTERY ENERGY CONTROL MODULE	Self diagnosis program of Li-ion battery controller detects a malfunction in the CPU.	Li-ion battery controller

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

④ With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is P0A1F detected?

- YES >> Refer to [EVB-60, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005742

When this DTC is detected, replace Li-ion battery controller. Refer to [EVB-155, "LI-ION BATTERY CONTROLLER : Disassembly and Assembly"](#).

P3030 CELL CONTROLLER LIN

< DTC/CIRCUIT DIAGNOSIS >

P3030 CELL CONTROLLER LIN

DTC Logic

INFOID:000000007005743

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P3030	CELL CONT LIN	A malfunction occurs with the communication function in Li-ion battery controller.	<ul style="list-style-type: none">• Li-ion battery controller• Module• Harness or connector

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

④ With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is P3030 detected?

- YES >> Refer to [EVB-61, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005744

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

④ With CONSULT

1. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
2. Confirm self diagnosis result if "P30F3" is detected.

Is P30F3 detected?

- YES >> Replace Li-ion battery. Refer to [EVB-136, "Removal and Installation"](#).
NO >> Replace Li-ion battery controller. Refer to [EVB-155, "LI-ION BATTERY CONTROLLER : Disassembly and Assembly"](#).

P3031-P303C CELL CONTROLLER ASIC

< DTC/CIRCUIT DIAGNOSIS >

P3031-P303C CELL CONTROLLER ASIC

DTC Logic

INFOID:000000007005745

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P3031	CELL CONT ASIC1	A malfunction occurs with the communication function in Li-ion battery controller.	Li-ion battery controller
P3032	CELL CONT ASIC2		
P3033	CELL CONT ASIC3		
P3034	CELL CONT ASIC4		
P3035	CELL CONT ASIC5		
P3036	CELL CONT ASIC6		
P3037	CELL CONT ASIC7		
P3038	CELL CONT ASIC8		
P3039	CELL CONT ASIC9		
P303A	CELL CONT ASIC10		
P303B	CELL CONT ASIC11		
P303C	CELL CONT ASIC12		

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

④ With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is any DTC detected?

- YES >> Refer to [EVB-62, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005746

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

④ With CONSULT

1. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
2. Confirm self diagnostic result if "P3030" is detected.

Is P3030 detected?

- YES >> Perform diagnosis on the detected P3030. Refer to [EVB-61, "Diagnosis Procedure"](#).
NO >> Replace Li-ion battery controller. Refer to [EVB-155, "LI-ION BATTERY CONTROLLER : Disassembly and Assembly"](#).

P303D-P3048 CELL CONTROLLER ASIC

< DTC/CIRCUIT DIAGNOSIS >

P303D-P3048 CELL CONTROLLER ASIC

DTC Logic

INFOID:000000007005747

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P3031	CELL CONT ASIC1	A malfunction occurs with the communication function in Li-ion battery controller.	Li-ion battery controller
P3032	CELL CONT ASIC2		
P3033	CELL CONT ASIC3		
P3034	CELL CONT ASIC4		
P3035	CELL CONT ASIC5		
P3036	CELL CONT ASIC6		
P3037	CELL CONT ASIC7		
P3038	CELL CONT ASIC8		
P3039	CELL CONT ASIC9		
P303A	CELL CONT ASIC10		
P303B	CELL CONT ASIC11		
P303C	CELL CONT ASIC12		

EVB

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

④ With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is any DTC detected?

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

Diagnosis Procedure

INFOID:000000007005748

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

④ With CONSULT

1. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
2. Confirm self diagnostic result if "P3030" is detected.

Is P3030 detected?

- YES >> Perform diagnosis on the detected P3030. Refer to [EVB-61, "Diagnosis Procedure"](#).
NO >> Replace Li-ion battery controller. Refer to [EVB-155, "LI-ION BATTERY CONTROLLER : Disassembly and Assembly"](#).

P3049-P3054 CELL CONTROLLER ASIC VOLTAGE

< DTC/CIRCUIT DIAGNOSIS >

P3049-P3054 CELL CONTROLLER ASIC VOLTAGE

DTC Logic

INFOID:000000007005749

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P3049	CELL CONT ASIC1 VOLT	The AD converter in Li-ion battery controller is malfunctioning.	<ul style="list-style-type: none">• Li-ion battery controller• Module• Harness or connector
P304A	CELL CONT ASIC2 VOLT		
P304B	CELL CONT ASIC3 VOLT		
P304C	CELL CONT ASIC4 VOLT		
P304D	CELL CONT ASIC5 VOLT		
P304E	CELL CONT ASIC6 VOLT		
P304F	CELL CONT ASIC7 VOLT		
P3050	CELL CONT ASIC8 VOLT		
P3051	CELL CONT ASIC9 VOLT		
P3052	CELL CONT ASIC10 VOLT		
P3053	CELL CONT ASIC11 VOLT		
P3054	CELL CONT ASIC12 VOLT		

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

④ With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is any DTC detected?

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

Diagnosis Procedure

INFOID:000000007005750

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

④ With CONSULT

1. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
2. Check DTC.

Is any DTC detected?

P3302-P3331 is detected in addition to P3049-P3054>>Perform diagnosis on the detected P3302-P3331. Refer to [EVB-91, "Diagnosis Procedure"](#) (P3302-P330D), [EVB-94, "Diagnosis Procedure"](#) (P330E-P3319), [EVB-97, "Diagnosis Procedure"](#) (P331A-P3325) or [EVB-100, "Diagnosis Procedure"](#) (P3326-P3331).

P3375-P33A4 is detected in addition to P3049-P3054>>Perform diagnosis on the detected P3375-P33A4. Refer to [EVB-104, "Diagnosis Procedure"](#) (P3375-P3380), [EVB-107, "Diagnosis Procedure"](#) (P3381-P338C), [EVB-110, "Diagnosis Procedure"](#) (P338D-P3398), or [EVB-113, "Diagnosis Procedure"](#) (P3399-P33A4).

Just P3049-P3054 is detected>>Replace Li-ion battery controller. Refer to [EVB-155, "LI-ION BATTERY CONTROLLER : Disassembly and Assembly"](#).

P3055-P3060 CELL CONTROLLER ASIC VOLTAGE

< DTC/CIRCUIT DIAGNOSIS >

P3055-P3060 CELL CONTROLLER ASIC VOLTAGE

DTC Logic

INFOID:000000007005751

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P3049	CELL CONT ASIC1 VOLT	The AD converter in Li-ion battery controller is malfunctioning.	<ul style="list-style-type: none">• Li-ion battery controller• Module• Harness or connector
P304A	CELL CONT ASIC2 VOLT		
P304B	CELL CONT ASIC3 VOLT		
P304C	CELL CONT ASIC4 VOLT		
P304D	CELL CONT ASIC5 VOLT		
P304E	CELL CONT ASIC6 VOLT		
P304F	CELL CONT ASIC7 VOLT		
P3050	CELL CONT ASIC8 VOLT		
P3051	CELL CONT ASIC9 VOLT		
P3052	CELL CONT ASIC10 VOLT		
P3053	CELL CONT ASIC11 VOLT		
P3054	CELL CONT ASIC12 VOLT		

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

④ With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is any DTC detected?

- YES >> Refer to [EVB-65, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005752

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

④ With CONSULT

1. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
2. Check DTC.

Is any DTC detected?

- P3302-P3331 is detected in addition to P3049-P3054>>Perform diagnosis on the detected P3302-P3331. Refer to [EVB-91, "Diagnosis Procedure"](#) (P3302-P330D), [EVB-94, "Diagnosis Procedure"](#) (P330E-P3319), [EVB-97, "Diagnosis Procedure"](#) (P331A-P3325) or [EVB-100, "Diagnosis Procedure"](#) (P3326-P3331).
- P3375-P33A4 is detected in addition to P3049-P3054>>Perform diagnosis on the detected P3375-P33A4. Refer to [EVB-104, "Diagnosis Procedure"](#) (P3375-P3380), [EVB-107, "Diagnosis Procedure"](#) (P3381-P338C), [EVB-110, "Diagnosis Procedure"](#) (P338D-P3398), or [EVB-113, "Diagnosis Procedure"](#) (P3399-P33A4).
- Just P3049-P3054 is detected>>Replace Li-ion battery controller. Refer to [EVB-155, "LI-ION BATTERY CONTROLLER : Disassembly and Assembly"](#).

P3061 CELL BATTERY VOLTAGE

< DTC/CIRCUIT DIAGNOSIS >

P3061 CELL BATTERY VOLTAGE

DTC Logic

INFOID:000000007005753

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P3061	CELL BATTERY VOLT	An open circuit diagnosis detection circuit in Li-ion battery controller is malfunctioning.	Li-ion battery controller

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

④ With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is P3061 detected?

- YES >> Refer to [EVB-66, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005754

When this DTC is detected, replace Li-ion battery controller. Refer to [EVB-155, "LI-ION BATTERY CONTROLLER : Disassembly and Assembly"](#).

P3062 BYPASS SWITCH

< DTC/CIRCUIT DIAGNOSIS >

P3062 BYPASS SWITCH

DTC Logic

INFOID:000000007005755

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P3062	BYPASS SW	A malfunction of the bypass switch in Li-ion battery controller is detected.	<ul style="list-style-type: none">• Li-ion battery controller• Module• Harness or connector

DTC DETECTION LOGIC

1. PERFORM DTC CONFIRMATION PROCEDURE

④ With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is P3062 detected?

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

Diagnosis Procedure

INFOID:000000007005756

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

④ With CONSULT

1. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
2. Confirm "Self Diagnostic Result" if "P3375"- "P33A4" is detected.

Is P3375-P33A4 detected?

- YES >> Perform diagnosis on the detected "P3375"- "P33A4". Refer to [EVB-104, "Diagnosis Procedure"](#).
NO >> Replace Li-ion battery controller. Refer to [EVB-155, "LI-ION BATTERY CONTROLLER : Disassembly and Assembly"](#).

P308B-P3096 CELL CONTROLLER ASIC OPEN

< DTC/CIRCUIT DIAGNOSIS >

P308B-P3096 CELL CONTROLLER ASIC OPEN

DTC Logic

INFOID:000000007005757

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P308B	CELL CONT ASIC1 OPEN	Self diagnosis program of Li-ion battery controller detects an open circuit in the cell voltage detection line.	<ul style="list-style-type: none"> • Li-ion battery controller • Harness or connector
P308C	CELL CONT ASIC2 OPEN		
P308D	CELL CONT ASIC3 OPEN		
P308E	CELL CONT ASIC4 OPEN		
P308F	CELL CONT ASIC5 OPEN		
P3090	CELL CONT ASIC6 OPEN		
P3091	CELL CONT ASIC7 OPEN		
P3092	CELL CONT ASIC8 OPEN		
P3093	CELL CONT ASIC9 OPEN		
P3094	CELL CONT ASIC10 OPEN		
P3095	CELL CONT ASIC11 OPEN		
P3096	CELL CONT ASIC12 OPEN		

DTC DETECTION LOGIC

1. PERFORM DTC CONFIRMATION PROCEDURE

Ⓟ With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is P308B-P30A2 detected?

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

Diagnosis Procedure

INFOID:000000007005758

WARNING:

- Because 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.
- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.
- Be sure to wear insulating protective equipments consisting of glove, shoes and glasses/face shield before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.
- Refer to [EVB-5, "High Voltage Precautions"](#).

CAUTION:

There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.

1. PERFORM THE SELF-DIAGNOSIS

Ⓟ With CONSULT

1. Perform "All DTC Reading" with CONSULT.

P308B-P3096 CELL CONTROLLER ASIC OPEN

< DTC/CIRCUIT DIAGNOSIS >

2. Confirm self diagnostic result of "HV BAT" if either "P3049"- "P3060" (CELL CONT ASIC VOLT related codes) or "P3375"- "P33A4" (CELL OVER DISCHARGE related codes) is detected.
3. Check DTC.

Is P3049-P3060 or P3375-P33A4 detected?

P3049-P3060 is detected>>Perform diagnosis on the detected P3049-P3060. Refer to [EVB-64, "Diagnosis Procedure"](#) (P3049-P3054), or [EVB-65, "Diagnosis Procedure"](#) (P3055-P3060).

P3375-P33A4 is detected>>Perform diagnosis on the detected P3375-P33A4. Refer to [EVB-104, "Diagnosis Procedure"](#) (P3375-P3380), [EVB-107, "Diagnosis Procedure"](#) (P3381-P338C), [EVB-110, "Diagnosis Procedure"](#) (P338D-P3398), or [EVB-113, "Diagnosis Procedure"](#) (P3399-P33A4).

NO >> GO TO 2.

2. PRECONDITIONING

WARNING:

Shut off high voltage circuit. Refer to [GI-31, "How to Cut Off High Voltage"](#).

1. Remove Li-ion battery. Refer to [EVB-136, "Removal and Installation"](#).
2. Remove battery pack upper case. Refer to [EVB-149, "BATTERY JUNCTION BOX : Disassembly and Assembly"](#), see Step-1 to Step-3.

>> GO TO 3.

3. CHECK CONNECTION STATUS

1. Power switch OFF.
2. Check connection status of Li-ion battery controller harness connector and module harness connector.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Recover the connection status.

4. CHECK HARNESS BETWEEN LI-ION BATTERY CONTROLLER AND MODULE

1. Disconnect Li-ion battery controller harness connector and Module harness connector.
2. Refer to below table and continuity between Li-ion battery controller and Module, according to detected DTC.

DTC	Module No.	Module		Li-ion battery controller		Continuity
		Connector	Terminal	Connector	Terminal	
P308B	1	LB9	2	LB13	50	Existed
	2		3		51	
P308C	3	LB9	4	LB13	52	Existed
	4		5		53	
P308D	5	LB9	6	LB13	54	Existed
	6		7		55	
P308E	7	LB9	8	LB13	56	Existed
	8		9		57	
P308F	9	LB9	26	LB13	58	Existed
	10		27		59	
P3090	11	LB9	28	LB13	60	Existed
	12		29		61	
P3091	13	LB9	30	LB13	62	Existed
	14		31		63	
P3092	15	LB10	45	LB14	77	Existed
	16		46		78	
P3093	17	LB10	36	LB14	80	Existed
	18		37		81	

P308B-P3096 CELL CONTROLLER ASIC OPEN

< DTC/CIRCUIT DIAGNOSIS >

DTC	Module No.	Module		Li-ion battery controller		Continuity
		Connector	Terminal	Connector	Terminal	
P3094	19	LB10	38	LB14	82	Existed
	20		39		83	
P3095	21	LB10	52	LB14	84	Existed
	22		53		85	
P3096	23	LB10	54	LB14	86	Existed
	24		55		87	

Is the inspection result normal?

- YES >> Replace Li-ion battery controller. Refer to [EVB-155, "LI-ION BATTERY CONTROLLER : Disassembly and Assembly"](#).
- NO >> Repair harness or connector.

P3097-P30A2 CELL CONTROLLER ASIC OPEN

< DTC/CIRCUIT DIAGNOSIS >

P3097-P30A2 CELL CONTROLLER ASIC OPEN

DTC Logic

INFOID:000000007005759

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P308B	CELL CONT ASIC1 OPEN	Self diagnosis program of Li-ion battery controller detects an open circuit in the cell voltage detection line.	<ul style="list-style-type: none"> Li-ion battery controller Harness or connector
P308C	CELL CONT ASIC2 OPEN		
P308D	CELL CONT ASIC3 OPEN		
P308E	CELL CONT ASIC4 OPEN		
P308F	CELL CONT ASIC5 OPEN		
P3090	CELL CONT ASIC6 OPEN		
P3091	CELL CONT ASIC7 OPEN		
P3092	CELL CONT ASIC8 OPEN		
P3093	CELL CONT ASIC9 OPEN		
P3094	CELL CONT ASIC10 OPEN		
P3095	CELL CONT ASIC11 OPEN		
P3096	CELL CONT ASIC12 OPEN		

DTC DETECTION LOGIC

1. PERFORM DTC CONFIRMATION PROCEDURE

Ⓜ With CONSULT

- Power switch ON and wait for 10 seconds or more.
- Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
- Check DTC.

Is P308B-P30A2 detected?

- YES >> Refer to [EV B-71, "Diagnosis Procedure"](#).
 NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005760

WARNING:

- Because 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.
- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.
- Be sure to wear insulating protective equipments consisting of glove, shoes and glasses/face shield before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.
- Refer to [EV B-5, "High Voltage Precautions"](#).

CAUTION:

There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.

1. PERFORM THE SELF-DIAGNOSIS

Ⓜ With CONSULT

- Perform "All DTC Reading" with CONSULT.

P3097-P30A2 CELL CONTROLLER ASIC OPEN

< DTC/CIRCUIT DIAGNOSIS >

2. Confirm self diagnostic result of "HV BAT" if either "P3049"- "P3060" (CELL CONT ASIC VOLT related codes) or "P3375"- "P33A4" (CELL OVER DISCHARGE related codes) is detected.
3. Check DTC.

Is P3049-P3060 or P3375-P33A4 detected?

P3049-P3060 is detected>>Perform diagnosis on the detected P3049-P3060. Refer to [EVB-64, "Diagnosis Procedure"](#) (P3049-P3054), or [EVB-65, "Diagnosis Procedure"](#) (P3055-P3060).

P3375-P33A4 is detected>>Perform diagnosis on the detected P3375-P33A4. Refer to [EVB-104, "Diagnosis Procedure"](#) (P3375-P3380), [EVB-107, "Diagnosis Procedure"](#) (P3381-P338C), [EVB-110, "Diagnosis Procedure"](#) (P338D-P3398), or [EVB-113, "Diagnosis Procedure"](#) (P3399-P33A4).

NO >> GO TO 2.

2. PRECONDITIONING

WARNING:

Shut off high voltage circuit. Refer to [GI-31, "How to Cut Off High Voltage"](#).

1. Remove Li-ion battery. Refer to [EVB-136, "Removal and Installation"](#).
2. Remove battery pack upper case. Refer to [EVB-149, "BATTERY JUNCTION BOX : Disassembly and Assembly"](#), see Step-1 to Step-3.

>> GO TO 3.

3. CHECK CONNECTION STATUS

1. Power switch OFF.
2. Check connection status of Li-ion battery controller harness connector and module harness connector.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Recover the connection status.

4. CHECK HARNESS BETWEEN LI-ION BATTERY CONTROLLER AND MODULE

1. Disconnect Li-ion battery controller harness connector and Module harness connector.
2. Refer to below table and continuity between Li-ion battery controller and Module, according to detected DTC.

DTC	Module No.	Module		Li-ion battery controller		Continuity
		Connector	Terminal	Connector	Terminal	
P308B	1	LB9	2	LB13	50	Existed
	2		3		51	
P308C	3	LB9	4	LB13	52	Existed
	4		5		53	
P308D	5	LB9	6	LB13	54	Existed
	6		7		55	
P308E	7	LB9	8	LB13	56	Existed
	8		9		57	
P308F	9	LB9	26	LB13	58	Existed
	10		27		59	
P3090	11	LB9	28	LB13	60	Existed
	12		29		61	
P3091	13	LB9	30	LB13	62	Existed
	14		31		63	
P3092	15	LB10	45	LB14	77	Existed
	16		46		78	
P3093	17	LB10	36	LB14	80	Existed
	18		37		81	

P3097-P30A2 CELL CONTROLLER ASIC OPEN

< DTC/CIRCUIT DIAGNOSIS >

DTC	Module No.	Module		Li-ion battery controller		Continuity
		Connector	Terminal	Connector	Terminal	
P3094	19	LB10	38	LB14	82	Existed
	20		39		83	
P3095	21	LB10	52	LB14	84	Existed
	22		53		85	
P3096	23	LB10	54	LB14	86	Existed
	24		55		87	

Is the inspection result normal?

- YES >> Replace Li-ion battery controller. Refer to [EVB-155, "LI-ION BATTERY CONTROLLER : Disassembly and Assembly"](#).
- NO >> Repair harness or connector.

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P30F3 TOTAL VOLTAGE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P30F3 TOTAL VOLTAGE SENSOR

DTC Logic

INFOID:000000007005761

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P30F3	TOTAL VOLT SENSOR	A malfunction occurs with the communication function in Li-ion battery controller.	<ul style="list-style-type: none">• Li-ion battery controller• Module• Harness or connector

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

④ With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is P30F3 detected?

- YES >> Refer to [EVB-74, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005762

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

④ With CONSULT

1. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
2. Check DTC.

Is DTC detected?

- YES >> Perform diagnosis on the detected P3030. Refer to [EVB-61, "Diagnosis Procedure"](#).
NO >> Replace Li-ion battery controller. Refer to [EVB-155, "LI-ION BATTERY CONTROLLER : Disassembly and Assembly"](#).

P30F4 TOTAL VOLTAGE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P30F4 TOTAL VOLTAGE SENSOR

DTC Logic

INFOID:000000007005763

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P30F4	TOTAL VOLT SENSOR	When the voltage recognized by total voltage sensor in Li-ion battery controller is excessively high or low.	<ul style="list-style-type: none">• Li-ion battery controller• Bus bar between stack• Service plug (fuse)• Module

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

④ With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is P30F4 detected?

- YES >> Refer to [EV B-75, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005764

WARNING:

- Because 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.
- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.
- Be sure to wear insulating protective gear consisting of glove, shoes and glasses/face shield before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.
- Refer to [EV B-5, "High Voltage Precautions"](#).

CAUTION:

There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.

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

④ With CONSULT

1. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
2. Check if any DTC is detected in "Self Diagnostic Result".

Is any DTC detected?

- P3030 is detected in addition to P30F4 (Cannot be monitored)>>GO TO 3.
Just P30F4 is detected>>GO TO 2.

2. CHECK FUSE

1. Power switch OFF.
2. Check fuse of service plug.

Is the inspection result normal?

- YES >> Replace Li-ion battery controller.
NO >> Replace service plug.

P30F4 TOTAL VOLTAGE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

3. PRECONDITIONING

WARNING:

Shut off high voltage circuit. Refer to [GI-31, "How to Cut Off High Voltage"](#).

1. Remove Li-ion battery. Refer to [EVB-136, "Removal and Installation"](#).
2. Remove battery pack upper case. Refer to [EVB-149, "BATTERY JUNCTION BOX : Disassembly and Assembly"](#), see Step-1 to Step-3.

>> GO TO 4.

4. CHECK CONNECTION STATUS STACK AND BUS BAR.

Check connection status between each stack and connection status of each bus bar.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Recover the connection status.

5. CHECK MODULE VOLTAGE

Check the voltage of all modules.

Is the inspection result normal?

YES >> Replace Li-ion battery controller. Refer to [EVB-155, "LI-ION BATTERY CONTROLLER : Disassembly and Assembly"](#).

NO >> Replace the corresponding module. Refer to [EVB-143, "Exploded view"](#).

Component Inspection

INFOID:000000007005765

1. CHECK MODULE VOLTAGE

Check voltage of module.

A : + terminal (Red)

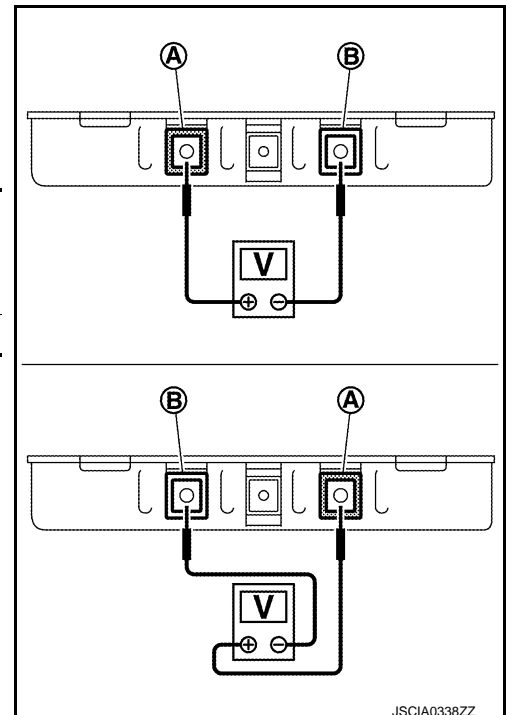
B : - terminal (Black)

Terminals		Voltage (Approx.)
(+)	(-)	
Module		5.0 - 8.5 V
+ terminal (Red)	- terminal (Black)	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace module. Refer to [EVB-143, "Exploded view"](#).



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P30F5 TOTAL VOLTAGE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P30F5 TOTAL VOLTAGE SENSOR

DTC Logic

INFOID:000000007005766

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P30F5	TOTAL VOLT SENSOR	When the voltage recognized by total voltage sensor in Li-ion battery controller is excessively high or low.	<ul style="list-style-type: none">• Li-ion battery controller• Bus bar between stack• Service plug (fuse)• Module

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

④ With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is P30F5 detected?

- YES >> Refer to [EVB-77, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005767

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

④ With CONSULT

1. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
2. Check if P30F4 is detected in "Self Diagnostic Result".

Is any P30F4 detected?

- YES >> Perform diagnosis on the detected P30F4. Refer to [EVB-75, "Diagnosis Procedure"](#).
NO >> Replace Li-ion battery controller. Refer to [EVB-155, "LI-ION BATTERY CONTROLLER : Disassembly and Assembly"](#).

P30FC OVER CURRENT

< DTC/CIRCUIT DIAGNOSIS >

P30FC OVER CURRENT

DTC Logic

INFOID:000000007005768

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P30FC	OVER CURRENT	When the temperature of the entire battery pack estimated from the current value is excessively high.	<ul style="list-style-type: none">Battery current sensorOther systems malfunction

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

④ With CONSULT

- Power switch ON and wait for 10 seconds or more.
- Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
- Check DTC.

Is P30FC detected?

- YES >> Refer to [EVB-78, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005769

1. PERFORM THE SELF-DIAGNOSIS

④ With CONSULT

- Perform "All DTC Reading" with CONSULT.
- Check "Self diagnostic result" of systems other than "HV BAT" if any DTC is detected.

Is any DTC detected?

- YES >> After performing trouble diagnosis of detected DTC, GO TO 2.
NO >> GO TO 2.

2. CHECK BATTERY TEMPERATURE SENSOR

④ With CONSULT

Using FFD, check the values of four temperature sensors when DTC is detected.

Monitor item	Condition	Limit
Battery temperature sensor 1	Power switch ON	55°C (131°F) or less
Battery temperature sensor 2		
Battery temperature sensor 3		
Battery temperature sensor 4		

Is there temperature increase?

- Temperature increase is seen>>Replace Li-ion battery. Refer to [EVB-136, "Removal and Installation"](#).
Temperature increase is not seen>>Replace battery junction box. Refer to [EVB-136, "Removal and Installation"](#).

P30FD TOTAL VOLTAGE MONITOR SWITCH

< DTC/CIRCUIT DIAGNOSIS >

P30FD TOTAL VOLTAGE MONITOR SWITCH

DTC Logic

INFOID:000000007005770

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P30FD	TOTAL VOLTAGE MONITOR SWITCH	<ul style="list-style-type: none">Total voltage detection switch in Li-ion battery controller is malfunctioning.Self diagnosis malfunction of total voltage detection circuit stop function in Li-ion battery controller.	<ul style="list-style-type: none">Li-ion battery controller

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

Ⓜ With CONSULT

- Power switch ON and wait for 10 seconds or more.
- Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
- Check DTC.

Is P30FC detected?

- YES >> Refer to [EVB-79, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005771

When this DTC is detected, replace Li-ion battery controller. Refer to [EVB-155, "LI-ION BATTERY CONTROLLER : Disassembly and Assembly"](#).

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P30FE 12V BATTERY VOLTAGE

< DTC/CIRCUIT DIAGNOSIS >

P30FE 12V BATTERY VOLTAGE

DTC Logic

INFOID:000000007005772

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P30FE	12V BATTERY VOLTAGE	12V battery voltage lowers to less than 9 V.	<ul style="list-style-type: none">• 12V battery• Harness

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

④ With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is P30FE detected?

- YES >> Refer to [EVB-80, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005773

WARNING:

- Because 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.
- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.
- Be sure to wear insulating protective gear consisting of glove, shoes and glasses/face shield before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.
- Refer to [EVB-5, "High Voltage Precautions"](#).

CAUTION:

There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.

1. CHECK VOLTAGE OF 12V BATTERY

Check the voltage of 12V battery using circuit tester.

Is output more than 9V?

- YES >> GO TO 2.
NO >> Replace 12V battery. Refer to [PG-104, "Removal and Installation"](#).

2. CHECK FUSE

1. Power switch OFF.
2. Check 20A fuse [No.43].

NOTE:

Refer to [PG-83, "Fuse, Connector and Terminal Arrangement"](#) for fuse layout.

Is the inspection result normal?

- YES >> GO TO 3.
NO >> After eliminating the cause of flame cutting, replace the fuse.

3. CHECK LI-ION BATTERY POWER SUPPLY

P30FE 12V BATTERY VOLTAGE

< DTC/CIRCUIT DIAGNOSIS >

1. Disconnect Li-ion battery vehicle communication harness connector.
2. Check voltage between Li-ion battery harness connector and ground.

+		-	Voltage
Li-ion battery			
Connector	Terminal		
B24	5	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.

4. PRECONDITIONING

WARNING:

Shut off high voltage circuit. Refer to [GI-31, "How to Cut Off High Voltage"](#).

1. Remove Li-ion battery. Refer to [EVB-136, "Removal and Installation"](#).
2. Remove battery pack upper case. Refer to [EVB-149, "BATTERY JUNCTION BOX : Disassembly and Assembly"](#), see Step-1 to Step-3.

>> GO TO 5.

5. CHECK HARNESS BETWEEN LI-ION BATTERY AND LI-ION BATTERY CONTROLLER

1. Disconnect Li-ion battery harness connector and Li-ion battery controller harness connector.
2. Check continuity between Li-ion battery harness connector and Li-ion battery controller harness connector.

Li-ion battery		Li-ion battery controller		Continuity
Connector	Terminal	Connector	Terminal	
LB1	5	LB11	12	Existed

Is the inspection result normal?

YES >> Replace Li-ion battery controller. Refer to [EVB-155, "LI-ION BATTERY CONTROLLER : Disassembly and Assembly"](#).

NO >> Repair harness or connector.

P318D COMMUNICATION ERROR

< DTC/CIRCUIT DIAGNOSIS >

P318D COMMUNICATION ERROR

DTC Logic

INFOID:000000007005774

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P318D	COMMUNICATION ERROR	When no CAN communication signal is received continuously.	<ul style="list-style-type: none">• CAN communication line• Li-ion battery controller• VCM

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

④ With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is P318D detected?

- YES >> Refer to [EVB-82, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005775

For the diagnosis procedure, refer to [LAN-15, "Trouble Diagnosis Flow Chart"](#).

P318E COMMUNICATION ERROR

< DTC/CIRCUIT DIAGNOSIS >

P318E COMMUNICATION ERROR

DTC Logic

INFOID:000000007005776

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P318E	COMMUNICATION ERROR	When no CAN communication signal is received from VCM continuously.	<ul style="list-style-type: none">• VCM• Li-ion battery controller• CAN communication line

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

 With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is P318E detected?

- YES >> Refer to [EVB-83, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005777

When this DTC is detected, replace VCM. Refer to [EVC-315, "Exploded View"](#).

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P3191 COMMUNICATION ERROR

< DTC/CIRCUIT DIAGNOSIS >

P3191 COMMUNICATION ERROR

DTC Logic

INFOID:000000007005778

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P3191	COMMUNICATION ERROR	When no CAN communication signal is received from traction motor inverter continuously.	<ul style="list-style-type: none">• Traction motor inverter• Li-ion battery controller• CAN communication line

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

④ With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is P3191 detected?

- YES >> Refer to [EVB-84, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005779

When this DTC is detected, replace traction motor inverter. Refer to [TMS-115, "Exploded View"](#).

P3196 COMMUNICATION ERROR

< DTC/CIRCUIT DIAGNOSIS >

P3196 COMMUNICATION ERROR

DTC Logic

INFOID:000000007005780

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P3196	COMMUNICATION ERROR	When no CAN communication signal is received from on-board charger continuously.	<ul style="list-style-type: none">• On board charger• Li-ion battery controller• CAN communication line

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

④ With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is P3196 detected?

- YES >> Refer to [EVB-85, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005781

When this DTC is detected, replace on board charger. Refer to [VC-98, "Exploded View"](#).

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P3199 COMMUNICATION ERROR

< DTC/CIRCUIT DIAGNOSIS >

P3199 COMMUNICATION ERROR

DTC Logic

INFOID:000000007005782

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P3199	COMMUNICATION ERROR	When a CRC error from VCM is detected.	<ul style="list-style-type: none">• VCM• Li-ion battery controller

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

④ With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is P3199 detected?

- YES >> Refer to [EVB-86, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005783

When this DTC is detected, replace VCM. Refer to [EVC-315, "Exploded View"](#).

P319C COMMUNICATION ERROR

< DTC/CIRCUIT DIAGNOSIS >

P319C COMMUNICATION ERROR

DTC Logic

INFOID:000000007005784

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P319C	COMMUNICATION ERROR	When a CRC error from traction motor inverter is detected.	<ul style="list-style-type: none">• Traction motor inverter• Li-ion battery controller

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

④ With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is P319C detected?

- YES >> Refer to [EV8-87, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005785

When this DTC is detected, replace traction motor inverter. Refer to [TMS-115, "Exploded View"](#).

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P31A4 CAN ERROR VCM

< DTC/CIRCUIT DIAGNOSIS >

P31A4 CAN ERROR VCM

DTC Logic

INFOID:000000007005786

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P31A4	CAN ERROR VCM	If the CAN data from VCM has not change from the value which was previously received.	VCM

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

④ With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is P31A4 detected?

- YES >> Refer to [EVB-88, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005787

When this DTC is detected, replace VCM. Refer to [EVC-315, "Exploded View"](#).

P31A7 CAN ERROR INV/MC

< DTC/CIRCUIT DIAGNOSIS >

P31A7 CAN ERROR INV/MC

DTC Logic

INFOID:000000007005788

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P31A7	CAN ERROR INV/MC	If the CAN data from traction motor inverter has not change from the value which was previously received.	Traction motor inverter

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

④ With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is P31A7 detected?

- YES >> Refer to [EVB-89, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005789

When this DTC is detected, replace traction motor inverter. Refer to [TMS-115, "Exploded View"](#).

P3300 TOTAL VOLTAGE OVER

< DTC/CIRCUIT DIAGNOSIS >

P3300 TOTAL VOLTAGE OVER

DTC Logic

INFOID:000000007005790

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P3300	TOTAL VOLTAGE OVER	When total voltage exceeds the allowable working voltage range.	<ul style="list-style-type: none">• Li-ion battery• Li-ion battery controller• VCM• Traction motor inverter

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

Ⓟ With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is P3300 detected?

- YES >> Refer to [EVB-90, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005791

1. PERFORM THE SELF-DIAGNOSIS

Ⓟ With CONSULT

1. Perform "All DTC Reading" with CONSULT.
2. Check "Self Diagnostic Result" of systems other than "HV BAT" if any DTC is detected.

Is any DTC detected?

- YES >> After performing trouble diagnosis of detected DTC, GO TO 2.
NO >> GO TO 2.

2. PERFORM THE SELF-DIAGNOSIS OF LI-ION BATTERY CONTROLLER

Ⓟ With CONSULT

1. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
2. Confirm "Self Diagnostic Result" if "P3302"- "P3331" is detected.

Is P3302-P3331 detected?

- YES >> Perform diagnosis on the detected "P3302"- "P3331". Refer to [EVB-91, "Diagnosis Procedure"](#).
NO >> Replace Li-ion battery controller. Refer to [EVB-155, "LI-ION BATTERY CONTROLLER : Disassembly and Assembly"](#).

P3302-P330D CELL OVER VOLTAGE

< DTC/CIRCUIT DIAGNOSIS >

P3302-P330D CELL OVER VOLTAGE

DTC Logic

INFOID:000000007005792

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P3302	CELL OVER VOLTAGE MODULE1	When cell voltage exceeds the allowable working voltage range.	<ul style="list-style-type: none">• Overcharge caused by traction motor inverter/VCM malfunction• Module• Li-ion battery controller• Bus bar• Harness or connector
P3303	CELL OVER VOLTAGE MODULE2		
P3304	CELL OVER VOLTAGE MODULE3		
P3305	CELL OVER VOLTAGE MODULE4		
P3306	CELL OVER VOLTAGE MODULE5		
P3307	CELL OVER VOLTAGE MODULE6		
P3308	CELL OVER VOLTAGE MODULE7		
P3309	CELL OVER VOLTAGE MODULE8		
P330A	CELL OVER VOLTAGE MODULE9		
P330B	CELL OVER VOLTAGE MODULE10		
P330C	CELL OVER VOLTAGE MODULE11		
P330D	CELL OVER VOLTAGE MODULE12		

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

④ With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is any DTC detected?

- YES >> Refer to [EVB-91, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005793

WARNING:

- Because 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.
- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.
- Be sure to wear insulating protective gear consisting of glove, shoes and glasses/face shield before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.
- Refer to [EVB-5, "High Voltage Precautions"](#).

CAUTION:

There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.

1. CHECK SELF-DIAGNOSIS RESULTS

④ With CONSULT

1. Perform "All DTC Reading" with CONSULT.

P3302-P330D CELL OVER VOLTAGE

< DTC/CIRCUIT DIAGNOSIS >

2. Check "Self Diagnostic Result" of systems other than "HV BAT" if any DTC is detected.

Is any DTC detected?

YES >> After performing trouble diagnosis of detected DTC, GO TO 2.

NO >> GO TO 2.

2. PRECONDITIONING

WARNING:

Shut off high voltage circuit. Refer to [GI-31, "How to Cut Off High Voltage"](#).

1. Remove Li-ion battery. Refer to [EVb-136, "Removal and Installation"](#).

2. Remove battery pack upper case. Refer to [EVb-149, "BATTERY JUNCTION BOX : Disassembly and Assembly"](#), see Step-1 to Step-3.

>> GO TO 3.

3. CHECK HARNESS BETWEEN MODULE AND LI-ION BATTERY CONTROLLER

1. Disconnect module harness connector and Li-ion battery controller harness connector.

2. Refer to below table and check the continuity between corresponding module and Li-ion battery controller.

DTC	Module No.	Module		Li-ion battery controller		Continuity
		Connector	Terminal	Connector	Terminal	
P3302	1	LB9	17	LB13	33	Existed
			2		50	
			18		34	
P3303	2	LB9	18	LB13	34	Existed
			3		51	
			19		35	
P3304	3	LB9	19	LB13	35	Existed
			4		52	
			20		36	
P3305	4	LB9	20	LB13	36	Existed
			5		53	
			21		37	
P3306	5	LB9	21	LB13	37	Existed
			6		54	
			22		38	
P3307	6	LB9	22	LB13	38	Existed
			7		55	
			23		39	
P3308	7	LB9	23	LB13	39	Existed
			8		56	
			24		40	
P3309	8	LB9	24	LB13	40	Existed
			9		57	
			25		42	
P330A	9	LB9	25	LB13	42	Existed
			26		58	
			11		43	

P3302-P330D CELL OVER VOLTAGE

< DTC/CIRCUIT DIAGNOSIS >

DTC	Module No.	Module		Li-ion battery controller		Continuity
		Connector	Terminal	Connector	Terminal	
P330B	10	LB9	11	LB13	43	Existed
			27		59	
			12		44	
P330C	11	LB9	12	LB13	44	Existed
			28		60	
			13		45	
P330D	12	LB9	13	LB13	45	Existed
			29		61	
			14		46	

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.

4.CHECK MODULE VOLTAGE

Check voltage of corresponding module. Refer to [EVb-93, "Component Inspection"](#).

Is the inspection result normal?

YES >> Replace Li-ion battery controller. Refer to [EVb-155, "LI-ION BATTERY CONTROLLER : Disassembly and Assembly"](#).

NO >> Replace corresponding module. Refer to [EVb-143, "Exploded view"](#).

Component Inspection

INFOID:000000007005794

1.CHECK MODULE VOLTAGE

Check voltage of module.

A : + terminal (Red)

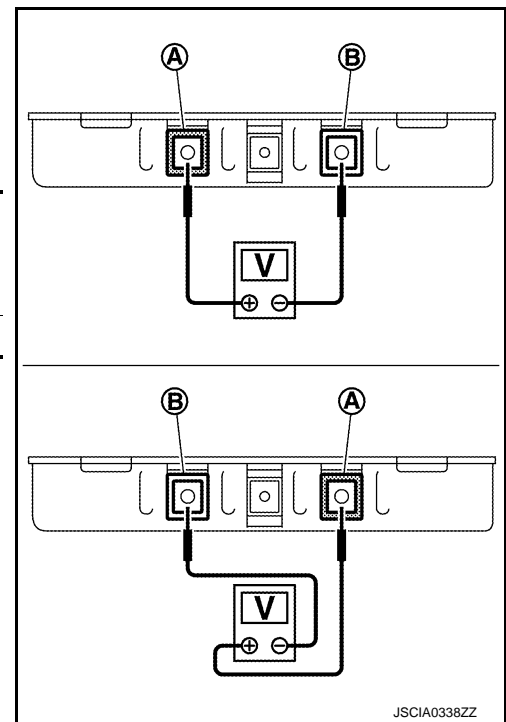
B : - terminal (Black)

Terminals		Voltage (Approx.)
(+)	(-)	
Module		5.0 - 8.5 V
+ terminal (Red)	- terminal (Black)	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace module. Refer to [EVb-143, "Exploded view"](#).



JSCIA0338ZZ

P330E-P3319 CELL OVER VOLTAGE

< DTC/CIRCUIT DIAGNOSIS >

P330E-P3319 CELL OVER VOLTAGE

DTC Logic

INFOID:000000007005795

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P3302	CELL OVER VOLTAGE MODULE1	When cell voltage exceeds the allowable working voltage range.	<ul style="list-style-type: none">• Overcharge caused by traction motor inverter/VCM malfunction• Module• Li-ion battery controller• Bus bar• Harness or connector
P3303	CELL OVER VOLTAGE MODULE2		
P3304	CELL OVER VOLTAGE MODULE3		
P3305	CELL OVER VOLTAGE MODULE4		
P3306	CELL OVER VOLTAGE MODULE5		
P3307	CELL OVER VOLTAGE MODULE6		
P3308	CELL OVER VOLTAGE MODULE7		
P3309	CELL OVER VOLTAGE MODULE8		
P330A	CELL OVER VOLTAGE MODULE9		
P330B	CELL OVER VOLTAGE MODULE10		
P330C	CELL OVER VOLTAGE MODULE11		
P330D	CELL OVER VOLTAGE MODULE12		

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

Ⓟ With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is any DTC detected?

- YES >> Refer to [EVB-100, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005796

WARNING:

- Because 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.
- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.
- Be sure to wear insulating protective gear consisting of glove, shoes and glasses/face shield before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.
- Refer to [EVB-5, "High Voltage Precautions"](#).

CAUTION:

There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.

1. CHECK SELF-DIAGNOSIS RESULTS

Ⓟ With CONSULT

1. Perform "All DTC Reading" with CONSULT.

P330E-P3319 CELL OVER VOLTAGE

< DTC/CIRCUIT DIAGNOSIS >

2. Check "Self Diagnostic Result" of systems other than "HV BAT" if any DTC is detected.

Is any DTC detected?

YES >> After performing trouble diagnosis of detected DTC, GO TO 2.

NO >> GO TO 2.

2. PRECONDITIONING

WARNING:

Shut off high voltage circuit. Refer to [GI-31, "How to Cut Off High Voltage"](#).

1. Remove Li-ion battery. Refer to [EVb-136, "Removal and Installation"](#).

2. Remove battery pack upper case. Refer to [EVb-149, "BATTERY JUNCTION BOX : Disassembly and Assembly"](#), see Step-1 to Step-3.

>> GO TO 3.

3. CHECK HARNESS BETWEEN MODULE AND LI-ION BATTERY CONTROLLER

1. Disconnect module harness connector and Li-ion battery controller harness connector.

2. Refer to below table and check the continuity between corresponding module and Li-ion battery controller.

DTC	Module No.	Module		Li-ion battery controller		Continuity
		Connector	Terminal	Connector	Terminal	
P3302	1	LB9	17	LB13	33	Existed
			2		50	
			18		34	
P3303	2	LB9	18	LB13	34	Existed
			3		51	
			19		35	
P3304	3	LB9	19	LB13	35	Existed
			4		52	
			20		36	
P3305	4	LB9	20	LB13	36	Existed
			5		53	
			21		37	
P3306	5	LB9	21	LB13	37	Existed
			6		54	
			22		38	
P3307	6	LB9	22	LB13	38	Existed
			7		55	
			23		39	
P3308	7	LB9	23	LB13	39	Existed
			8		56	
			24		40	
P3309	8	LB9	24	LB13	40	Existed
			9		57	
			25		42	
P330A	9	LB9	25	LB13	42	Existed
			26		58	
			11		43	

P330E-P3319 CELL OVER VOLTAGE

< DTC/CIRCUIT DIAGNOSIS >

DTC	Module No.	Module		Li-ion battery controller		Continuity
		Connector	Terminal	Connector	Terminal	
P330B	10	LB9	11	LB13	43	Existed
			27		59	
			12		44	
P330C	11	LB9	12	LB13	44	Existed
			28		60	
			13		45	
P330D	12	LB9	13	LB13	45	Existed
			29		61	
			14		46	

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.

4. CHECK MODULE VOLTAGE

Check voltage of corresponding module. Refer to [EVB-115, "Component Inspection"](#).

Is the inspection result normal?

YES >> Replace Li-ion battery controller. Refer to [EVB-155, "LI-ION BATTERY CONTROLLER : Disassembly and Assembly"](#).

NO >> Replace corresponding module. Refer to [EVB-143, "Exploded view"](#).

Component Inspection

INFOID:000000007005797

1. CHECK MODULE VOLTAGE

Check voltage of module.

A : + terminal (Red)

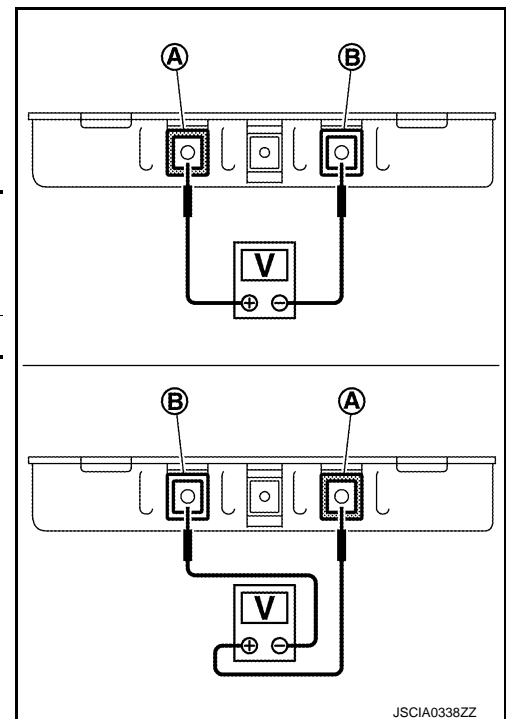
B : - terminal (Black)

Terminals		Voltage (Approx.)
(+)	(-)	
Module		5.0 - 8.5 V
+ terminal (Red)	- terminal (Black)	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace module. Refer to [EVB-143, "Exploded view"](#).



P331A-P3325 CELL OVER VOLTAGE

< DTC/CIRCUIT DIAGNOSIS >

P331A-P3325 CELL OVER VOLTAGE

DTC Logic

INFOID:000000007005798

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P3302	CELL OVER VOLTAGE MODULE1	When cell voltage exceeds the allowable working voltage range.	<ul style="list-style-type: none"> Overcharge caused by traction motor inverter/VCM malfunction Module Li-ion battery controller Bus bar Harness or connector
P3303	CELL OVER VOLTAGE MODULE2		
P3304	CELL OVER VOLTAGE MODULE3		
P3305	CELL OVER VOLTAGE MODULE4		
P3306	CELL OVER VOLTAGE MODULE5		
P3307	CELL OVER VOLTAGE MODULE6		
P3308	CELL OVER VOLTAGE MODULE7		
P3309	CELL OVER VOLTAGE MODULE8		
P330A	CELL OVER VOLTAGE MODULE9		
P330B	CELL OVER VOLTAGE MODULE10		
P330C	CELL OVER VOLTAGE MODULE11		
P330D	CELL OVER VOLTAGE MODULE12		

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

④ With CONSULT

- Power switch ON and wait for 10 seconds or more.
- Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
- Check DTC.

Is any DTC detected?

- YES >> Refer to [EVb-100, "Diagnosis Procedure"](#).
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005799

WARNING:

- Because 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.
- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.
- Be sure to wear insulating protective gear consisting of glove, shoes and glasses/face shield before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.
- Refer to [EVb-5, "High Voltage Precautions"](#).

CAUTION:

There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.

1. CHECK SELF-DIAGNOSIS RESULTS

④ With CONSULT

- Perform "All DTC Reading" with CONSULT.

P331A-P3325 CELL OVER VOLTAGE

< DTC/CIRCUIT DIAGNOSIS >

2. Check "Self Diagnostic Result" of systems other than "HV BAT" if any DTC is detected.

Is any DTC detected?

YES >> After performing trouble diagnosis of detected DTC, GO TO 2.

NO >> GO TO 2.

2. PRECONDITIONING

WARNING:

Shut off high voltage circuit. Refer to [GI-31, "How to Cut Off High Voltage"](#).

1. Remove Li-ion battery. Refer to [EVb-136, "Removal and Installation"](#).

2. Remove battery pack upper case. Refer to [EVb-149, "BATTERY JUNCTION BOX : Disassembly and Assembly"](#), see Step-1 to Step-3.

>> GO TO 3.

3. CHECK HARNESS BETWEEN MODULE AND LI-ION BATTERY CONTROLLER

1. Disconnect module harness connector and Li-ion battery controller harness connector.

2. Refer to below table and check the continuity between corresponding module and Li-ion battery controller.

DTC	Module No.	Module		Li-ion battery controller		Continuity
		Connector	Terminal	Connector	Terminal	
P3302	1	LB9	17	LB13	33	Existed
			2		50	
			18		34	
P3303	2	LB9	18	LB13	34	Existed
			3		51	
			19		35	
P3304	3	LB9	19	LB13	35	Existed
			4		52	
			20		36	
P3305	4	LB9	20	LB13	36	Existed
			5		53	
			21		37	
P3306	5	LB9	21	LB13	37	Existed
			6		54	
			22		38	
P3307	6	LB9	22	LB13	38	Existed
			7		55	
			23		39	
P3308	7	LB9	23	LB13	39	Existed
			8		56	
			24		40	
P3309	8	LB9	24	LB13	40	Existed
			9		57	
			25		42	
P330A	9	LB9	25	LB13	42	Existed
			26		58	
			11		43	

P331A-P3325 CELL OVER VOLTAGE

< DTC/CIRCUIT DIAGNOSIS >

DTC	Module No.	Module		Li-ion battery controller		Continuity
		Connector	Terminal	Connector	Terminal	
P330B	10	LB9	11	LB13	43	Existed
			27		59	
			12		44	
P330C	11	LB9	12	LB13	44	Existed
			28		60	
			13		45	
P330D	12	LB9	13	LB13	45	Existed
			29		61	
			14		46	

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.

4.CHECK MODULE VOLTAGE

Check voltage of corresponding module. Refer to [EVb-115, "Component Inspection"](#).

Is the inspection result normal?

YES >> Replace Li-ion battery controller. Refer to [EVb-155, "LI-ION BATTERY CONTROLLER : Disassembly and Assembly"](#).

NO >> Replace corresponding module. Refer to [EVb-143, "Exploded view"](#).

Component Inspection

INFOID:000000007005800

1.CHECK MODULE VOLTAGE

Check voltage of module.

A : + terminal (Red)

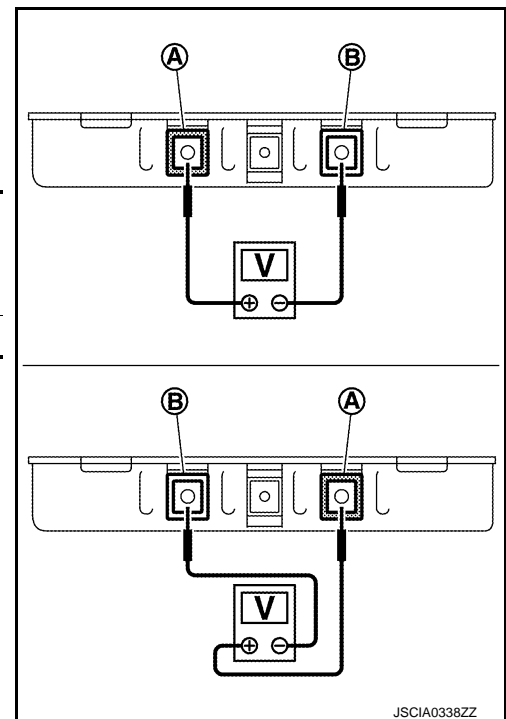
B : - terminal (Black)

Terminals		Voltage (Approx.)
(+)	(-)	
Module		5.0 - 8.5 V
+ terminal (Red)	- terminal (Black)	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace module. Refer to [EVb-143, "Exploded view"](#).



JSCIA0338ZZ

P3326-P3331 CELL OVER VOLTAGE

< DTC/CIRCUIT DIAGNOSIS >

P3326-P3331 CELL OVER VOLTAGE

DTC Logic

INFOID:000000007005801

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P3302	CELL OVER VOLTAGE MODULE1	When cell voltage exceeds the allowable working voltage range.	<ul style="list-style-type: none"> • Overcharge caused by traction motor inverter/VCM malfunction • Module • Li-ion battery controller • Bus bar • Harness or connector
P3303	CELL OVER VOLTAGE MODULE2		
P3304	CELL OVER VOLTAGE MODULE3		
P3305	CELL OVER VOLTAGE MODULE4		
P3306	CELL OVER VOLTAGE MODULE5		
P3307	CELL OVER VOLTAGE MODULE6		
P3308	CELL OVER VOLTAGE MODULE7		
P3309	CELL OVER VOLTAGE MODULE8		
P330A	CELL OVER VOLTAGE MODULE9		
P330B	CELL OVER VOLTAGE MODULE10		
P330C	CELL OVER VOLTAGE MODULE11		
P330D	CELL OVER VOLTAGE MODULE12		

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

Ⓜ With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is any DTC detected?

- YES >> Refer to [EVB-100, "Diagnosis Procedure"](#).
 NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005802

WARNING:

- Because 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.
- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.
- Be sure to wear insulating protective gear consisting of glove, shoes and glasses/face shield before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.
- Refer to [EVB-5, "High Voltage Precautions"](#).

CAUTION:

There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.

1. CHECK SELF-DIAGNOSIS RESULTS

Ⓜ With CONSULT

1. Perform "All DTC Reading" with CONSULT.

P3326-P3331 CELL OVER VOLTAGE

< DTC/CIRCUIT DIAGNOSIS >

2. Check "Self Diagnostic Result" of systems other than "HV BAT" if any DTC is detected.

Is any DTC detected?

YES >> After performing trouble diagnosis of detected DTC, GO TO 2.

NO >> GO TO 2.

2. PRECONDITIONING

WARNING:

Shut off high voltage circuit. Refer to [GI-31, "How to Cut Off High Voltage"](#).

1. Remove Li-ion battery. Refer to [EVB-136, "Removal and Installation"](#).

2. Remove battery pack upper case. Refer to [EVB-149, "BATTERY JUNCTION BOX : Disassembly and Assembly"](#), see Step-1 to Step-3.

>> GO TO 3.

3. CHECK HARNESS BETWEEN MODULE AND LI-ION BATTERY CONTROLLER

1. Disconnect module harness connector and Li-ion battery controller harness connector.

2. Refer to below table and check the continuity between corresponding module and Li-ion battery controller.

DTC	Module No.	Module		Li-ion battery controller		Continuity
		Connector	Terminal	Connector	Terminal	
P3302	1	LB9	17	LB13	33	Existed
			2		50	
			18		34	
P3303	2	LB9	18	LB13	34	Existed
			3		51	
			19		35	
P3304	3	LB9	19	LB13	35	Existed
			4		52	
			20		36	
P3305	4	LB9	20	LB13	36	Existed
			5		53	
			21		37	
P3306	5	LB9	21	LB13	37	Existed
			6		54	
			22		38	
P3307	6	LB9	22	LB13	38	Existed
			7		55	
			23		39	
P3308	7	LB9	23	LB13	39	Existed
			8		56	
			24		40	
P3309	8	LB9	24	LB13	40	Existed
			9		57	
			25		42	
P330A	9	LB9	25	LB13	42	Existed
			26		58	
			11		43	

P3326-P3331 CELL OVER VOLTAGE

< DTC/CIRCUIT DIAGNOSIS >

DTC	Module No.	Module		Li-ion battery controller		Continuity
		Connector	Terminal	Connector	Terminal	
P330B	10	LB9	11	LB13	43	Existed
			27		59	
			12		44	
P330C	11	LB9	12	LB13	44	Existed
			28		60	
			13		45	
P330D	12	LB9	13	LB13	45	Existed
			29		61	
			14		46	

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.

4. CHECK MODULE VOLTAGE

Check voltage of corresponding module. Refer to [EVB-115, "Component Inspection"](#).

Is the inspection result normal?

YES >> Replace Li-ion battery controller. Refer to [EVB-155, "LI-ION BATTERY CONTROLLER : Disassembly and Assembly"](#).

NO >> Replace corresponding module. Refer to [EVB-143, "Exploded view"](#).

Component Inspection

INFOID:000000007005803

1. CHECK MODULE VOLTAGE

Check voltage of module.

A : + terminal (Red)

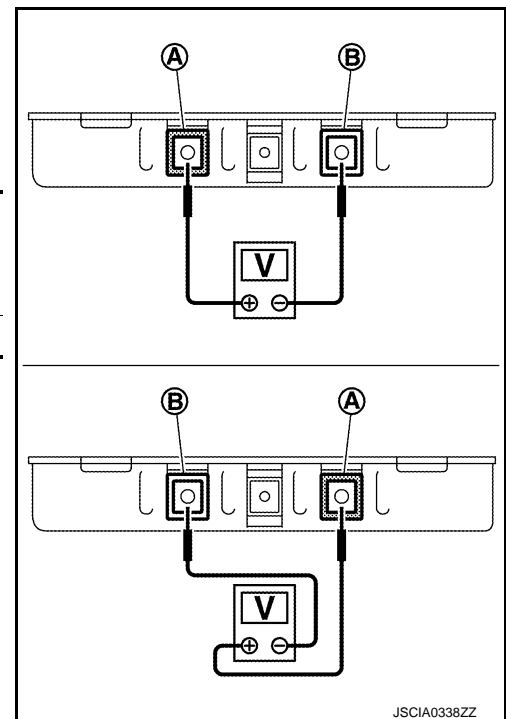
B : - terminal (Black)

Terminals		Voltage (Approx.)
(+)	(-)	
Module		5.0 - 8.5 V
+ terminal (Red)	- terminal (Black)	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace module. Refer to [EVB-143, "Exploded view"](#).



P3373 TOTAL VOLTAGE OVER DISCHARGE

< DTC/CIRCUIT DIAGNOSIS >

P3373 TOTAL VOLTAGE OVER DISCHARGE

DTC Logic

INFOID:000000007005804

DTC DETECTION LOGIC

If DTC P3373 is displayed with DTC P30F4, first perform the trouble diagnosis for P30F4. Refer to [EVB-75, "DTC Logic"](#).

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P3373	TOTAL VOLTAGE OVER DISCHARGE	When total voltage lowers below the allowable working voltage range.	<ul style="list-style-type: none">• Li-ion battery controller• Module• Bus bar• Service plug fuse• Overcharge caused by traction motor inverter/VCM malfunction• Harness or connector

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

④ With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is P3373 detected?

- YES >> Refer to [EVB-103, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005805

1. PERFORM THE SELF-DIAGNOSIS

④ With CONSULT

1. Perform "All DTC Reading" with CONSULT.
2. Select "Self Diagnostic Result" of systems other than "HV BAT" if any DTC is detected.

Is any DTC detected?

- YES >> After performing trouble diagnosis of detected DTC, GO TO 2.
NO >> GO TO 2.

2. PERFORM THE SELF-DIAGNOSIS OF LI-ION BATTERY CONTROLLER

④ With CONSULT

1. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
2. Confirm "Self Diagnostic Result" if "P3375"- "P33A4" is detected.

Is P3375-P33A4 detected?

- YES >> Perform diagnosis on the detected "P3375"- "P33A4". Refer to [EVB-104, "Diagnosis Procedure"](#).
NO >> Replace Li-ion battery controller. Refer to [EVB-155, "LI-ION BATTERY CONTROLLER : Disassembly and Assembly"](#).

P3375-P3380 CELL OVER DISCHARGE

< DTC/CIRCUIT DIAGNOSIS >

P3375-P3380 CELL OVER DISCHARGE

DTC Logic

INFOID:000000007005806

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P3375	CELL OVER DISCHARGE MODULE1	When cell voltage lowers below the allowable working voltage range.	<ul style="list-style-type: none">• Overcharge caused by traction motor inverter/VCM malfunction• Module• Li-ion battery controller• Bus bar• Harness or connector
P3376	CELL OVER DISCHARGE MODULE2		
P3377	CELL OVER DISCHARGE MODULE3		
P3378	CELL OVER DISCHARGE MODULE4		
P3379	CELL OVER DISCHARGE MODULE5		
P337A	CELL OVER DISCHARGE MODULE6		
P337B	CELL OVER DISCHARGE MODULE7		
P337C	CELL OVER DISCHARGE MODULE8		
P337D	CELL OVER DISCHARGE MODULE9		
P337E	CELL OVER DISCHARGE MODULE10		
P337F	CELL OVER DISCHARGE MODULE11		
P3380	CELL OVER DISCHARGE MODULE12		

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

Ⓟ With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is any DTC detected?

- YES >> Refer to [EVB-104, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005807

WARNING:

- Because 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.
- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.
- Be sure to wear insulating protective gear consisting of glove, shoes and glasses/face shield before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.
- Refer to [EVB-5, "High Voltage Precautions"](#).

CAUTION:

There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.

1. CHECK SELF-DIAGNOSIS RESULTS

Ⓟ With CONSULT

1. Perform "All DTC Reading" with CONSULT.

P3375-P3380 CELL OVER DISCHARGE

< DTC/CIRCUIT DIAGNOSIS >

2. Check "Self Diagnostic Result" of systems other than "" if any DTC is detected.

Is any DTC detected?

YES >> After performing trouble diagnosis of detected DTC, GO TO 2.

NO >> GO TO 2.

2. PRECONDITIONING

WARNING:

Shut off high voltage circuit. Refer to [GI-31, "How to Cut Off High Voltage"](#).

1. Remove Li-ion battery. Refer to [EV-136, "Removal and Installation"](#).

2. Remove battery pack upper case. Refer to [EV-149, "BATTERY JUNCTION BOX : Disassembly and Assembly"](#), see Step-1 to Step-3.

>> GO TO 3.

3. CHECK HARNESS BETWEEN MODULE AND LI-ION BATTERY CONTROLLER

1. Disconnect module harness connector and Li-ion battery controller harness connector.

2. Refer to below table and check the continuity between corresponding module and Li-ion battery controller.

DTC	Module No.	Module		Li-ion battery controller		Continuity
		Connector	Terminal	Connector	Terminal	
P3375	1	LB9	17	LB13	33	Existed
			2		50	
			18		34	
P3376	2	LB9	18	LB13	34	Existed
			3		51	
			19		35	
P3377	3	LB9	19	LB13	35	Existed
			4		52	
			20		36	
P3378	4	LB9	20	LB13	36	Existed
			5		53	
			21		37	
P3379	5	LB9	21	LB13	37	Existed
			6		54	
			22		38	
P337A	6	LB9	22	LB13	38	Existed
			7		55	
			23		39	
P337B	7	LB9	23	LB13	39	Existed
			8		56	
			24		40	
P337C	8	LB9	24	LB13	40	Existed
			9		57	
			25		42	
P337D	9	LB9	25	LB13	42	Existed
			26		58	
			11		43	

P3375-P3380 CELL OVER DISCHARGE

< DTC/CIRCUIT DIAGNOSIS >

DTC	Module No.	Module		Li-ion battery controller		Continuity
		Connector	Terminal	Connector	Terminal	
P337E	10	LB9	11	LB13	43	Existed
			27		59	
			12		44	
P330F	11	LB9	12	LB13	44	Existed
			28		60	
			13		45	
P3380	12	LB9	13	LB13	45	Existed
			29		61	
			14		46	

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair Harness or connector.

4. CHECK MODULE VOLTAGE

Check voltage of corresponding module. Refer to [EVB-93, "Component Inspection"](#).

Is the inspection result normal?

YES >> Replace Li-ion battery controller. Refer to [EVB-155, "LI-ION BATTERY CONTROLLER : Disassembly and Assembly"](#).

NO >> Replace corresponding module. Refer to [EVB-143, "Exploded view"](#).

Component Inspection

INFOID:000000007005808

1. CHECK MODULE VOLTAGE

Check voltage of module.

A : + terminal (Red)

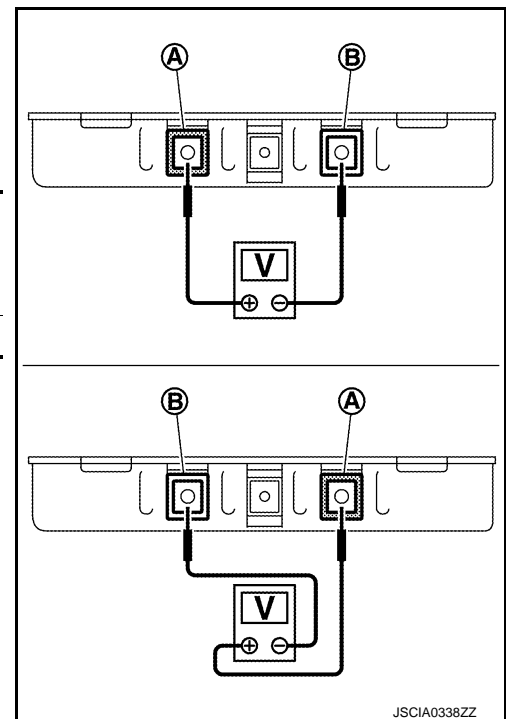
B : - terminal (Black)

Terminals		Voltage (Approx.)
(+)	(-)	
Module		5.0 - 8.5 V
+ terminal (Red)	- terminal (Black)	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace module. Refer to [EVB-143, "Exploded view"](#).



P3381-P338C CELL OVER DISCHARGE

< DTC/CIRCUIT DIAGNOSIS >

P3381-P338C CELL OVER DISCHARGE

DTC Logic

INFOID:000000007005809

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P3375	CELL OVER DISCHARGE MODULE1	When cell voltage lowers below the allowable working voltage range.	<ul style="list-style-type: none"> Overcharge caused by traction motor inverter/VCM malfunction Module Li-ion battery controller Bus bar Harness or connector
P3376	CELL OVER DISCHARGE MODULE2		
P3377	CELL OVER DISCHARGE MODULE3		
P3378	CELL OVER DISCHARGE MODULE4		
P3379	CELL OVER DISCHARGE MODULE5		
P337A	CELL OVER DISCHARGE MODULE6		
P337B	CELL OVER DISCHARGE MODULE7		
P337C	CELL OVER DISCHARGE MODULE8		
P337D	CELL OVER DISCHARGE MODULE9		
P337E	CELL OVER DISCHARGE MODULE10		
P337F	CELL OVER DISCHARGE MODULE11		
P3380	CELL OVER DISCHARGE MODULE12		

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

④ With CONSULT

- Power switch ON and wait for 10 seconds or more.
- Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
- Check DTC.

Is any DTC detected?

- YES >> Refer to [EV-113, "Diagnosis Procedure"](#).
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005810

WARNING:

- Because 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.
- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.
- Be sure to wear insulating protective gear consisting of glove, shoes and glasses/face shield before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.
- Refer to [EV-5, "High Voltage Precautions"](#).

CAUTION:

There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.

1. CHECK SELF-DIAGNOSIS RESULTS

④ With CONSULT

- Perform "All DTC Reading" with CONSULT.

P3381-P338C CELL OVER DISCHARGE

< DTC/CIRCUIT DIAGNOSIS >

2. Check "Self Diagnostic Result" of systems other than "" if any DTC is detected.

Is any DTC detected?

YES >> After performing trouble diagnosis of detected DTC, GO TO 2.

NO >> GO TO 2.

2. PRECONDITIONING

WARNING:

Shut off high voltage circuit. Refer to [GI-31, "How to Cut Off High Voltage"](#).

1. Remove Li-ion battery. Refer to [EVb-136, "Removal and Installation"](#).

2. Remove battery pack upper case. Refer to [EVb-149, "BATTERY JUNCTION BOX : Disassembly and Assembly"](#), see Step-1 to Step-3.

>> GO TO 3.

3. CHECK HARNESS BETWEEN MODULE AND LI-ION BATTERY CONTROLLER

1. Disconnect module harness connector and Li-ion battery controller harness connector.

2. Refer to below table and check the continuity between corresponding module and Li-ion battery controller.

DTC	Module No.	Module		Li-ion battery controller		Continuity
		Connector	Terminal	Connector	Terminal	
P3375	1	LB9	17	LB13	33	Existed
			2		50	
			18		34	
P3376	2	LB9	18	LB13	34	Existed
			3		51	
			19		35	
P3377	3	LB9	19	LB13	35	Existed
			4		52	
			20		36	
P3378	4	LB9	20	LB13	36	Existed
			5		53	
			21		37	
P3379	5	LB9	21	LB13	37	Existed
			6		54	
			22		38	
P337A	6	LB9	22	LB13	38	Existed
			7		55	
			23		39	
P337B	7	LB9	23	LB13	39	Existed
			8		56	
			24		40	
P337C	8	LB9	24	LB13	40	Existed
			9		57	
			25		42	
P337D	9	LB9	25	LB13	42	Existed
			26		58	
			11		43	

P3381-P338C CELL OVER DISCHARGE

< DTC/CIRCUIT DIAGNOSIS >

DTC	Module No.	Module		Li-ion battery controller		Continuity
		Connector	Terminal	Connector	Terminal	
P337E	10	LB9	11	LB13	43	Existed
			27		59	
			12		44	
P330F	11	LB9	12	LB13	44	Existed
			28		60	
			13		45	
P3380	12	LB9	13	LB13	45	Existed
			29		61	
			14		46	

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair Harness or connector.

4.CHECK MODULE VOLTAGE

Check voltage of corresponding module. Refer to [EVB-115, "Component Inspection"](#).

Is the inspection result normal?

YES >> Replace Li-ion battery controller. Refer to [EVB-155, "LI-ION BATTERY CONTROLLER : Disassembly and Assembly"](#).

NO >> Replace corresponding module. Refer to [EVB-143, "Exploded view"](#).

Component Inspection

INFOID:000000007005811

1.CHECK MODULE VOLTAGE

Check voltage of module.

A : + terminal (Red)

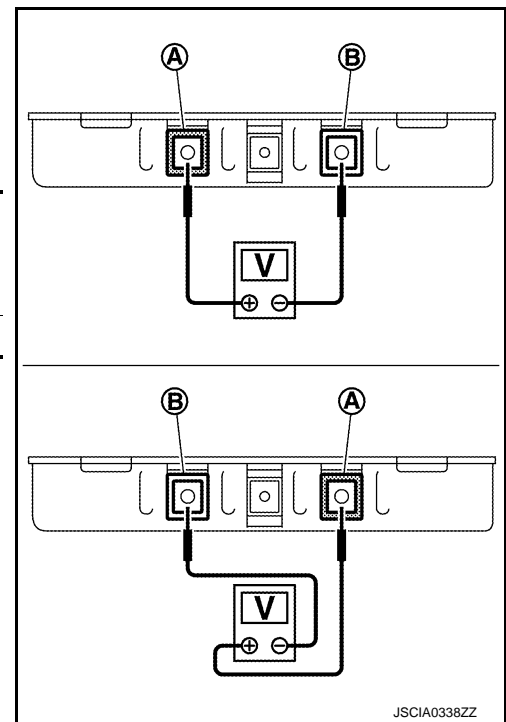
B : - terminal (Black)

Terminals		Voltage (Approx.)
(+)	(-)	
Module		5.0 - 8.5 V
+ terminal (Red)	- terminal (Black)	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace module. Refer to [EVB-143, "Exploded view"](#).



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P338D-P3398 CELL OVER DISCHARGE

< DTC/CIRCUIT DIAGNOSIS >

P338D-P3398 CELL OVER DISCHARGE

DTC Logic

INFOID:000000007005812

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P3375	CELL OVER DISCHARGE MODULE1	When cell voltage lowers below the allowable working voltage range.	<ul style="list-style-type: none"> Overcharge caused by traction motor inverter/VCM malfunction Module Li-ion battery controller Bus bar Harness or connector
P3376	CELL OVER DISCHARGE MODULE2		
P3377	CELL OVER DISCHARGE MODULE3		
P3378	CELL OVER DISCHARGE MODULE4		
P3379	CELL OVER DISCHARGE MODULE5		
P337A	CELL OVER DISCHARGE MODULE6		
P337B	CELL OVER DISCHARGE MODULE7		
P337C	CELL OVER DISCHARGE MODULE8		
P337D	CELL OVER DISCHARGE MODULE9		
P337E	CELL OVER DISCHARGE MODULE10		
P337F	CELL OVER DISCHARGE MODULE11		
P3380	CELL OVER DISCHARGE MODULE12		

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

Ⓜ With CONSULT

- Power switch ON and wait for 10 seconds or more.
- Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
- Check DTC.

Is any DTC detected?

- YES >> Refer to [EVB-113, "Diagnosis Procedure"](#).
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005813

WARNING:

- Because 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.
- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.
- Be sure to wear insulating protective gear consisting of glove, shoes and glasses/face shield before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.
- Refer to [EVB-5, "High Voltage Precautions"](#).

CAUTION:

There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.

1. CHECK SELF-DIAGNOSIS RESULTS

Ⓜ With CONSULT

- Perform "All DTC Reading" with CONSULT.

P338D-P3398 CELL OVER DISCHARGE

< DTC/CIRCUIT DIAGNOSIS >

2. Check "Self Diagnostic Result" of systems other than "" if any DTC is detected.

Is any DTC detected?

YES >> After performing trouble diagnosis of detected DTC, GO TO 2.

NO >> GO TO 2.

2. PRECONDITIONING

WARNING:

Shut off high voltage circuit. Refer to [GI-31, "How to Cut Off High Voltage"](#).

1. Remove Li-ion battery. Refer to [EVB-136, "Removal and Installation"](#).

2. Remove battery pack upper case. Refer to [EVB-149, "BATTERY JUNCTION BOX : Disassembly and Assembly"](#), see Step-1 to Step-3.

>> GO TO 3.

3. CHECK HARNESS BETWEEN MODULE AND LI-ION BATTERY CONTROLLER

1. Disconnect module harness connector and Li-ion battery controller harness connector.

2. Refer to below table and check the continuity between corresponding module and Li-ion battery controller.

DTC	Module No.	Module		Li-ion battery controller		Continuity
		Connector	Terminal	Connector	Terminal	
P3375	1	LB9	17	LB13	33	Existed
			2		50	
			18		34	
P3376	2	LB9	18	LB13	34	Existed
			3		51	
			19		35	
P3377	3	LB9	19	LB13	35	Existed
			4		52	
			20		36	
P3378	4	LB9	20	LB13	36	Existed
			5		53	
			21		37	
P3379	5	LB9	21	LB13	37	Existed
			6		54	
			22		38	
P337A	6	LB9	22	LB13	38	Existed
			7		55	
			23		39	
P337B	7	LB9	23	LB13	39	Existed
			8		56	
			24		40	
P337C	8	LB9	24	LB13	40	Existed
			9		57	
			25		42	
P337D	9	LB9	25	LB13	42	Existed
			26		58	
			11		43	

P338D-P3398 CELL OVER DISCHARGE

< DTC/CIRCUIT DIAGNOSIS >

DTC	Module No.	Module		Li-ion battery controller		Continuity
		Connector	Terminal	Connector	Terminal	
P337E	10	LB9	11	LB13	43	Existed
			27		59	
			12		44	
P330F	11	LB9	12	LB13	44	Existed
			28		60	
			13		45	
P3380	12	LB9	13	LB13	45	Existed
			29		61	
			14		46	

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair Harness or connector.

4.CHECK MODULE VOLTAGE

Check voltage of corresponding module. Refer to [EVB-115, "Component Inspection"](#).

Is the inspection result normal?

YES >> Replace Li-ion battery controller. Refer to [EVB-155, "LI-ION BATTERY CONTROLLER : Disassembly and Assembly"](#).

NO >> Replace corresponding module. Refer to [EVB-143, "Exploded view"](#).

Component Inspection

INFOID:000000007005814

1.CHECK MODULE VOLTAGE

Check voltage of module.

A : + terminal (Red)

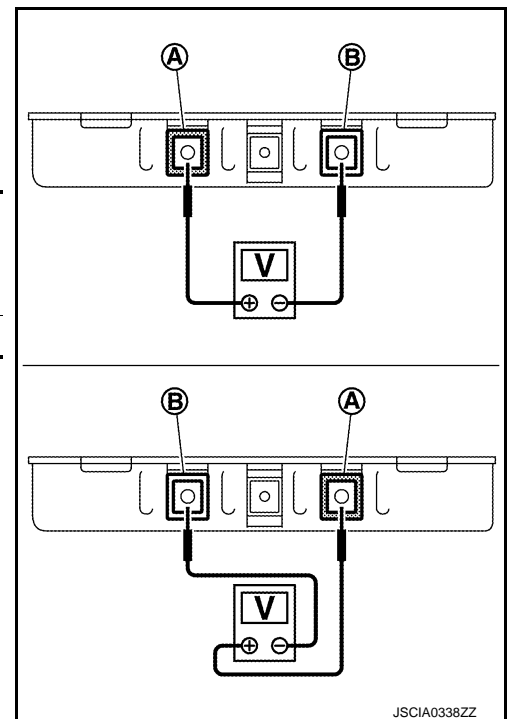
B : - terminal (Black)

Terminals		Voltage (Approx.)
(+)	(-)	
Module		5.0 - 8.5 V
+ terminal (Red)	- terminal (Black)	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace module. Refer to [EVB-143, "Exploded view"](#).



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P3399-P33A4 CELL OVER DISCHARGE

< DTC/CIRCUIT DIAGNOSIS >

P3399-P33A4 CELL OVER DISCHARGE

DTC Logic

INFOID:000000007005815

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P3375	CELL OVER DISCHARGE MODULE1	When cell voltage lowers below the allowable working voltage range.	<ul style="list-style-type: none"> Overcharge caused by traction motor inverter/VCM malfunction Module Li-ion battery controller Bus bar Harness or connector
P3376	CELL OVER DISCHARGE MODULE2		
P3377	CELL OVER DISCHARGE MODULE3		
P3378	CELL OVER DISCHARGE MODULE4		
P3379	CELL OVER DISCHARGE MODULE5		
P337A	CELL OVER DISCHARGE MODULE6		
P337B	CELL OVER DISCHARGE MODULE7		
P337C	CELL OVER DISCHARGE MODULE8		
P337D	CELL OVER DISCHARGE MODULE9		
P337E	CELL OVER DISCHARGE MODULE10		
P337F	CELL OVER DISCHARGE MODULE11		
P3380	CELL OVER DISCHARGE MODULE12		

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

④ With CONSULT

- Power switch ON and wait for 10 seconds or more.
- Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
- Check DTC.

Is any DTC detected?

- YES >> Refer to [EV-113, "Diagnosis Procedure"](#).
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005816

WARNING:

- Because 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.
- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.
- Be sure to wear insulating protective gear consisting of glove, shoes and glasses/face shield before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.
- Refer to [EV-5, "High Voltage Precautions"](#).

CAUTION:

There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.

1. CHECK SELF-DIAGNOSIS RESULTS

④ With CONSULT

- Perform "All DTC Reading" with CONSULT.

P3399-P33A4 CELL OVER DISCHARGE

< DTC/CIRCUIT DIAGNOSIS >

2. Check "Self Diagnostic Result" of systems other than "" if any DTC is detected.

Is any DTC detected?

YES >> After performing trouble diagnosis of detected DTC, GO TO 2.

NO >> GO TO 2.

2. PRECONDITIONING

WARNING:

Shut off high voltage circuit. Refer to [GI-31, "How to Cut Off High Voltage"](#).

1. Remove Li-ion battery. Refer to [EVB-136, "Removal and Installation"](#).

2. Remove battery pack upper case. Refer to [EVB-149, "BATTERY JUNCTION BOX : Disassembly and Assembly"](#), see Step-1 to Step-3.

>> GO TO 3.

3. CHECK HARNESS BETWEEN MODULE AND LI-ION BATTERY CONTROLLER

1. Disconnect module harness connector and Li-ion battery controller harness connector.

2. Refer to below table and check the continuity between corresponding module and Li-ion battery controller.

DTC	Module No.	Module		Li-ion battery controller		Continuity
		Connector	Terminal	Connector	Terminal	
P3375	1	LB9	17	LB13	33	Existed
			2		50	
			18		34	
P3376	2	LB9	18	LB13	34	Existed
			3		51	
			19		35	
P3377	3	LB9	19	LB13	35	Existed
			4		52	
			20		36	
P3378	4	LB9	20	LB13	36	Existed
			5		53	
			21		37	
P3379	5	LB9	21	LB13	37	Existed
			6		54	
			22		38	
P337A	6	LB9	22	LB13	38	Existed
			7		55	
			23		39	
P337B	7	LB9	23	LB13	39	Existed
			8		56	
			24		40	
P337C	8	LB9	24	LB13	40	Existed
			9		57	
			25		42	
P337D	9	LB9	25	LB13	42	Existed
			26		58	
			11		43	

P3399-P33A4 CELL OVER DISCHARGE

< DTC/CIRCUIT DIAGNOSIS >

DTC	Module No.	Module		Li-ion battery controller		Continuity
		Connector	Terminal	Connector	Terminal	
P337E	10	LB9	11	LB13	43	Existed
			27		59	
			12		44	
P330F	11	LB9	12	LB13	44	Existed
			28		60	
			13		45	
P3380	12	LB9	13	LB13	45	Existed
			29		61	
			14		46	

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair Harness or connector.

4.CHECK MODULE VOLTAGE

Check voltage of corresponding module. Refer to [EVB-115, "Component Inspection"](#).

Is the inspection result normal?

YES >> Replace Li-ion battery controller. Refer to [EVB-155, "LI-ION BATTERY CONTROLLER : Disassembly and Assembly"](#).

NO >> Replace corresponding module. Refer to [EVB-143, "Exploded view"](#).

Component Inspection

INFOID:000000007005817

1.CHECK MODULE VOLTAGE

Check voltage of module.

A : + terminal (Red)

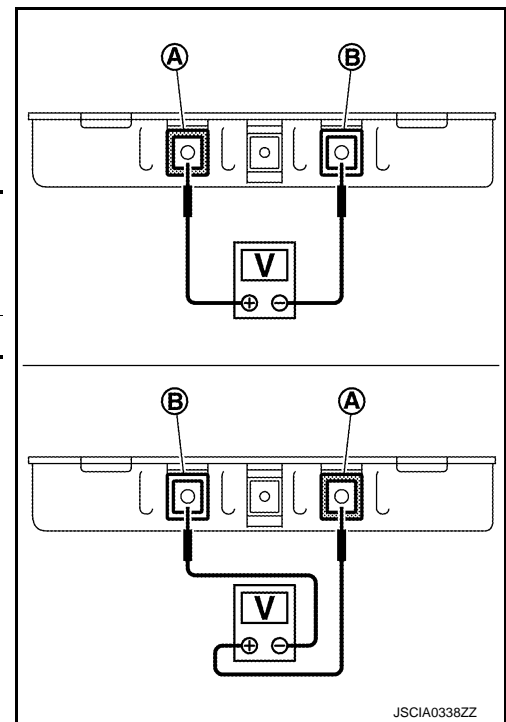
B : - terminal (Black)

Terminals		Voltage (Approx.)
(+)	(-)	
Module		5.0 - 8.5 V
+ terminal (Red)	- terminal (Black)	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace module. Refer to [EVB-143, "Exploded view"](#).



P33D4 BATTERY DETERIORATION DIAGNOSIS

< DTC/CIRCUIT DIAGNOSIS >

P33D4 BATTERY DETERIORATION DIAGNOSIS

DTC Logic

INFOID:000000007005818

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P33D4	BATTERY INTERNAL RESISTANCE DIAG	When the battery charge lowers. (The internal resistance of the battery increases.)	Li-ion battery

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

④ With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is P33D4 detected?

- YES >> Refer to [EVB-116, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005819

When this DTC is detected, replace Li-ion battery. Refer to [EVB-136, "Removal and Installation"](#).

P33D5 CURRENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P33D5 CURRENT SENSOR

DTC Logic

INFOID:000000007005820

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P33D5	CURRENT SENSOR	Deviation in characteristics of battery current sensor signal voltage. (Battery current sensor signal voltage is too high or too low.)	<ul style="list-style-type: none">• Li-ion battery controller• Current sensor• System main relay• Harness or connector

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

④ With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is P33D5 detected?

- YES >> Refer to [EV B-117, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005821

WARNING:

- Because 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.
- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.
- Be sure to wear insulating protective gear consisting of glove, shoes and glasses/face shield before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.
- Refer to [EV B-5, "High Voltage Precautions"](#).

CAUTION:

There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.

1. CHECK SELF-DIAGNOSIS RESULTS OF VCM

④ With CONSULT

1. Select "Self Diagnostic Result" mode of "EV/HEV" using CONSULT.
2. Confirm self diagnostic result if "P0AA0", "P0AA1" or "P0AA4" is detected.

Is any DTC detected?

- YES >> Perform diagnosis on the detected DTC. Refer to [EVC-78, "DTC Index"](#).
NO >> GO TO 2.

2. PRECONDITIONING

WARNING:

Shut off high voltage circuit. Refer to [GI-31, "How to Cut Off High Voltage"](#).

1. Remove Li-ion battery. Refer to [EV B-136, "Removal and Installation"](#).
2. Remove battery pack upper case. Refer to [EV B-149, "BATTERY JUNCTION BOX : Disassembly and Assembly"](#), see Step-1 to Step-3.

P33D5 CURRENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

>> GO TO 3.

3.CHECK CONNECTION STATUS

Check connection status of Li-ion battery controller harness connector and battery junction box (current sensor) harness connector.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Recover the connection status.

4.CHECK HARNESS BETWEEN BATTERY JUNCTION BOX (CURRENT SENSOR) AND LI-ION BATTERY CONTROLLER

Check continuity between battery junction box (current sensor) harness connector and Li-ion battery controller harness connector.

Battery junction box (Current sensor)		Li-ion battery controller		Continuity
Connector	Terminal	Connector	Terminal	
LB3	9	LB11	10	Exited
	3		9	
	10		17	

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair Harness or connector.

5.CHECK CURRENT SENSOR

Check resistance of current sensor.

Battery junction box (Current sensor)			Resistance value
Connector	Terminal	Terminal	
LB3	9	10	1 k Ω –10 M Ω
	3	10	

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace current sensor.

6.CHECK LI-ION BATTERY CONTROLLER

Check resistance of Li-ion battery controller.

Li-ion battery controller			Resistance value (k Ω)
Connector	Terminal	Terminal	
LB11	10	17	Approx. 4.7

Is the inspection result normal?

YES >> Replace battery junction box. Refer to [EVB-149, "BATTERY JUNCTION BOX : Disassembly and Assembly"](#).

NO >> Replace Li-ion battery controller. Refer to [EVB-155, "LI-ION BATTERY CONTROLLER : Disassembly and Assembly"](#).

P33D6 CURRENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P33D6 CURRENT SENSOR

DTC Logic

INFOID:000000007005822

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P33D6	CURRENT SENSOR	Deviation from the specified voltage characteristics of battery current sensor.	Li-ion battery controller

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B
EVB

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

④ With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is P33D6 detected?

- YES >> Refer to [EVb-119, "Diagnosis Procedure"](#).
- NO >> INSPECTION END

D
E
F
G

Diagnosis Procedure

INFOID:000000007005823

WARNING:

- Because 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.
- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.
- Be sure to wear insulating protective gear consisting of glove, shoes and glasses/face shield before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.
- Refer to [EVb-5, "High Voltage Precautions"](#).

CAUTION:

There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.

1. PRECONDITIONING

WARNING:

Shut off high voltage circuit. Refer to [GI-31, "How to Cut Off High Voltage"](#).

1. Remove Li-ion battery. Refer to [EVb-136, "Removal and Installation"](#).
2. Remove battery pack upper case. Refer to [EVb-149, "BATTERY JUNCTION BOX : Disassembly and Assembly"](#), see Step-1 to Step-3.

>> GO TO 2.

2. CHECK CURRENT SENSOR

1. Disconnect Li-ion battery controller harness connector.
2. Check the resistance of current sensor from Li-ion battery controller side.

Li-ion battery controller		Resistance value
Connector	Terminal	

H
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J
K
L
M
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O
P

P33D6 CURRENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

LB11	10	9	1 kΩ–10 MΩ
	9	17	

Is the inspection result normal?

YES >> Replace Li-ion battery controller. Refer to [EVB-155. "LI-ION BATTERY CONTROLLER : Disassembly and Assembly"](#).

NO >> GO TO 3.

3. CHECK HARNESS BETWEEN LI-ION BATTERY CONTROLLER AND BATTERY JUNCTION BOX (CURRENT SENSOR)

1. Disconnect Battery junction box harness connector.
2. Check continuity between li-ion battery controller and Battery junction box (current sensor).

li-ion battery controller		Battery junction box (Current sensor)		Continuity
Connector	Terminal	Connector	Terminal	
LB11	10	LB3	9	Existed
	9		3	
	17		10	

Is the inspection result normal?

YES >> Replace battery junction box. Refer to [EVB-149. "BATTERY JUNCTION BOX : Disassembly and Assembly"](#).

NO >> Repair Harness or connector.

P33D7, P33D9, P33DB, P33DD TEMPERATURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P33D7, P33D9, P33DB, P33DD TEMPERATURE SENSOR

DTC Logic

INFOID:000000007005824

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P33D7	TEMPERATURE SENSOR	Battery temperature sensor rear center signal voltage is too high or too low.	<ul style="list-style-type: none"> Battery temperature sensor 1 Li-ion battery controller Harness or connector
P33D9		Battery temperature sensor front RH signal voltage is too high or too low.	
P33DB		Battery temperature sensor rear RH signal voltage is too high or too low.	
P33DD		Battery temperature sensor front LH signal voltage is too high or too low.	

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

④ With CONSULT

- Power switch ON and wait for 10 seconds or more.
- Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
- Check DTC.

Is any DTC detected?

- YES >> Refer to [EVB-121, "Diagnosis Procedure"](#).
 NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005825

WARNING:

- Because 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.
- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.
- Be sure to wear insulating protective gear consisting of glove, shoes and glasses/face shield before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.
- Refer to [EVB-5, "High Voltage Precautions"](#).

CAUTION:

There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.

1. PRECONDITIONING

WARNING:

Shut off high voltage circuit. Refer to [GI-31, "How to Cut Off High Voltage"](#).

- Remove Li-ion battery. Refer to [EVB-136, "Removal and Installation"](#).
- Remove battery pack upper case. Refer to [EVB-149, "BATTERY JUNCTION BOX : Disassembly and Assembly"](#), see Step-1 to Step-3.

>> GO TO 2.

P33D7, P33D9, P33DB, P33DD TEMPERATURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

2.CHECK HARNESS

1. Power switch OFF.
2. Check a connection state of harness connector of Li-ion battery controller.

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Recover the connection status.

3.CHECK BATTERY TEMPERATURE SENSOR

Refer to [EVB-122. "Component Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 4.
NO >> Replace battery temperature sensor.

4.CHECK HARNESS BETWEEN BATTERY TEMPERATURE SENSOR AND GROUND

1. Disconnect Li-ion battery controller harness connector.
2. Check continuity between battery temperature sensor harness connector and ground.

Battery temperature sensor	Connector	Terminal	—	Continuity
Rear center	LB17	3	Ground	No existed
Front RH	LB5	1		
Rear RH	LB17	1		
Front LH	LB4	3		

Is the inspection result normal?

- YES >> Replace Li-ion battery controller. Refer to [EVB-155. "LI-ION BATTERY CONTROLLER : Disassembly and Assembly"](#).
NO >> Repair harness or connector.

Component Inspection

INFOID:000000007005826

1.CHECK BATTERY TEMPERATURE SENSOR

1. Remove battery temperature sensor. Refer to [EVB-143. "Exploded view"](#).
2. Check resistance between battery temperature sensor terminals.

Battery temperature sensor	Terminals	Condition	Resistance (kΩ)
Rear RH & Front RH	1 and 2	Temperature °C (°F)	10 (50) Approx. 7.4
Rear center & Front LH	3 and 4		25 (77) Approx. 4.0
			40 (104) Approx. 2.3

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Replace battery temperature sensor.

P33DF BAT VOLTAGE ISOLATION SEN

< DTC/CIRCUIT DIAGNOSIS >

P33DF BAT VOLTAGE ISOLATION SEN

DTC Logic

INFOID:000000007005827

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P33DF	BAT VOLTAGE ISOLATION SEN	Signal voltage of the on-board isolation resistance monitoring system is too high.	Li-ion battery controller

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EVB
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DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

④ With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is P33DF detected?

- YES >> Refer to [EVB-123, "Diagnosis Procedure"](#).
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005828

When this DTC is detected, replace Li-ion battery controller. Refer to [EVB-155, "LI-ION BATTERY CONTROLLER : Disassembly and Assembly"](#).

P33E0 BAT VOLTAGE ISOLATION SEN

< DTC/CIRCUIT DIAGNOSIS >

P33E0 BAT VOLTAGE ISOLATION SEN

DTC Logic

INFOID:000000007005829

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P33E0	BATTERY VOLTAGE ISOLATION SENSOR	Signal Voltage of the on-board isolation resistance monitoring system is too low.	Li-ion battery controller

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

④ With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is P33E0 detected?

- YES >> Refer to [EVB-124, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005830

When this DTC is detected, replace Li-ion battery controller. Refer to [EVB-155, "LI-ION BATTERY CONTROLLER : Disassembly and Assembly"](#).

P33E1 BAT VOLTAGE ISOLATION SEN

< DTC/CIRCUIT DIAGNOSIS >

P33E1 BAT VOLTAGE ISOLATION SEN

DTC Logic

INFOID:000000007005831

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P33E1	BATTERY VOLTAGE ISOLATION SENSOR	Signal voltage of the on-board isolation resistance monitoring system exhibits no amplitude variation.	Li-ion battery controller

A
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EVB
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DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

④ With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is P33E1 detected?

- YES >> Refer to [EVB-125, "Diagnosis Procedure"](#).
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005832

When this DTC is detected, replace Li-ion battery controller. Refer to [EVB-155, "LI-ION BATTERY CONTROLLER : Disassembly and Assembly"](#).

P33E2 BATT PACK OVER TEMP

< DTC/CIRCUIT DIAGNOSIS >

P33E2 BATT PACK OVER TEMP

DTC Logic

INFOID:000000007005833

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P33E2	BATTERY PACK OVER TEMPERATURE	When the battery (battery pack) temperature is excessively high.	Overcharge caused by traction motor inverter/VCM malfunction

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

④ With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is P33E2 detected?

- YES >> Refer to [EVB-126, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005834

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

④ With CONSULT

1. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
2. Confirm self diagnostic result if "P33E4" or "P33E5" is detected.

Is P33E4 or P33E5 detected?

- YES >> Perform diagnosis on the detected "P33E4" or "P33E5". Refer to [EVB-127, "Diagnosis Procedure"](#).
NO >> GO TO 2.

2. CHECK BATTERY TEMPERATURE SENSOR

④ With CONSULT

Using FFD, check the values of four temperature sensors when DTC is detected.

Monitor item	Condition	Limit
Battery temperature sensor 1	Power switch ON	55°C (131°F) or less
Battery temperature sensor 2		
Battery temperature sensor 3		
Battery temperature sensor 4		

Is there temperature increase?

- Temperature increase is seen>>Replace Li-ion battery. Refer to [EVB-136, "Removal and Installation"](#).
Temperature increase is not seen>>Replace battery temperature sensors. Refer to [EVB-136, "Removal and Installation"](#).

P33E4, P33E5 TEMPERATURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P33E4, P33E5 TEMPERATURE SENSOR

DTC Logic

INFOID:000000007005835

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P33E4	TEMPERATURE SENSOR	Deviation in characteristics of Battery temperature sensor rear center or front RH.	Battery temperature sensor
P33E5		Deviation in characteristics of Battery temperature sensor rear RH or front LH.	

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

Ⓜ With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is P33E4 or P33E5 DTC detected?

- YES >> Refer to [EVB-127. "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005836

WARNING:

- Because 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.
- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.
- Be sure to wear insulating protective gear consisting of glove, shoes and glasses/face shield before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.
- Refer to [EVB-5. "High Voltage Precautions"](#).

CAUTION:

There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.

1. PRECONDITIONING

WARNING:

Shut off high voltage circuit. Refer to [GI-31. "How to Cut Off High Voltage"](#).

1. Remove Li-ion battery. Refer to [EVB-136. "Removal and Installation"](#).
2. Remove battery pack upper case. Refer to [EVB-149. "BATTERY JUNCTION BOX : Disassembly and Assembly"](#), see Step-1 to Step-3.

>> GO TO 2.

2. CHECK BATTERY TEMPERATURE SENSOR

Refer to [EVB-128. "Component Inspection"](#).

Is the inspection result normal?

- YES >> Replace both battery temperature sensor.

P33E4, P33E5 TEMPERATURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

NO >> Replace malfunction battery temperature sensor.

Component Inspection

INFOID:000000007005837

1. CHECK BATTERY TEMPERATURE SENSOR

1. Remove battery temperature sensor. Refer to [EVB-143, "Exploded view"](#).
2. Check resistance between battery temperature sensor terminals.

Battery temperature sensor	Terminals	Condition	Resistance (k Ω)
Rear RH & Front RH	1 and 2	Temperature °C (°F)	10 (50) Approx. 7.4
Rear center & Front LH	3 and 4		25 (77) Approx. 4.0
			40 (104) Approx. 2.3

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace battery temperature sensor.

P33E6 CELL CONTROLLER

< DTC/CIRCUIT DIAGNOSIS >

P33E6 CELL CONTROLLER

DTC Logic

INFOID:000000007005838

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P33E6	CELL CONTROLLER	The maximum to minimum difference of the battery cell voltage with no load in a power on cycle exceeds the allowable cell variation range.	<ul style="list-style-type: none">Li-ion battery controllerModule

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

④ With CONSULT

- Power switch ON and wait for 10 seconds or more.
- Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
- Check DTC.

Is P33E6 detected?

- YES >> Refer to [EVB-129, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005839

1. CHECK SELF-DIAGNOSIS RESULTS OF LI-ION BATTERY CONTROLLER

④ With CONSULT

- Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
- Confirm self diagnostic result if "P3062" or "P30FD" is detected.

Is P3062 or P30FD detected?

- YES >> After replacing Li-ion battery controller, identify malfunctioning module using FFD, and perform voltage adjustment.
NO >> GO TO 2.

2. CHECK FFD

④ With CONSULT

Check FFD to identify if there is a cell voltage which largely differ from the others.

NOTE:

- If an abnormal cell is not detected, adjust the total voltage to any voltage in the table by charging or discharging.
- Check the voltage difference between maximum and minimum cells to see if the voltage difference exceeds the reference value corresponding to the total value.
- If the voltage difference exceeds the reference value, either maximum or minimum cell voltage is abnormal.

Total voltage (V)	Approx. 360	Approx. 380	Approx. 390
Max - Min voltage (mV)	230	140	135

>> Replace corresponding Module. Refer to [EVB-143, "Exploded view"](#).

P33E7 CELL CONTROLLER

< DTC/CIRCUIT DIAGNOSIS >

P33E7 CELL CONTROLLER

DTC Logic

INFOID:000000007005840

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P33E7	CELL CONTROLLER	The AD converter in Li-ion battery controller is malfunctioning.	Li-ion battery controller

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

④ With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is P33E7 detected?

- YES >> Refer to [EVB-130, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005841

When this DTC is detected, replace Li-ion battery controller. Refer to [EVB-155, "LI-ION BATTERY CONTROLLER : Disassembly and Assembly"](#).

P33ED BATTERY PARALLEL DIAGNOSIS

< DTC/CIRCUIT DIAGNOSIS >

P33ED BATTERY PARALLEL DIAGNOSIS

DTC Logic

INFOID:000000007005842

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
P33ED	Battery Parallel Diagnosis	When an abrupt voltage change for module is detected.	Module

DTC CONFIRMATION PROCEDURE

1. CHARGE/DISCHARGE OPERATION

1. Discharge absolutely Li-ion battery.
2. Charge Li-ion battery to 100% with normal charging.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

Ⓜ With CONSULT

1. Power switch ON and wait for 10 seconds or more.
2. Select "Self Diagnostic Result" mode of "HV BAT" using CONSULT.
3. Check DTC.

Is P33ED detected?

- YES >> Refer to [EVb-131, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007005843

1. CHECK DATA MONITOR OR FFD

Ⓜ With CONSULT

1. Select "DATA MONITOR" or "FFD" using CONSULT.
2. Check if there is a cell voltage which largely differ from the others.

Is there any abnormal cell?

- YES >> Replace corresponding Module. Refer to [EVb-143, "Exploded view"](#).
NO >> GO TO 2.

2. DTC CONFIRMATION PROCEDURE OPERATION

1. If abnormal cell is not identified, perform DTC confirmation procedure. Refer to [EVb-131, "DTC Logic"](#).
2. Check cell voltage again using "DATA MONITOR" or "FFD" to identify malfunctioning cell.

>> Replace corresponding Module. Refer to [EVb-143, "Exploded view"](#).

U1000 CAN COMM CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

U1000 CAN COMM CIRCUIT

Description

INFOID:000000007005844

CAN (Controller Area Network) is a serial communication line for real time applications. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Modern vehicle is equipped with many electronic control units, 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, CAN-L) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads the required data only.

CAN communication signal chart. Refer to [LAN-33, "CAN COMMUNICATION SYSTEM : CAN Communication Signal Chart"](#).

DTC Logic

INFOID:000000007005845

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U1000	CAN COMM CIRCUIT	When no CAN communication signal is received continuously for 2 seconds or more.	CAN communication system

Diagnosis Procedure

INFOID:000000007005846

For the diagnosis procedure, refer to [LAN-15, "Trouble Diagnosis Flow Chart"](#).

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

INFOID:000000007005847

WARNING:

- Because 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.
- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.
- Be sure to wear insulating protective gear consisting of glove, shoes and glasses/face shield before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.
- Refer to [EV B-5, "High Voltage Precautions"](#).

CAUTION:

There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.

1. CHECK FUSE

Check that the following fuse is not fusing.

Power supply	Fuse No.
Battery	43
Power switch ON	55
	74

Is the fuse fusing?

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

NO >> GO TO 2.

2. CHECK LI-ION BATTERY CONTROLLER GROUND CIRCUIT

1. Turn power switch OFF.
2. Disconnect Li-ion battery vehicle communication harness connector.
3. Check the continuity between Li-ion battery vehicle communication harness connector and ground.

+		-	Continuity
Li-ion battery			
Connector	Terminal	Ground	Existed
B24	6		
	7		
	8		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3. CHECK BATTERY POWER SUPPLY

Check the voltage between Li-ion battery vehicle communication harness connector and ground.

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

+		-	Voltage
Li-ion battery			
Connector	Terminal		
B24	5	Ground	12V battery power supply

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4.CHECK BATTERY POWER SUPPLY CIRCUIT

1. Check the continuity between Li-ion battery vehicle communication harness connector and fuse terminal.

+		-	Continuity
Li-ion battery			
Connector	Terminal		
B24	5	No.43 fuse terminal	Existed

2. Also check harness for short to ground.

Is the inspection result normal?

YES >> Check power supply circuit for battery power supply.

NO >> Repair or replace error-detected parts.

5.CHECK IGNITION POWER SUPPLY

1. Turn power switch ON.
2. Check the voltage between Li-ion battery vehicle communication harness and ground.

+		-	Voltage (Approx.)
Li-ion battery			
Connector	Terminal		
B24	4	Ground	11 – 14 V
	21		

Is the inspection result normal?

YES >> GO TO 8.

NO >> GO TO 6.

6.CHECK IGNITION POWER SUPPLY CIRCUIT-1

1. Turn power switch OFF.
2. Disconnect IPDM E/R harness connector.
3. Check the continuity between Li-ion battery vehicle communication harness and IPDM E/R harness connector.

Li-ion battery		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
B24	4	E15	57	Existed

4. Also check harness for short to ground.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace error-detected parts.

7.CHECK IGNITION POWER SUPPLY CIRCUIT-2

1. Check the continuity between Li-ion battery vehicle communication harness and fuse terminal.

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

Li-ion battery		—	Continuity
Connector	Terminal		
B24	21	No.74 fuse terminal	Existed

2. Also check harness for short to ground.

Is the inspection result normal?

YES >> Check power supply circuit for battery power supply.

NO >> Repair or replace error-detected parts.

8.PRECONDITIONING

WARNING:

Shut off high voltage circuit. Refer to [GI-31, "How to Cut Off High Voltage"](#).

1. Remove Li-ion battery. Refer to [EVb-136, "Removal and Installation"](#).

2. Remove battery pack upper case. Refer to [EVb-149, "BATTERY JUNCTION BOX : Disassembly and Assembly"](#), see Step-1 to Step-3.

>> GO TO 9.

9.CHECK HARNESS BETWEEN LI-ION BATTERY AND LI-ION BATTERY CONTROLLER

1. Check the continuity between Li-ion battery vehicle communication harness connector and Li-ion battery controller harness connector.

LBC		Li-ion battery		Continuity
Connector	Terminal	Connector	Terminal	
LB11	5	LB1	21	Existed
	6		4	
	21		5	
	3		8	
	15		7	
	16		6	

2. Also check harness for short to ground.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

LI-ION BATTERY

< UNIT REMOVAL AND INSTALLATION >

CAUTION:

There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.

REMOVAL

WARNING:

Perform high voltage system work preparation. Refer to [GI-31, "How to Cut Off High Voltage"](#).

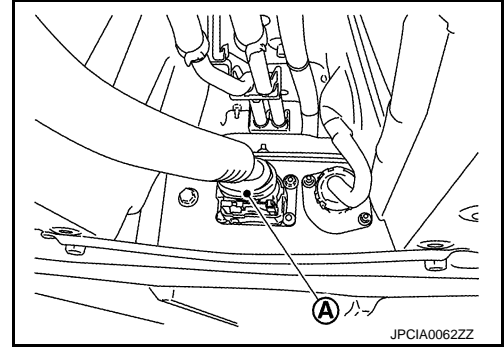
1. Lift up the vehicle and remove the battery under covers (front, center, rear).
2. Disconnect high voltage harness connector (A) from Li-ion battery.

WARNING:

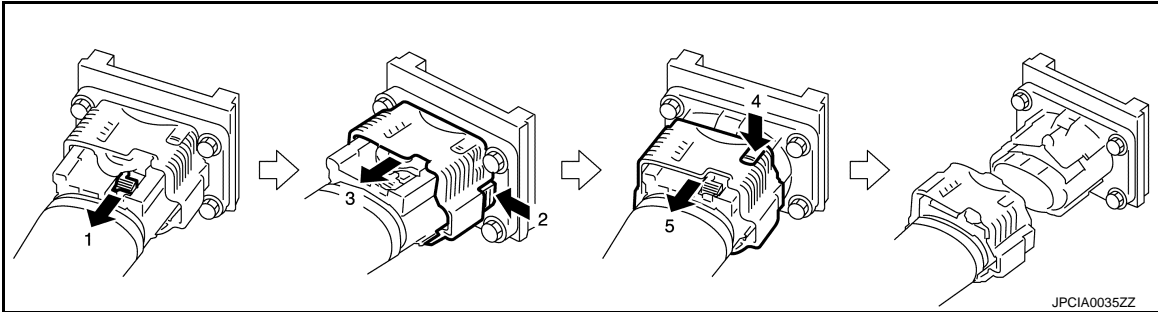
-  To prevent shock hazards, be sure to wear protective gear.



- To prevent shock hazards, immediately wrap insulating tape around disconnected high voltage connector terminals.




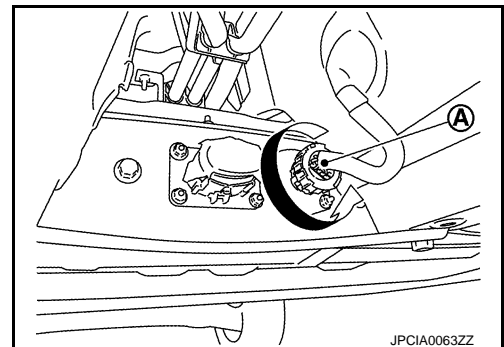
- Follow the procedure below to disconnect the high voltage harness connector.



3. Disconnect the Li-ion battery vehicle communication harness connector (A) while turning it counterclockwise.

WARNING:


-  To prevent shock hazards, be sure to wear protective gear.

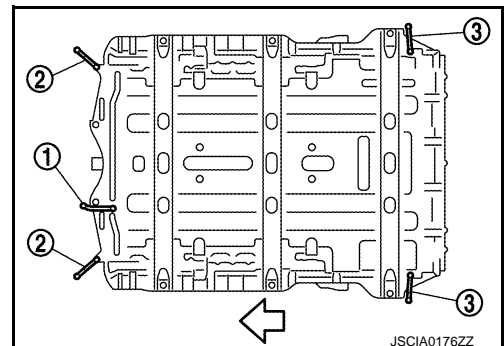


4. Remove the bonding plates.

- 1. : Stamp No.2
- 2. : Stamp No.4
- 3. : Stamp No.6
- ← : Vehicle front

WARNING:

-  To prevent shock hazards, be sure to wear protective gear.



LI-ION BATTERY

< UNIT REMOVAL AND INSTALLATION >

NOTE:

The bonding plate shape differs depending on the location of installation.

- Remove the Li-ion battery mounting bolts (A).

← : Vehicle front

WARNING:

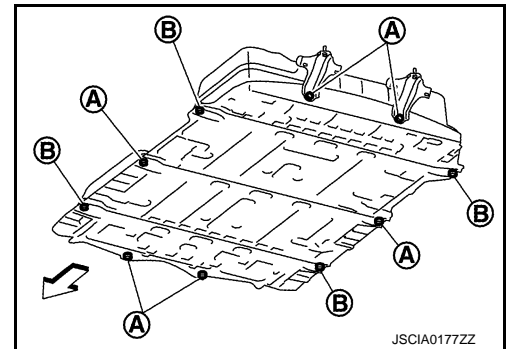


To prevent shock hazards, be sure to wear protective gear.



CAUTION:

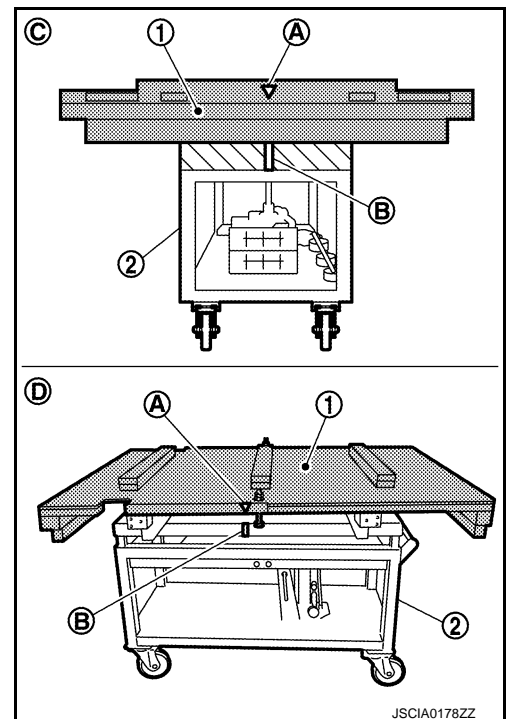
Never remove the 4 bolts (B) shown in the figure.



- Set the pallet onto the lifter table.
 - Align center mark (A) of pallet (1) with center mark (B) of battery lift table (2).

C. : Front

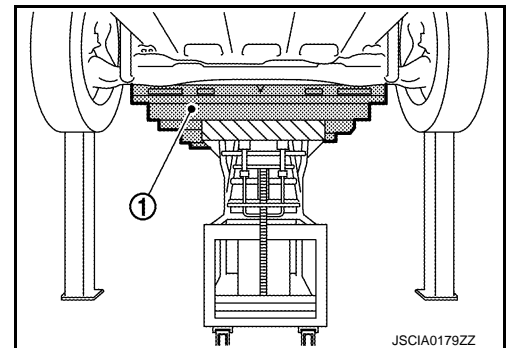
D. : Side



- Set the pallet (1) onto the Li-ion battery.

CAUTION:

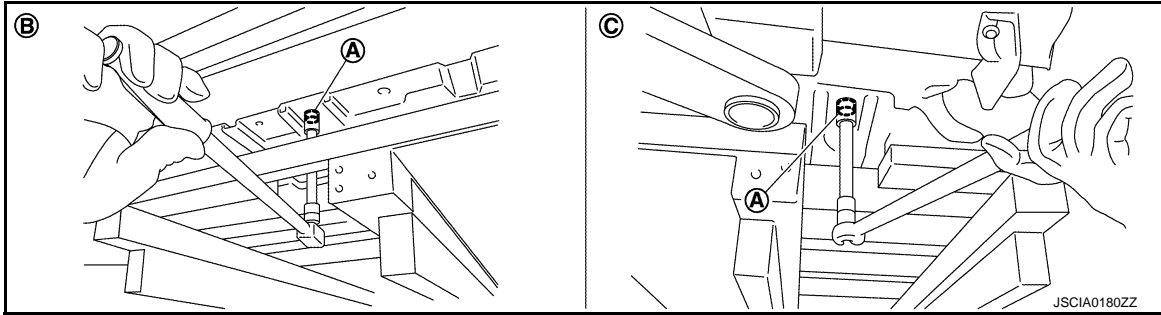
Set the palette and Li-ion battery with transportation fixing bolts.



- Remove the Li-ion battery mounting bolts (4 bolts).

LI-ION BATTERY

< UNIT REMOVAL AND INSTALLATION >



B. : Front

C. : Rear

WARNING:



To prevent shock hazards, be sure to wear protective gear.

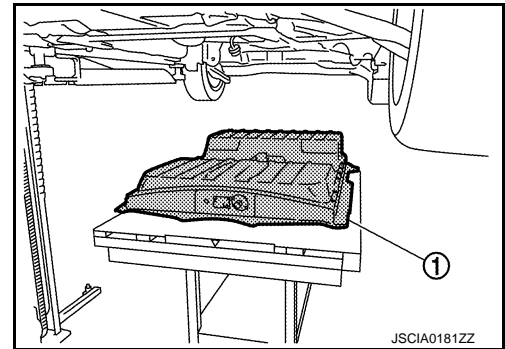


9. Lower the pallet and remove the Li-ion battery (1) from the vehicle.

WARNING:

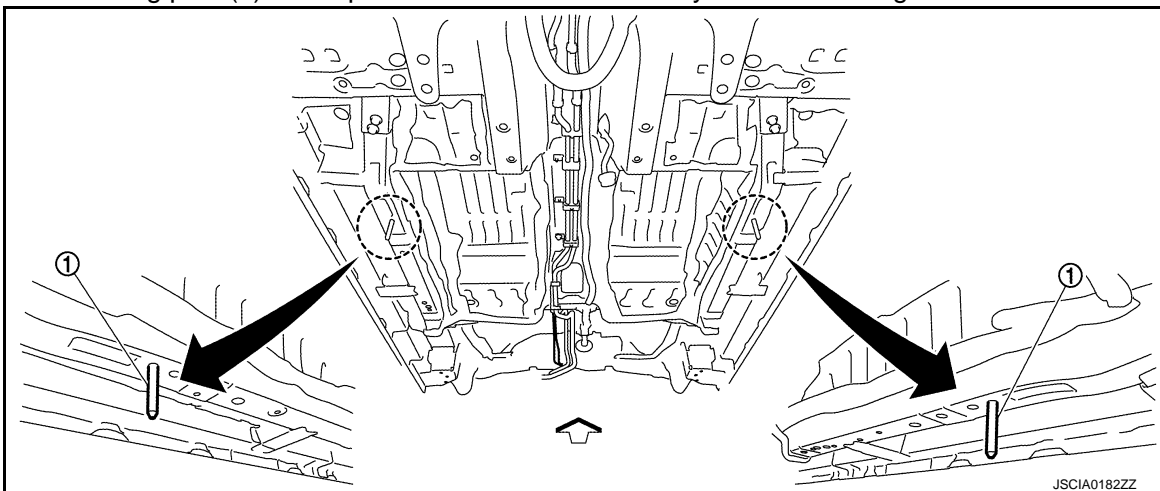


To prevent shock hazards, be sure to wear protective gear.



INSTALLATION

1. When replacing the Li-ion battery with a new one, perform the following procedure.
 - a. Enter the date of replacement on the EV battery traceability seal packaged with the new part.
 - b. Cut the EV battery traceability seal in two and affix each seal to the Li-ion battery and "Li-ion BATTERY REPLACEMENT RECORD".
 - c. Fill in the "Li-ion BATTERY REPLACEMENT RECORD".
2. Install 2 locating pins (1) at the positions on the vehicle body shown in the figure.



: Vehicle front

3. Install the Li-ion battery onto the vehicle body.

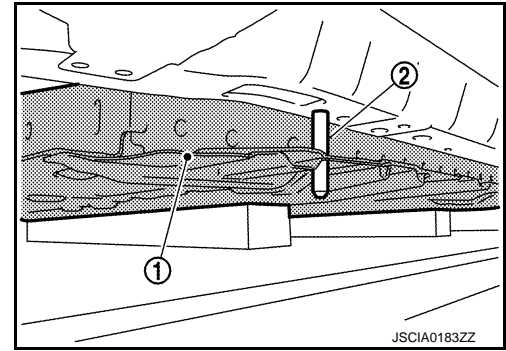
LI-ION BATTERY

< UNIT REMOVAL AND INSTALLATION >

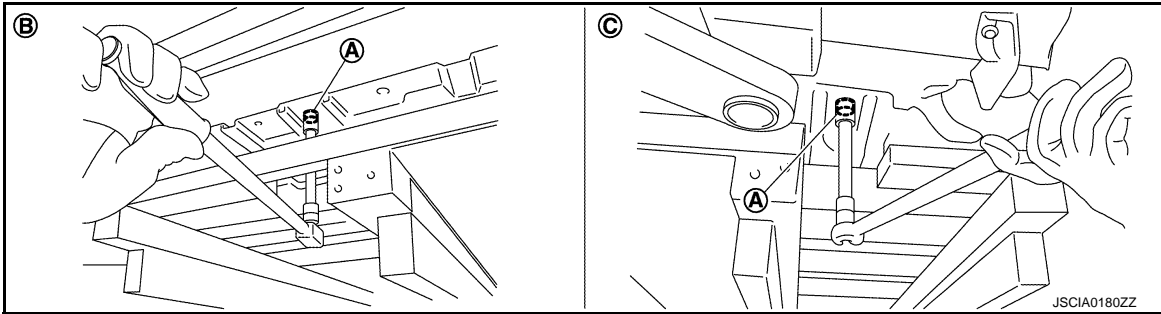
- Align the Li-ion battery (1) and the locating pin (2).

WARNING:

 To prevent shock hazards, be sure to wear protective gear.




- Tighten mounting bolts (4 bolts) (A) and remove pallet from Li-ion battery.



B. : Front

C. : Rear

WARNING:

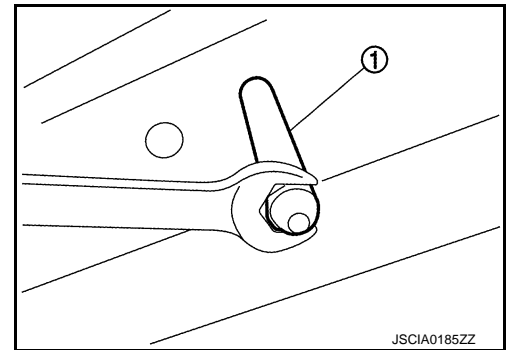
 To prevent shock hazards, be sure to wear protective gear.



- Remove the locating pins from the body.
 - If the locating pins (1) are tight and cannot be removed, use a spanner to remove them.

WARNING:

 To prevent shock hazards, be sure to wear protective gear.




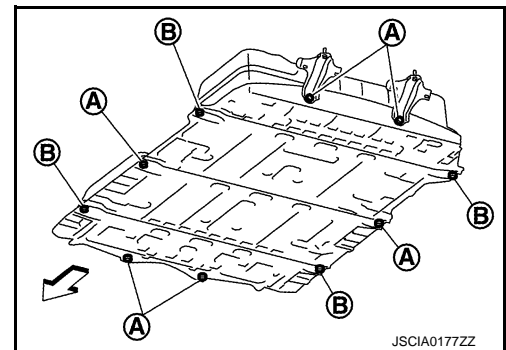
- Install the Li-ion battery mounting bolts (A).



: Vehicle front

WARNING:

 To prevent shock hazards, be sure to wear protective gear.



LI-ION BATTERY

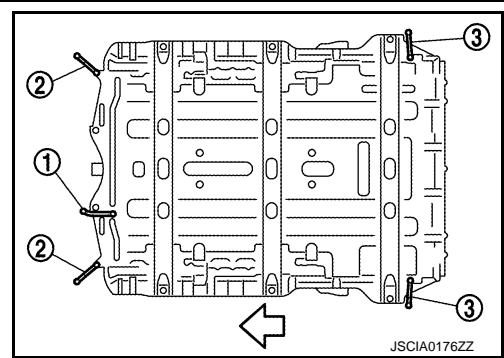
< UNIT REMOVAL AND INSTALLATION >

7. Check the stamp No. of the bonding plate, and install it at the position shown in the figure.

- 1. : Stamp2
- 2. : Stamp4
- 3. : Stamp6
- ← : Vehicle front

WARNING:


 To prevent shock hazards, be sure to wear protective gear.

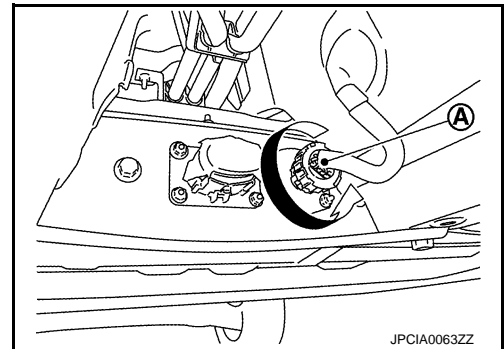


A
B
EVB

8. After installing the bonding plate, check the equipotential. Refer to [EVB-141, "Inspection"](#).
9. Turn the vehicle communication harness connector (A) clockwise to install.

WARNING:


 To prevent shock hazards, be sure to wear protective gear.

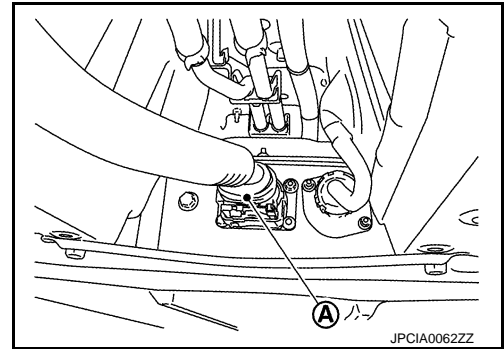


D
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F
G
H
I

10. Install the high voltage harness connector (A).

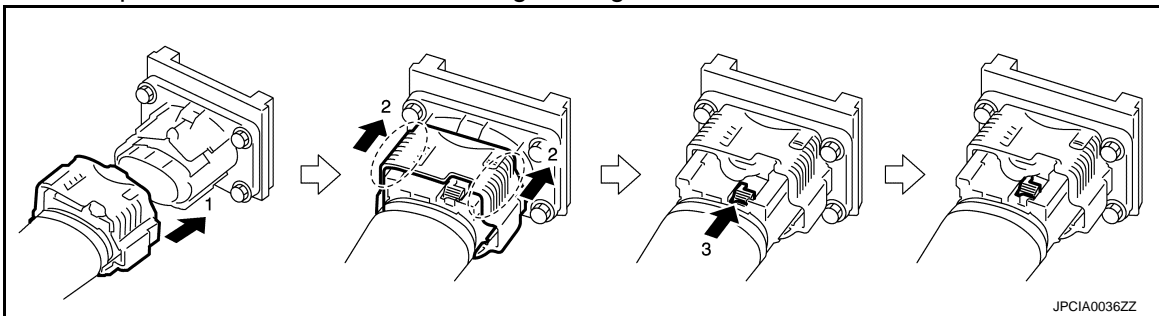
WARNING:

 To prevent shock hazards, be sure to wear protective gear.



J
K
L

- Follow the procedure below to install the high voltage harness connector.



M
N
O
P

11. Install the under covers (front, center, rear).
12. Install the service plug. Refer to [GI-31, "How to Cut Off High Voltage"](#).

Inspection

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EQUIPOTENTIAL TEST

LI-ION BATTERY

< UNIT REMOVAL AND INSTALLATION >

After installing the Li-ion battery, measure the resistance between the body of the battery pack (A) and the vehicle body (B).

WARNING:



To prevent shock hazards, be sure to wear protective gear.



Standard : 0.1 Ω or less

If the result deviates from the standard values, perform the below inspection and correct the abnormal location.

- Connection conditions of bonding plates
- Corrosion on bonding plate mounting surfaces
- Paint, oil, dust, or other substance on bonding plate mounting surfaces

LI-ION BATTERY

< UNIT DISASSEMBLY AND ASSEMBLY >

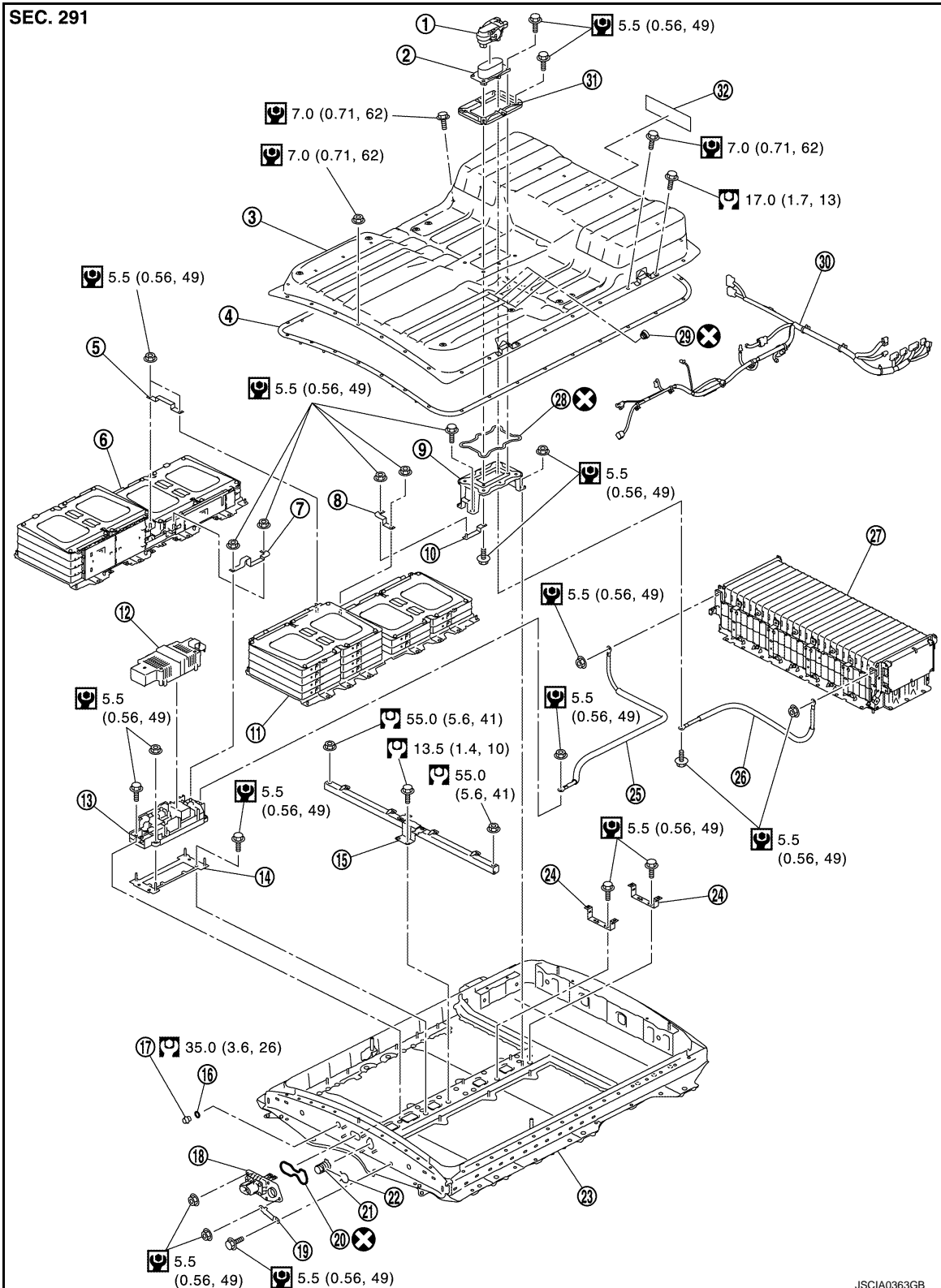
UNIT DISASSEMBLY AND ASSEMBLY

LI-ION BATTERY

Exploded view

INFOID:000000007005851

LI-ION BATTERY



A
B
C
D
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K
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M
N
O
P

EVB

LI-ION BATTERY

< UNIT DISASSEMBLY AND ASSEMBLY >

- | | | |
|--------------------------|----------------------------------|---|
| 1. Service plug | 2. Service plug switch | 3. Battery pack upper case |
| 4. Seal | 5. Bus bar | 6. Front module stack RH |
| 7. Bus bar | 8. Bus bar | 9. Service plug switch bracket |
| 10. Bus bar | 11. Front module stack LH | 12. Battery junction box cover |
| 13. Battery junction box | 14. Battery junction box bracket | 15. Battery member pipe |
| 16. Drain plug washer | 17. Drain plug | 18. High voltage harness connector |
| 19. Bonding plate | 20. Seal | 21. Vehicle communication harness connector |
| 22. Snap ring | 23. Battery pack lower case | 24. Harness bracket |
| 25. High voltage harness | 26. High voltage harness | 27. Rear module stack |
| 28. Seal | 29. Breather | 30. Vehicle communication harness |
| 31. Retainer | 32. High voltage warning label | |

⊗ : Always replace every disassembly

⊙ : N·m (kg-m, in-lb)

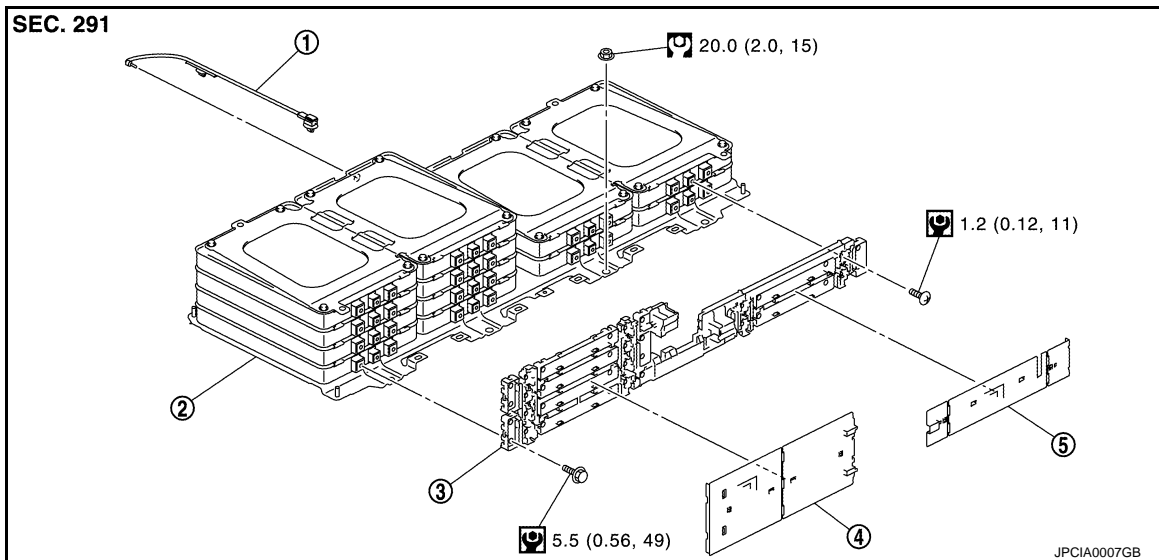
⊙ : N·m (kg-m, ft-lb)

FRONT MODULE STACK

Removal

NOTE:

Figure indicates front RH.



- | | | |
|--|-----------------------|------------|
| 1. Battery temperature sensor (RH front) | 2. Front module stack | 3. Bus bar |
| 4. Bus bar cover | 5. Bus bar cover | |

⊙ : N·m (kg-m, in-lb)

⊙ : N·m (kg-m, ft-lb)

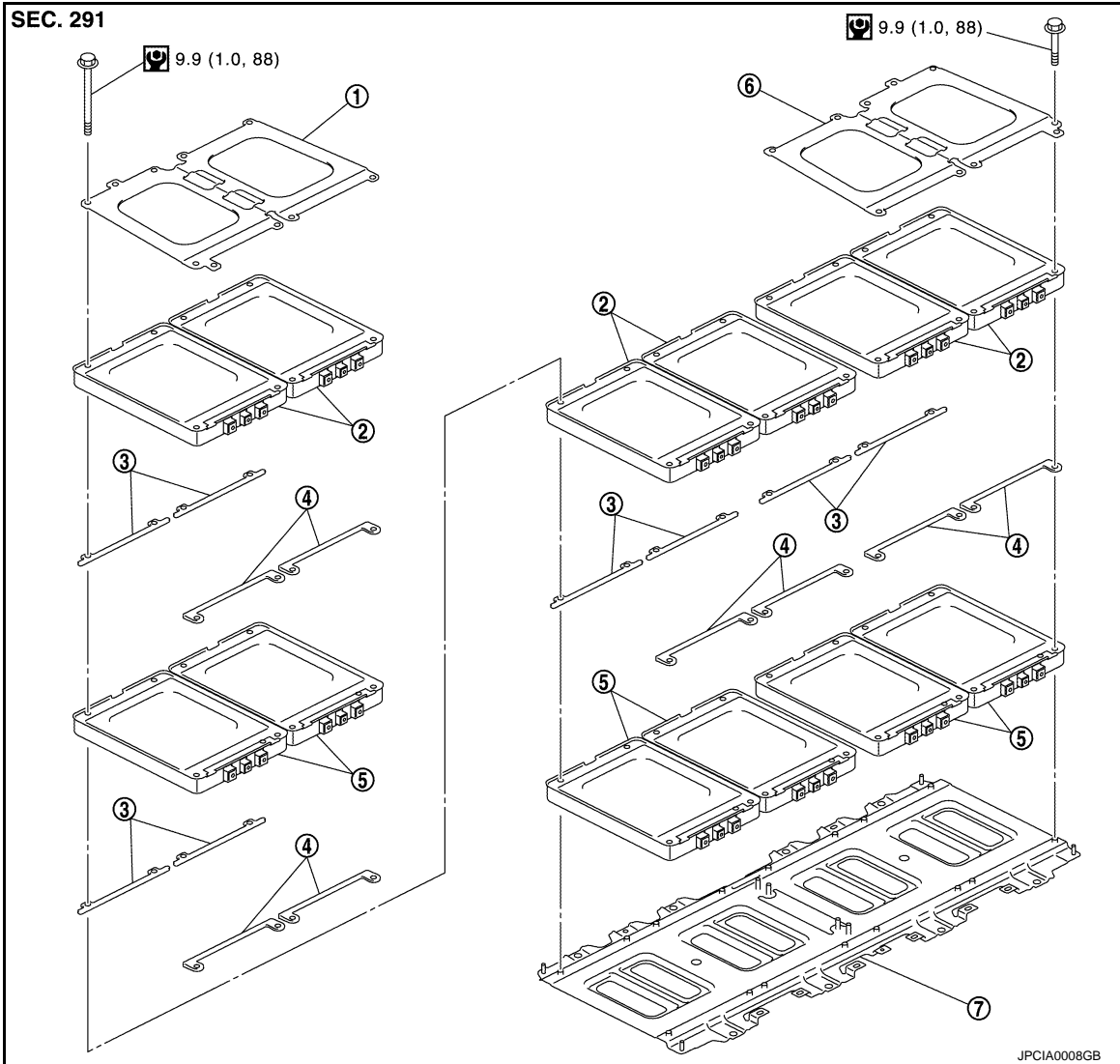
Disassembly

NOTE:

Figure indicates front RH.

LI-ION BATTERY

< UNIT DISASSEMBLY AND ASSEMBLY >



- | | | |
|---------------------------|-------------|-----------------------|
| 1. End plate (front) | 2. Module B | 3. Spacer (back side) |
| 4. Spacer (terminal side) | 5. Module A | 6. End plate (rear) |
| 7. Sub flame | | |

: N·m (kg·m, in·lb)

A

B

EVB

D

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F

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J

K

L

M

N

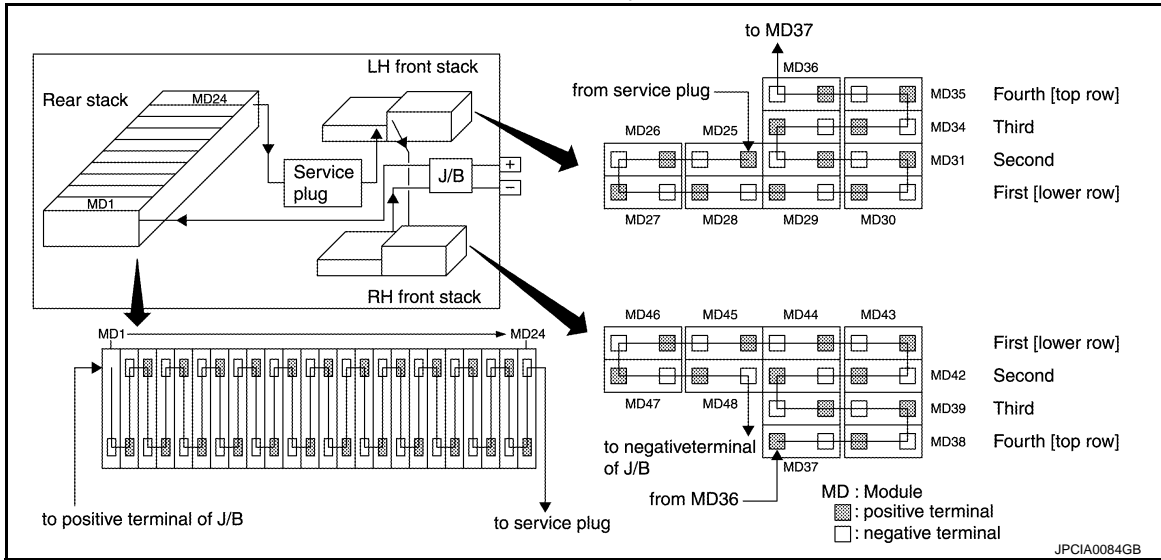
O

P

LI-ION BATTERY

< UNIT DISASSEMBLY AND ASSEMBLY >

Module Layout



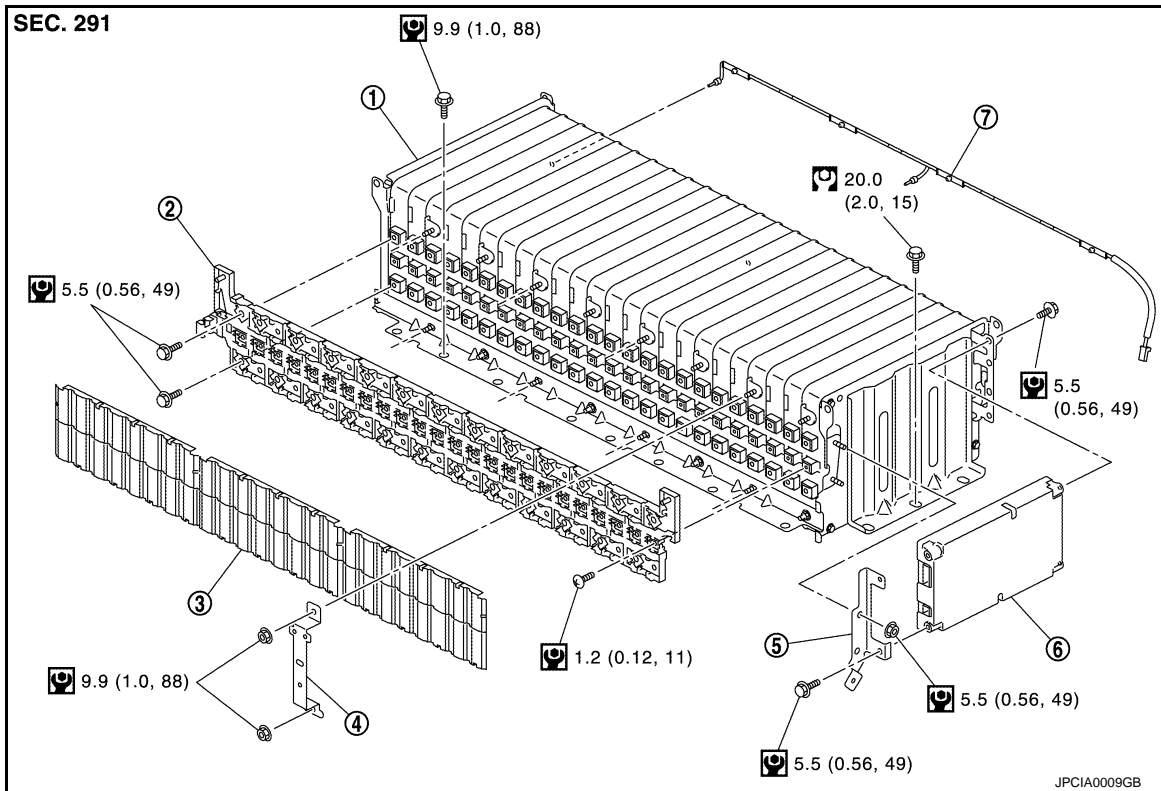
LH front module stack			RH front module stack		
Module No.	Module name	Cell No.	Module No.	Module name	Cell No.
MD25	Module B	49 & 50	MD37	Module B	73 & 74
MD26	Module B	51 & 52	MD38	Module B	75 & 76
MD27	Module A	53 & 54	MD39	Module A	77 & 78
MD28	Module A	55 & 56	MD40	Module A	79 & 80
MD29	Module A	57 & 58	MD41	Module B	81 & 82
MD30	Module A	59 & 60	MD42	Module B	83 & 84
MD31	Module B	61 & 62	MD43	Module A	85 & 86
MD32	Module B	63 & 64	MD44	Module A	87 & 88
MD33	Module A	65 & 66	MD45	Module A	89 & 90
MD34	Module A	67 & 68	MD46	Module A	91 & 92
MD35	Module B	69 & 70	MD47	Module B	93 & 94
MD36	Module B	71 & 72	MD48	Module B	95 & 96

REAR MODULE STACK

Removal

LI-ION BATTERY

< UNIT DISASSEMBLY AND ASSEMBLY >



- | | | |
|--------------------------------------|--------------------|------------------------------|
| 1. Rear module stack | 2. Bus bar | 3. Bus bar cover |
| 4. Harness bracket | 5. Control bracket | 6. Li-ion battery controller |
| 7. Battery temperature sensor (rear) | | |

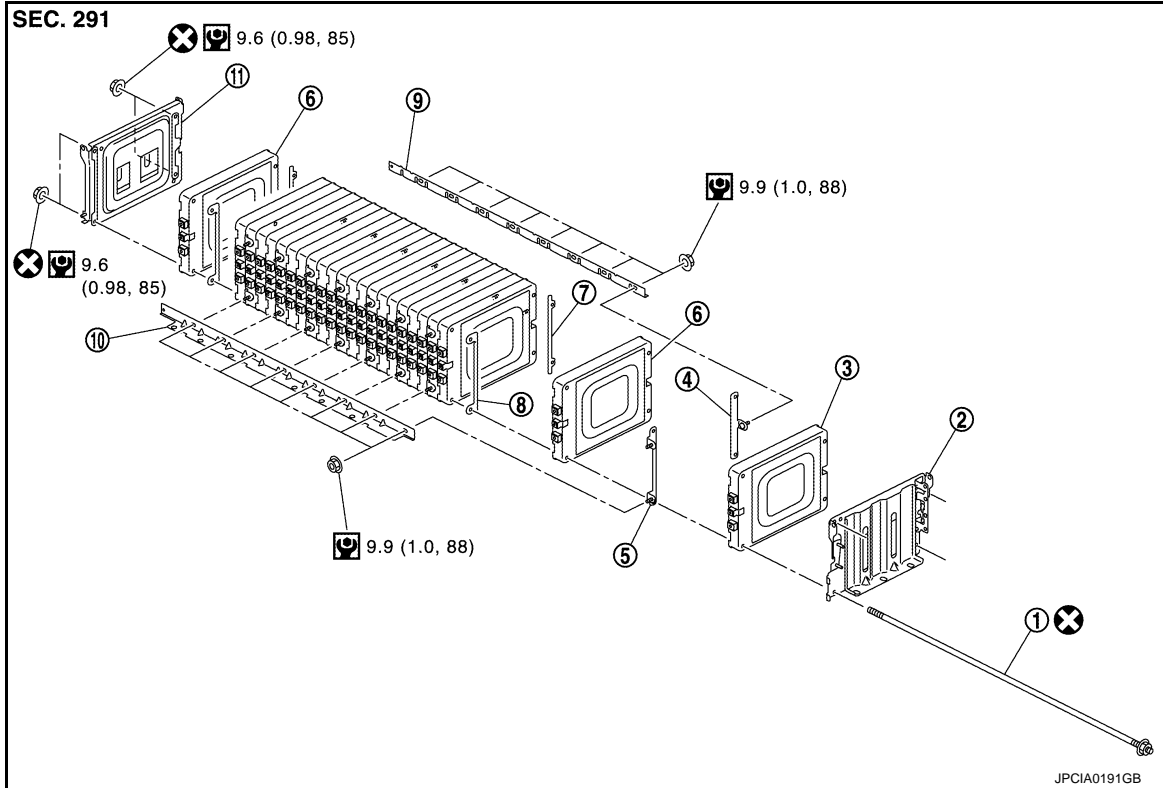
: N·m (kg·m, in·lb)

Disassembly

A
B
EVB
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LI-ION BATTERY

< UNIT DISASSEMBLY AND ASSEMBLY >

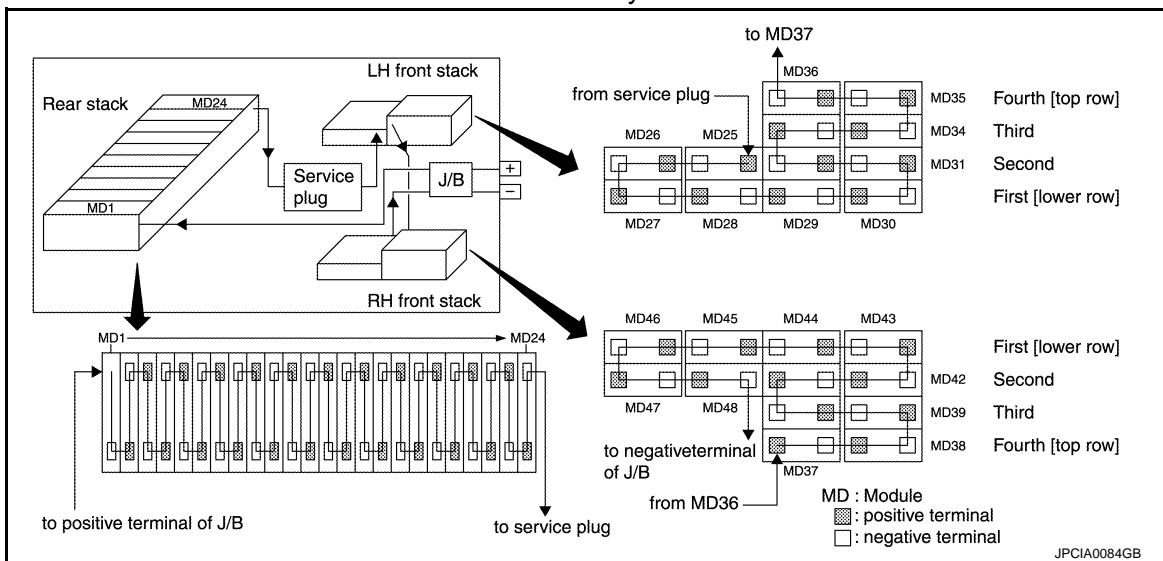


- | | | |
|-------------------------------|-----------------------------------|----------------------|
| 1. Through bolt | 2. LH end plate | 3. Module A |
| 4. Mounting plate (back side) | 5. Mounting plate (terminal side) | 6. Module B |
| 7. Support plate (back side) | 8. Support plate (terminal side) | 9. Rear stack member |
| 10. Front stack member | 11. RH end plate | |

⊗ : Always replace every disassembly

⊙ : N·m (kg·m, in·lb)

Module Layout



LI-ION BATTERY

< UNIT DISASSEMBLY AND ASSEMBLY >

Rear module stack					
Module No.	Module name	Cell No.	Module No.	Module name	Cell No.
MD1	Module B	1 & 2	MD13	Module B	25 & 26
MD2	Module A	3 & 4	MD14	Module A	27 & 28
MD3	Module B	5 & 6	MD15	Module B	29 & 30
MD4	Module A	7 & 8	MD16	Module A	31 & 32
MD5	Module B	9 & 10	MD17	Module B	33 & 34
MD6	Module A	11 & 12	MD18	Module A	35 & 36
MD7	Module B	13 & 14	MD19	Module B	37 & 38
MD8	Module A	15 & 16	MD20	Module A	39 & 40
MD9	Module B	17 & 18	MD21	Module B	41 & 42
MD10	Module A	19 & 20	MD22	Module A	43 & 44
MD11	Module B	21 & 22	MD23	Module B	45 & 46
MD12	Module A	23 & 24	MD24	Module A	47 & 48

BATTERY JUNCTION BOX

BATTERY JUNCTION BOX : Disassembly and Assembly

INFOID:000000007005852

WARNING:

- Because 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.
- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.
- Be sure to wear insulating protective equipment before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.
- Refer to [EVB-5, "High Voltage Precautions"](#).

CAUTION:

There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.

WORK ENVIRONMENT FOR DISASSEMBLY OF LI-ION BATTERY

1. Must be an indoor environment.
 - The work environment must be able to be isolated from the outside by shutters or other means to prevent the intrusion of rain, snow, sand, and other substances.
 - The environment must prevent the entry of sweat during work, and also prevent condensation from occurring as a result of high temperature and humidity.
2. No entry of foreign materials.
 - In addition to being indoors, the environment must not permit the entry during disassembly work of metal powders, oil, or foreign substances resulting from causes such as servicing of other vehicles.
 - If there is any risk of the above, use a plastic curtain or other means to block off the work area, or take other necessary steps.
3. The floor must be dry.
 - The floor must not become wet as a result of causes such as vehicles entering when it is raining or snowing.
4. Work space
 - Space approximately the size of one vehicle must be secured as the disassembly space.

LI-ION BATTERY

< UNIT DISASSEMBLY AND ASSEMBLY >

- A sign indicating that disassembly is in progress or other measures must be taken so that persons other than the workers do not enter the work space.

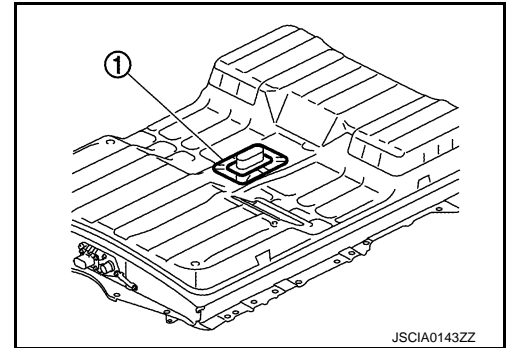
DISASSEMBLY

1. Clean any contamination and dust from the battery pack.
2. Remove service plug retainer (1).

WARNING:

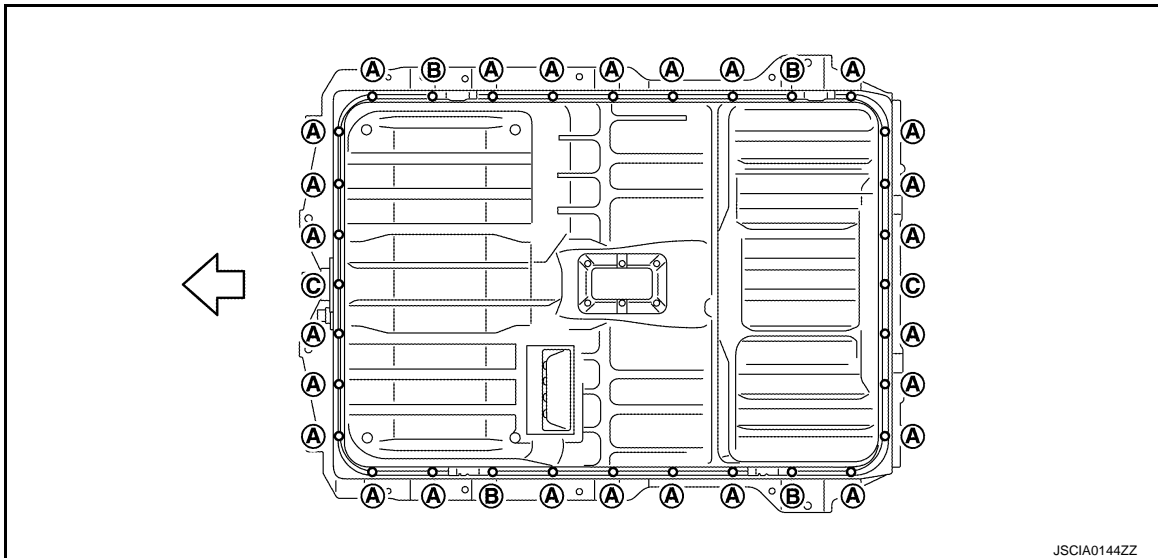


To prevent shock hazards, be sure to wear protective gear.



JSCIA0143ZZ

3. Remove mounting bolts (A), (B) and mounting nuts (C), then remove battery pack upper case.



JSCIA0144ZZ

← : Vehicle front

WARNING:



To prevent shock hazards, be sure to wear protective gear.



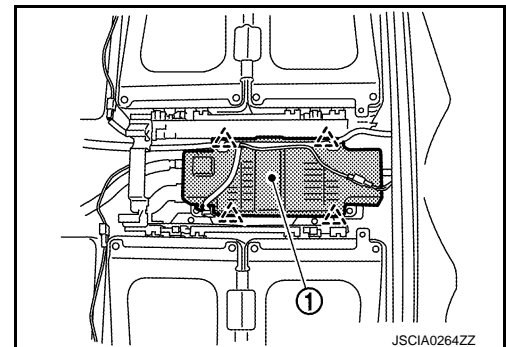
4. Disengage pawls and remove battery junction box cover (1).

△ : Pawl

WARNING:



To prevent shock hazards, be sure to put on insulated protective gear and use insulated tools.



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LI-ION BATTERY

< UNIT DISASSEMBLY AND ASSEMBLY >

5. Remove terminal mounting nut (A) of high voltage harness connector.

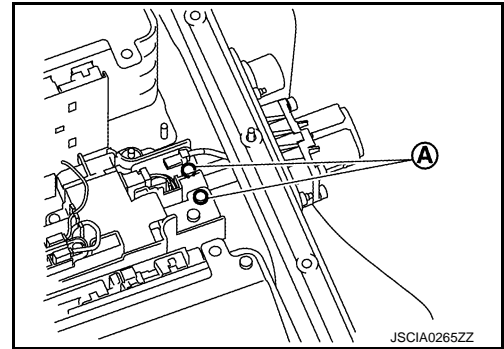
DANGER:

 Touching high voltage components with using the appropriate protective equipment will cause electrocution.



WARNING:

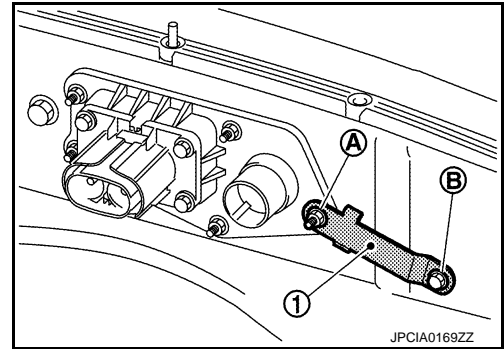
To prevent shock hazards, immediately wrap insulating tape around disconnected high voltage connector terminals.



6. Remove mounting nut (A) and mounting bolt (B), then remove bonding plate (1).

WARNING:

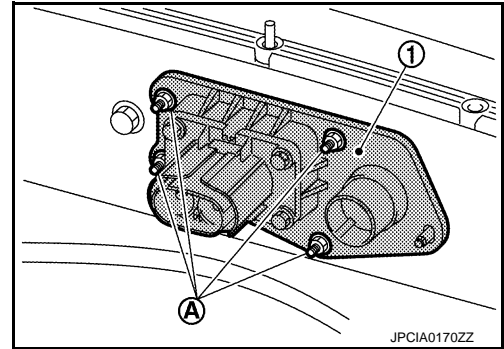
 To prevent shock hazards, be sure to put on insulated protective gear and use insulated tools.



7. Remove mounting nuts (A), then disconnect high voltage harness connector (1) from battery pack.

WARNING:

 To prevent shock hazards, be sure to put on insulated protective gear and use insulated tools.



8. Remove mounting nuts (A), then remove high voltage harness (1) and bus bar (2) from battery junction box.

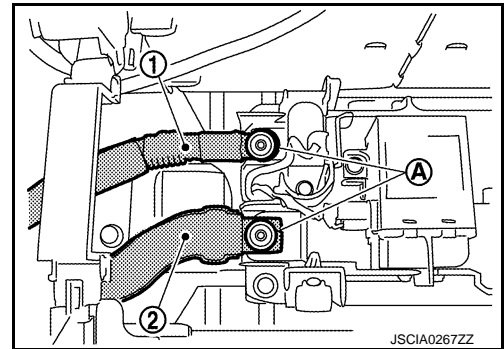
DANGER:

 Touching high voltage components with using the appropriate protective equipment will cause electrocution.



WARNING:

To prevent shock hazards, immediately wrap insulating tape around disconnected high voltage connector terminals.



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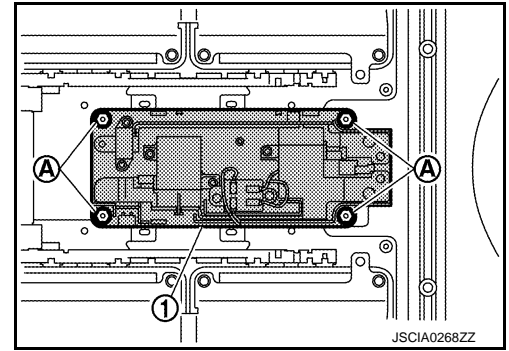
LI-ION BATTERY

< UNIT DISASSEMBLY AND ASSEMBLY >

- Remove mounting nut (A) and remove battery junction box (1).

WARNING:

 To prevent shock hazards, be sure to put on insulated protective gear and use insulated tools.

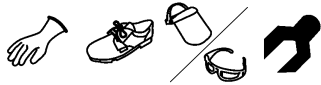


ASSEMBLY

- Install battery junction box.

WARNING:

 To prevent shock hazards, be sure to put on insulated protective gear and use insulated tools.



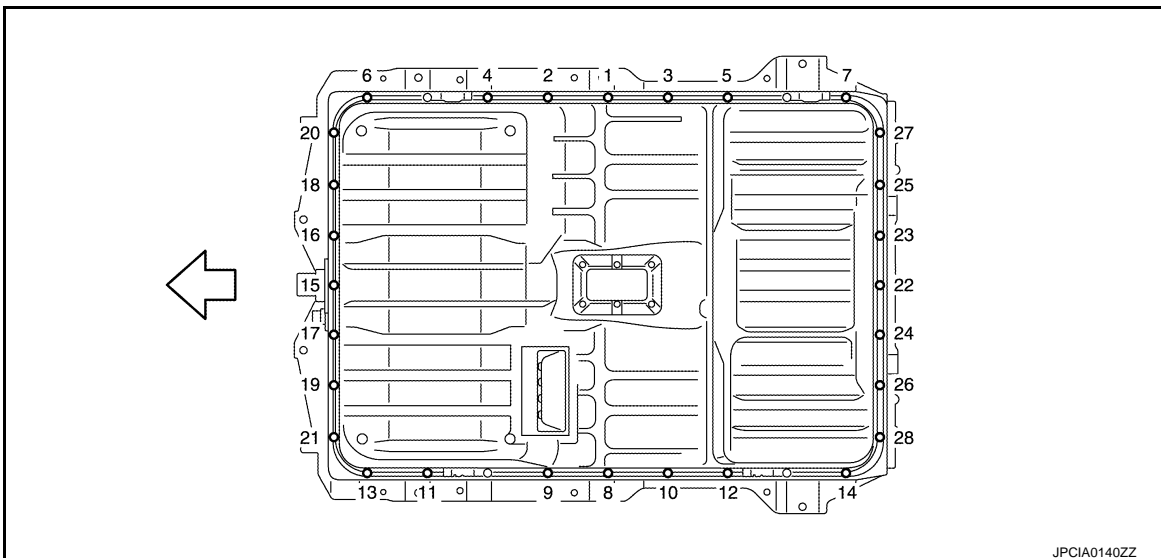
- Install high voltage harness connector.

WARNING:

 To prevent shock hazards, be sure to put on insulated protective gear and use insulated tools.



- Follow the procedure below and install battery pack upper case.
 - Tighten mounting nuts and bolts in numerical order as shown in the figure.



 : Vehicle front

WARNING:

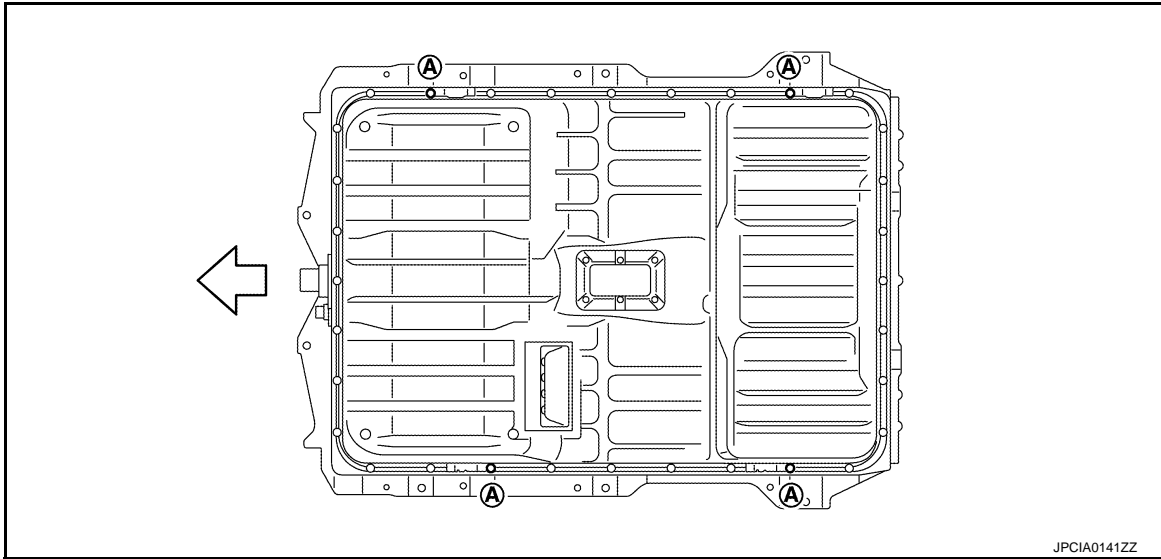
 To prevent shock hazards, be sure to wear protective gear.



LI-ION BATTERY

< UNIT DISASSEMBLY AND ASSEMBLY >

- b. Install ground bolt (A).



← : Vehicle front

WARNING:



To prevent shock hazards, be sure to wear protective gear.



4. Install service plug retainer.

WARNING:



To prevent shock hazards, be sure to wear protective gear.



CAUTION:

- Perform the “LI-ION BATTERY JUNCTION BOX DATA CLEAR” when battery junction box is replaced. Refer to [EVC-104, "Work Procedure"](#).
- Check the following items after installing battery pack: Refer to [EVB-153, "BATTERY JUNCTION BOX : Inspection"](#).
 - AIRTIGHTNESS TEST
 - ELECTRIC EQUIPOTENTIAL TEST

BATTERY JUNCTION BOX : Inspection

INFOID:000000007005853

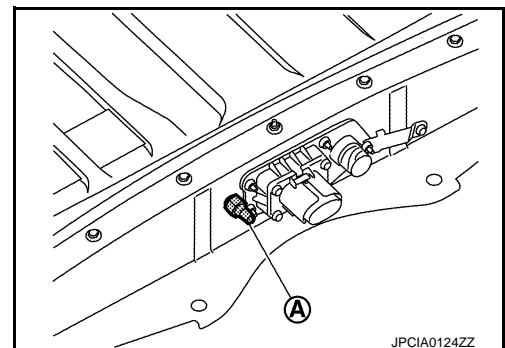
AIR TIGHTNESS INSPECTION

1. Remove drain plug and install chuck [SST: KV99111400] (A).

WARNING:



To prevent shock hazards, be sure to wear protective gear.



LI-ION BATTERY

< UNIT DISASSEMBLY AND ASSEMBLY >

2. Install gauge [SST: KV99111400] (A).

WARNING:

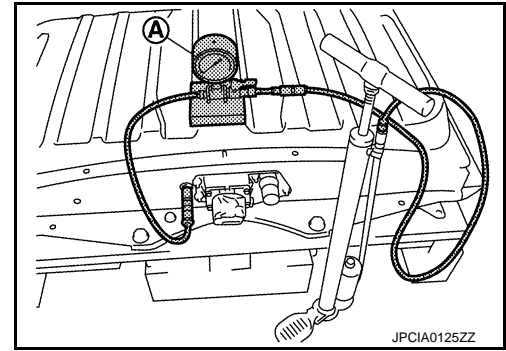


To prevent shock hazards, be sure to wear protective gear.



CAUTION:

Handle the gauge carefully so that it will not drop.

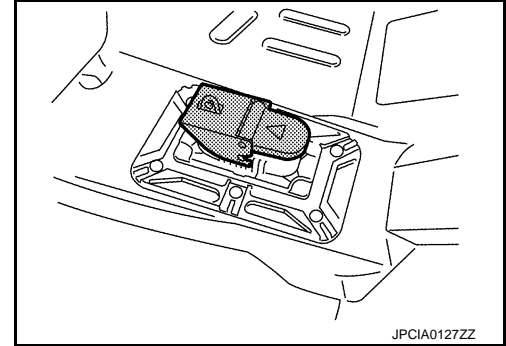


3. Install service lock out plug or service plug.

DANGER:



Touching high voltage components with using the appropriate protective equipment will cause electrocution.

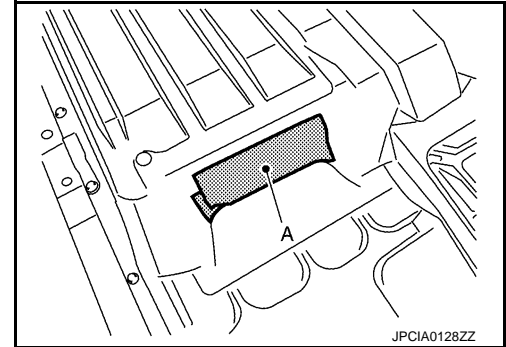


4. Use vinyl tape (A) or similar means to seal the breather so that air does not enter it.

WARNING:



To prevent shock hazards, be sure to wear protective gear.



5. Perform airtightness test by applying 1.6 kPa (0.016 bar, 0.0163 kg/cm², 0.23 psi) of pressure inside the battery pack for approximately 1 minute.

CAUTION:

- When applying pressure, operate the air pump slowly.
- Do not apply any pressure exceeding 1.6 kPa (0.02 bar, 0.0163 kg/cm², 0.29 psi).

Repair limit : 1.4 kPa (0.02 bar, 0.0204 kg/cm², 0.29 psi)

6. If the pressure rises above the limit value, use soapy water and check for leakage points.

WARNING:



To prevent shock hazards, be sure to wear protective gear.



CAUTION:

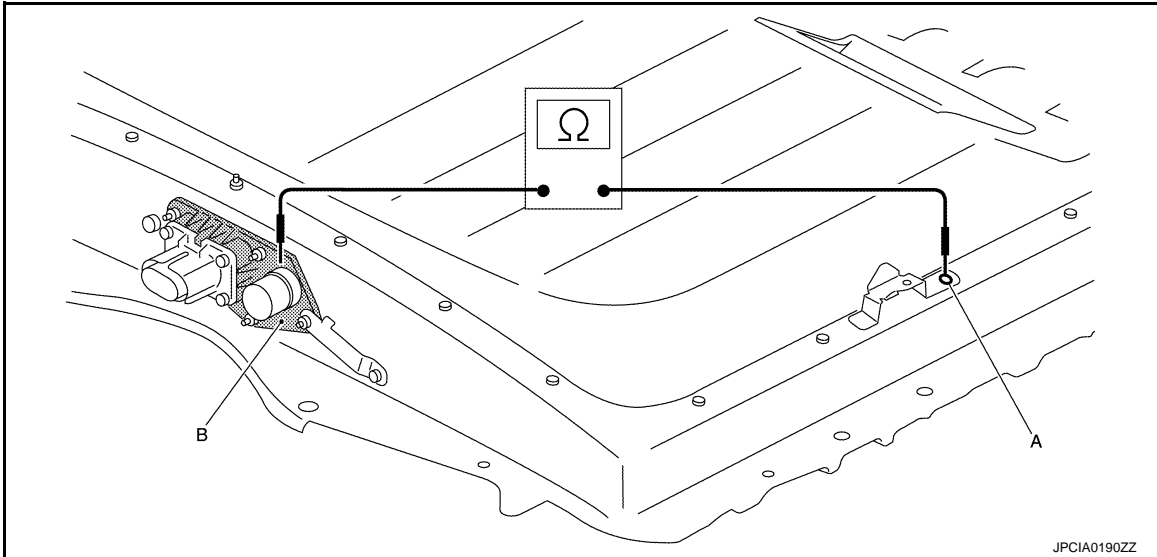
Never allow soapy water to contact the service plug.

Electric Equipotential Test

LI-ION BATTERY

< UNIT DISASSEMBLY AND ASSEMBLY >

After installing the battery pack, measure the resistance between the ground bolt mating surface (A) and the high voltage harness connector flange (B).



WARNING:



To prevent shock hazards, be sure to wear protective gear.



Standard : 0.1 Ω or less

If the result deviates from the standard value, check the following items and repair malfunctioning parts

- Connection condition of ground bolts
- Rust on the mounting surface of ground bolts
- Paint, oil, and dust on the mounting surface of ground bolts

LI-ION BATTERY CONTROLLER

LI-ION BATTERY CONTROLLER : Disassembly and Assembly

INFOID:000000007005854

WARNING:

- Because hybrid vehicles and electric vehicles contain a high voltage battery, there is the risk of electric shock, electric leakage, or similar accidents if the vehicle is handled incorrectly. Be sure to follow the correct work procedures when performing inspection and maintenance.
- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.
- Be sure to wear insulating protective equipment before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them. Refer to
- [EV5-5, "High Voltage Precautions"](#).

CAUTION:

There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.

WORK ENVIRONMENT FOR DISASSEMBLY OF LI-ION BATTERY

1. Must be an indoor environment.
 - The work environment must be able to be isolated from the outside by shutters or other means to prevent the intrusion of rain, snow, sand, and other substances.
 - The environment must prevent the entry of sweat during work, and also prevent condensation from occurring as a result of high temperature and humidity.

LI-ION BATTERY

< UNIT DISASSEMBLY AND ASSEMBLY >

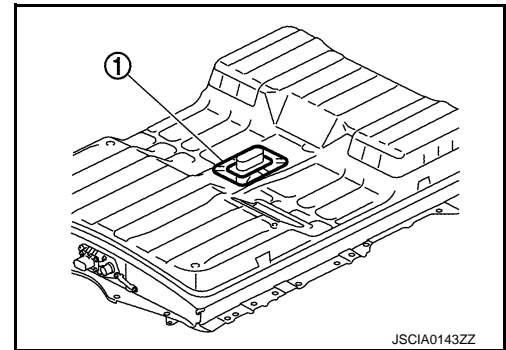
- No entry of foreign materials.
 - In addition to being indoors, the environment must not permit the entry during disassembly work of metal powders, oil, or foreign substances resulting from causes such as servicing of other vehicles.
 - If there is any risk of the above, use a plastic curtain or other means to block off the work area, or take other necessary steps.
- The floor must be dry.
 - The floor must not become wet as a result of causes such as vehicles entering when it is raining or snowing.
- Work space
 - Space approximately the size of one vehicle must be secured as the disassembly space.
 - A sign indicating that disassembly is in progress or other measures must be taken so that persons other than the workers do not enter the work space.

DISASSEMBLY

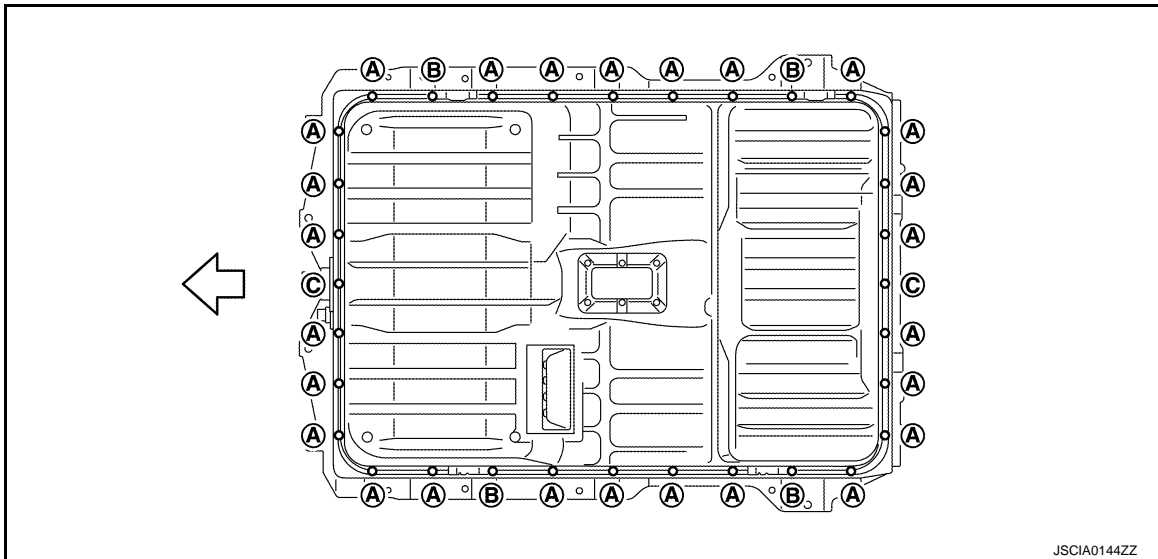
- Remove Li-ion battery. Refer to [EVB-136. "Removal and Installation"](#).
- Remove service plug retainer (1).

WARNING:

 To prevent shock hazards, be sure to wear protective gear.



- Remove mounting bolts (A), (B) and mounting nuts (C), then remove battery pack upper case.



← : Vehicle front

WARNING:

 To prevent shock hazards, be sure to wear protective gear.



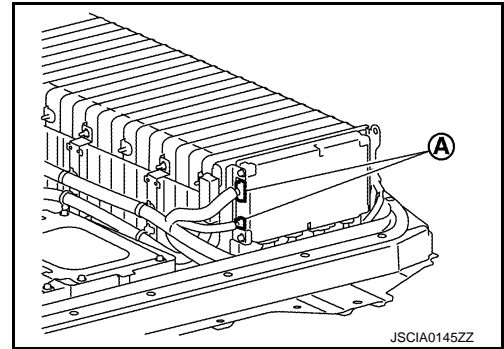
LI-ION BATTERY

< UNIT DISASSEMBLY AND ASSEMBLY >

4. Disconnect Li-ion battery controller harness connector (A).

WARNING:

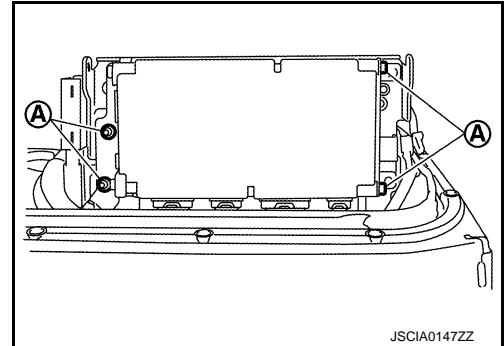
 To prevent shock hazards, be sure to wear protective gear.



5. Remove Li-ion battery controller mounting bolts (A).


WARNING:

 To prevent shock hazards, be sure to put on insulated protective gear and use insulated tools.



6. Remove harness connector and harness clip, then remove Li-ion battery controller.

WARNING:

 To prevent shock hazards, be sure to wear protective gear.



• To prevent shock hazards, immediately wrap insulating tape around disconnected high voltage connector terminals.

NOTE:

Remove together with controller bracket.

ASSEMBLY

Assemble in the reverse order of disassembly.

1. Install Li-ion battery controller.

WARNING:

 To prevent shock hazards, be sure to put on insulated protective gear and use insulated tools.

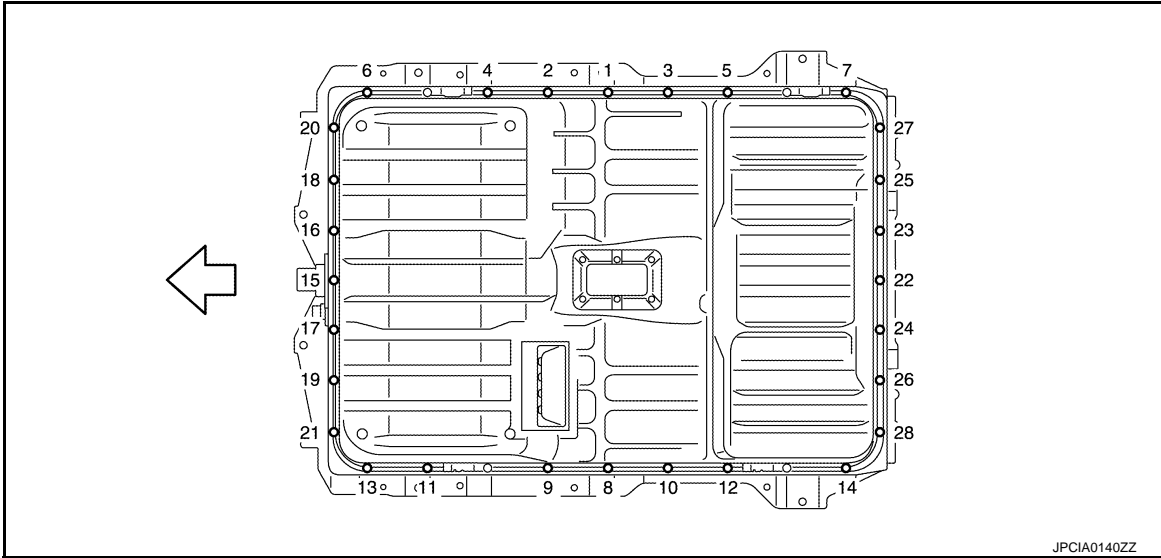


2. Follow the procedure below and install battery pack upper case.
 - a. Tighten mounting nuts and bolts in numerical order as shown in the figure.

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LI-ION BATTERY

< UNIT DISASSEMBLY AND ASSEMBLY >



← : Vehicle front

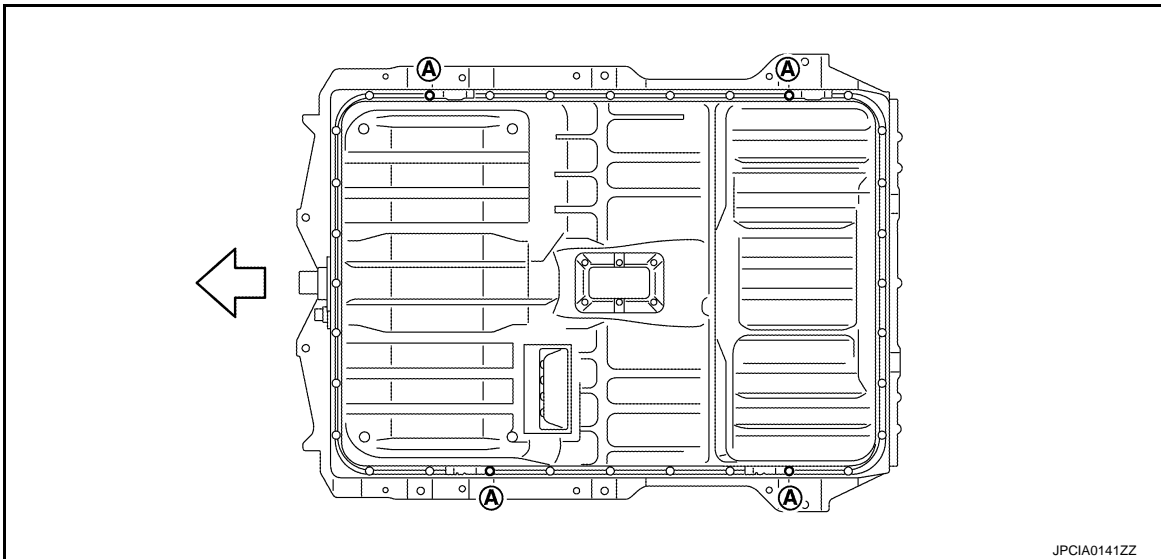
WARNING:



To prevent shock hazards, be sure to wear protective gear.



b. Install ground bolt (A).



← : Vehicle front

WARNING:



To prevent shock hazards, be sure to wear protective gear.



3. Install service plug retainer.

WARNING:

LI-ION BATTERY

< UNIT DISASSEMBLY AND ASSEMBLY >



To prevent shock hazards, be sure to wear protective gear.



CAUTION:

- Perform the “ADDITIONAL SERVICE WHEN REPLACING LI-ION BATTERY CONTROLLER” when Li-ion battery controller is replaced. Refer to [EVB-55, "Work Procedure"](#).
- Check the following items after installing battery pack: Refer to [EVB-159, "LI-ION BATTERY CONTROLLER : Inspection"](#).

■AIRTIGHTNESS TEST

■ELECTRIC EQUIPOTENTIAL TEST

LI-ION BATTERY CONTROLLER : Inspection

INFOID:000000007063698

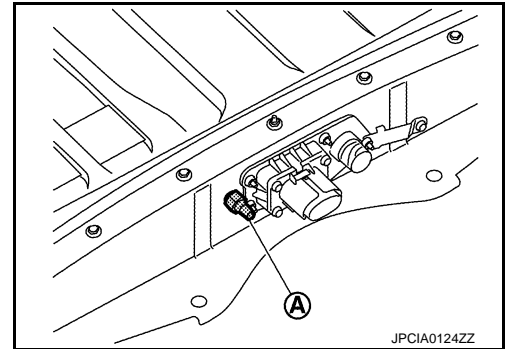
AIR TIGHTNESS INSPECTION

1. Remove drain plug and install chuck [SST: KV99111400] (A).

WARNING:



To prevent shock hazards, be sure to wear protective gear.



2. Install gauge [SST: KV99111400] (A).

WARNING:

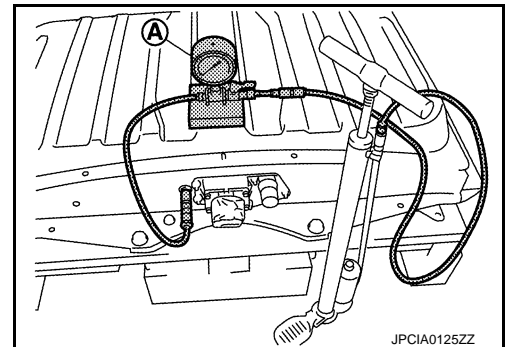


To prevent shock hazards, be sure to wear protective gear.



CAUTION:

Handle the gauge carefully so that it will not drop.

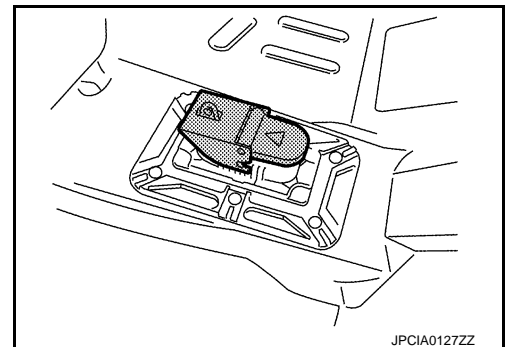


3. Install service lock out plug or service plug.

DANGER:



Touching high voltage components with using the appropriate protective equipment will cause electrocution.



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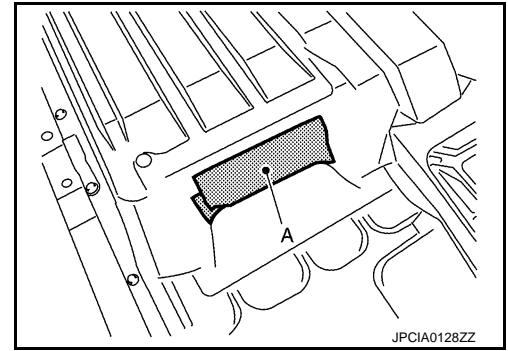
LI-ION BATTERY

< UNIT DISASSEMBLY AND ASSEMBLY >

4. Use vinyl tape (A) or similar means to seal the breather so that air does not enter it.

WARNING:

 To prevent shock hazards, be sure to wear protective gear.



5. Perform airtightness test by applying 1.6 kPa (0.016 bar, 0.0163 kg/cm², 0.23 psi) of pressure inside the battery pack for approximately 1 minute.

CAUTION:

- When applying pressure, operate the air pump slowly.
- Do not apply any pressure exceeding 1.6 kPa (0.02 bar, 0.0163 kg/cm², 0.29 psi).

Repair limit : 1.4 kPa (0.02 bar, 0.0204 kg/cm², 0.29 psi)

6. If the pressure rises above the limit value, use soapy water and check for leakage points.

WARNING:

 To prevent shock hazards, be sure to wear protective gear.

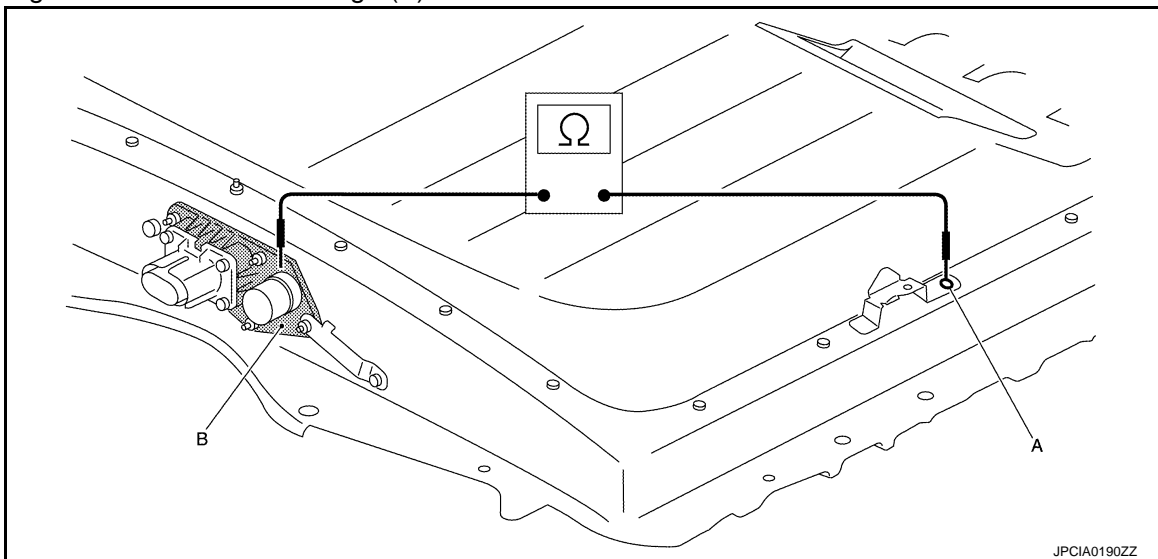


CAUTION:

Never allow soapy water to contact the service plug.

Electric Equipotential Test

After installing the battery pack, measure the resistance between the ground bolt mating surface (A) and the high voltage harness connector flange (B).



WARNING:

 To prevent shock hazards, be sure to wear protective gear.



Standard : 0.1 Ω or less

LI-ION BATTERY

< UNIT DISASSEMBLY AND ASSEMBLY >

If the result deviates from the standard value, check the following items and repair malfunctioning parts

- Connection condition of ground bolts
- Rust on the mounting surface of ground bolts
- Paint, oil, and dust on the mounting surface of ground bolts

FRONT MODULE STACK

FRONT MODULE STACK : Disassembly and Assembly

INFOID:000000007005856

WARNING:

- Because 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.
- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.
- Be sure to wear insulating protective equipment before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.
- Refer to [EVB-5, "High Voltage Precautions"](#).

CAUTION:

There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.

WORK ENVIRONMENT FOR DISASSEMBLY OF LI-ION BATTERY

1. Must be an indoor environment.
 - The work environment must be able to be isolated from the outside by shutters or other means to prevent the intrusion of rain, snow, sand, and other substances.
 - The environment must prevent the entry of sweat during work, and also prevent condensation from occurring as a result of high temperature and humidity.
2. No entry of foreign materials.
 - In addition to being indoors, the environment must not permit the entry during disassembly work of metal powders, oil, or foreign substances resulting from causes such as servicing of other vehicles.
 - If there is any risk of the above, use a plastic curtain or other means to block off the work area, or take other necessary steps.
3. The floor must be dry.
 - The floor must not become wet as a result of causes such as vehicles entering when it is raining or snowing.
4. Work space
 - Space approximately the size of one vehicle must be secured as the disassembly space.
 - A sign indicating that disassembly is in progress or other measures must be taken so that persons other than the workers do not enter the work space.

DISASSEMBLY

1. Remove battery junction box. Refer to [EVB-155, "LI-ION BATTERY CONTROLLER : Disassembly and Assembly"](#).

LI-ION BATTERY

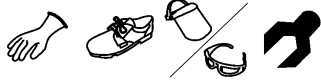
< UNIT DISASSEMBLY AND ASSEMBLY >

2. Remove bus bar (1) that connects service plug switch and left front module stack.

DANGER:

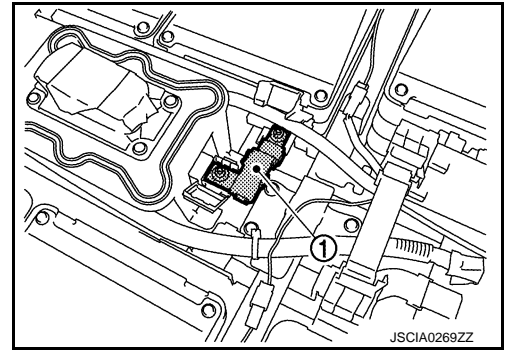


Touching high voltage components with using the appropriate protective equipment will cause electrocution.



WARNING:

After removing, close bus bar cover.

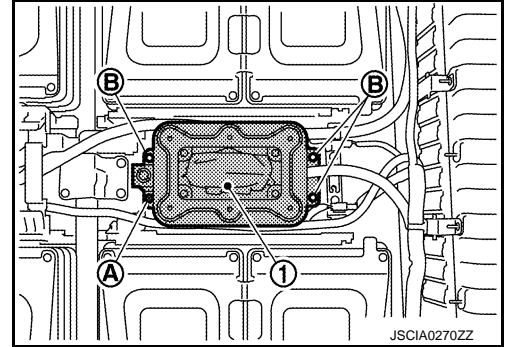


3. Remove mounting bolts (A) and nuts (B) of service plug switch bracket (1).

WARNING:



To prevent shock hazards, be sure to put on insulated protective gear and use insulated tools.

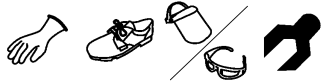


4. Disconnect high voltage harness (A) and connector (B) on reverse side of service plug switch bracket (1), then remove service plug switch bracket (1).

DANGER:

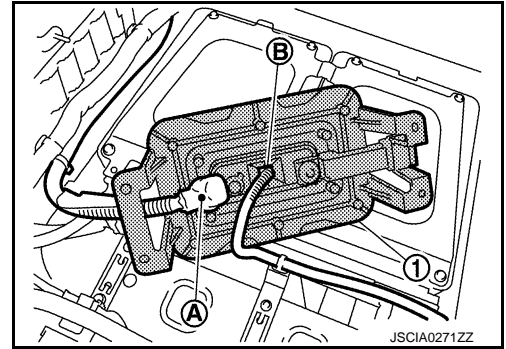


Touching high voltage components with using the appropriate protective equipment will cause electrocution.



WARNING:

To prevent shock hazards, immediately wrap insulating tape around disconnected high voltage connector terminals.

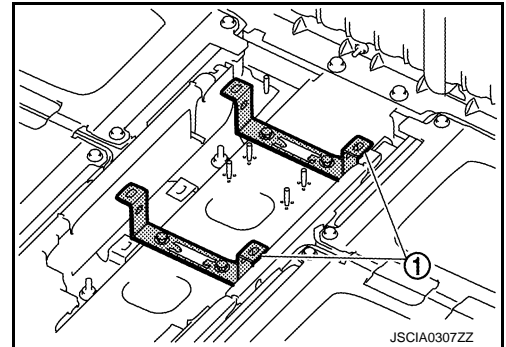
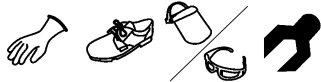


5. Remove harness bracket (1).

WARNING:




To prevent shock hazards, be sure to put on insulated protective gear and use insulated tools.



LI-ION BATTERY

< UNIT DISASSEMBLY AND ASSEMBLY >

6. Remove bus bar (1) that connects left and right front module stacks.

 : Vehicle front

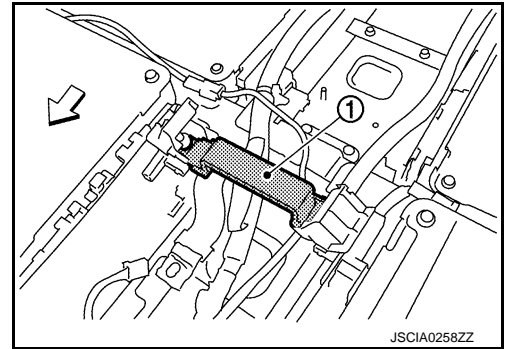
DANGER:

 Touching high voltage components with using the appropriate protective equipment will cause electrocution.

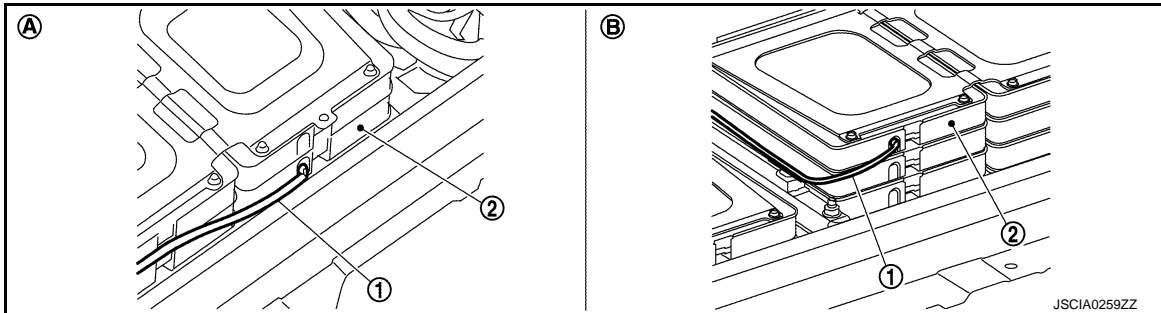


WARNING:

To prevent shock hazards, immediately wrap insulating tape around disconnected high voltage connector terminals.



7. Remove battery temperature sensor (1) from module (2).



A. : Front module LH

B. : Front module RH

WARNING:

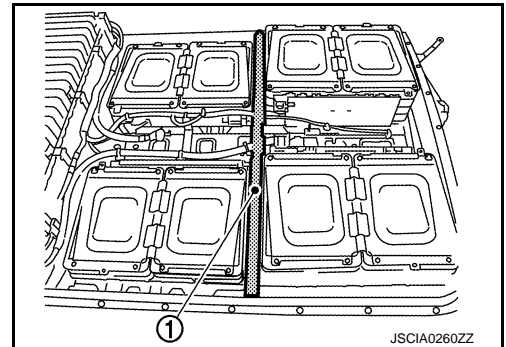
 To prevent shock hazards, be sure to put on insulated protective gear and use insulated tools.



8. Remove battery member pipe (1).

WARNING:

 To prevent shock hazards, be sure to put on insulated protective gear and use insulated tools.



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LI-ION BATTERY

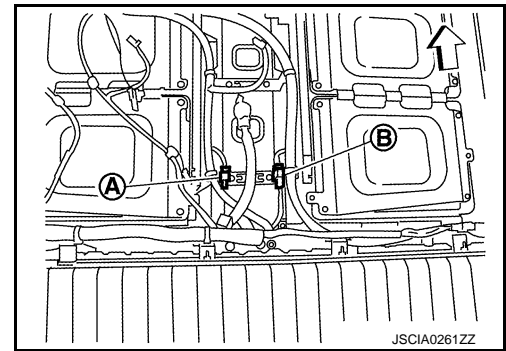
< UNIT DISASSEMBLY AND ASSEMBLY >

9. Remove vehicle communication harness connector.

- A. : Front module LH
- B. : Front module RH
- ← : Vehicle front

WARNING:

 To prevent shock hazards, be sure to wear protective gear.

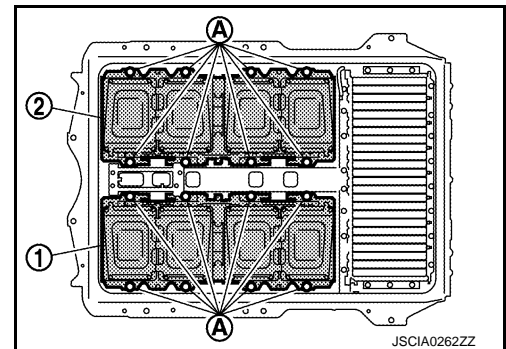


10. Remove front module stack mounting bolts (A).

- 1. : Front module LH
- 2. : Front module RH

WARNING:

 To prevent shock hazards, be sure to put on insulated protective gear and use insulated tools.



11. Place front module stack (1) onto work bench.

WARNING:

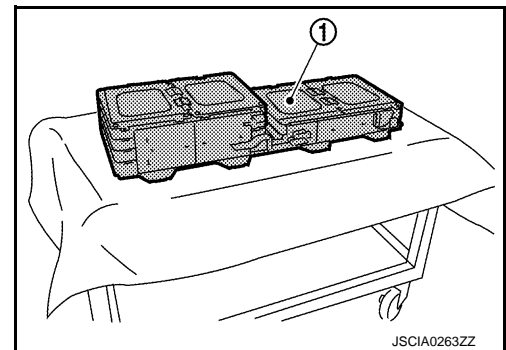
-  To prevent shock hazards, be sure to wear protective gear.



- Be sure to place an insulating rubber sheet on the work bench.

NOTE:

Figure indicates front RH.



12. Follow the procedure below and remove bus bar from front module stack.

a. Remove bus bar (1).

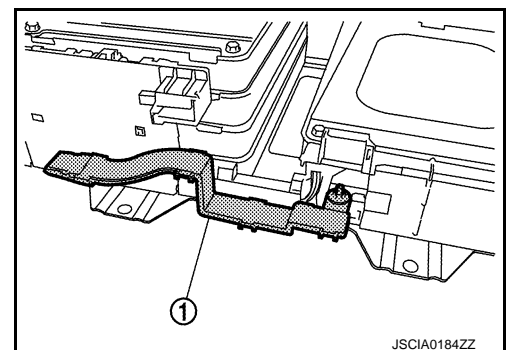
DANGER:

 Touching high voltage components with using the appropriate protective equipment will cause electrocution.



WARNING:

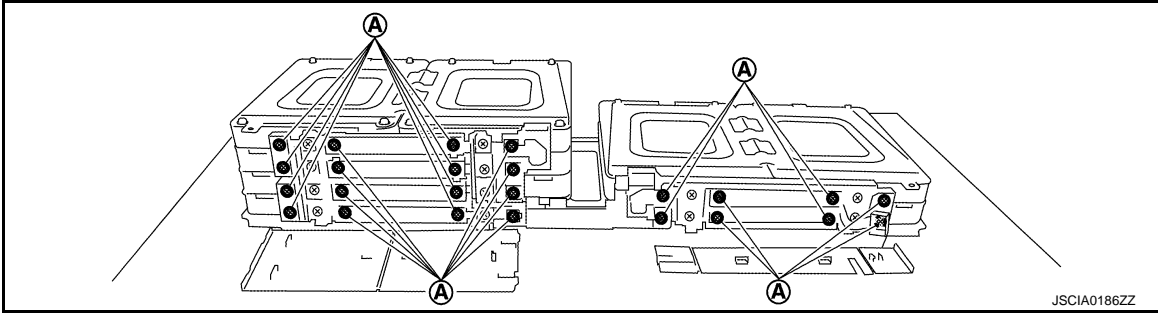
To prevent shock hazards, immediately wrap insulating tape around disconnected high voltage connector terminals.




LI-ION BATTERY

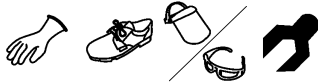
< UNIT DISASSEMBLY AND ASSEMBLY >

b. Remove bus bar cover and remove module terminal mounting bolts (A).



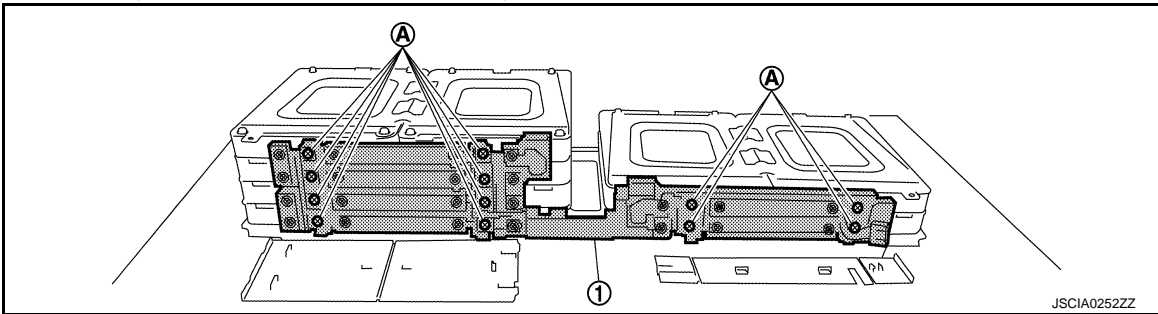
DANGER:

-  Touching high voltage components with using the appropriate protective equipment will cause electrocution.



-  Work alone. Failure to do this may cause shock hazards.

c. Remove voltage detection terminal mounting screws (A) and remove bus bar (1) from front module stack.



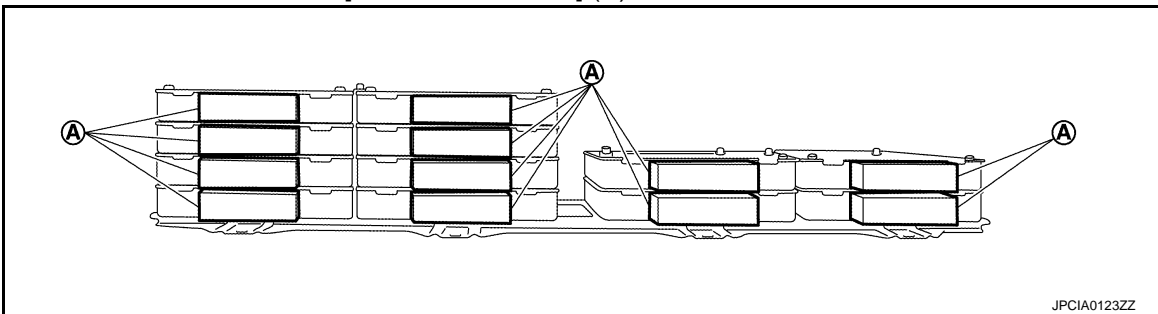
DANGER:

-  Touching high voltage components with using the appropriate protective equipment will cause electrocution.



-  Work alone. Failure to do this may cause shock hazards.

d. Attach module terminal covers [SST: KV99111500] (A) to all module terminals.



WARNING:

-  To prevent shock hazards, be sure to wear protective gear.



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LI-ION BATTERY

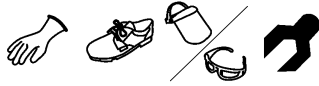
< UNIT DISASSEMBLY AND ASSEMBLY >

13. Remove end plate and disassembly front module stack.

WARNING:



To prevent shock hazards, be sure to put on insulated protective gear and use insulated tools.



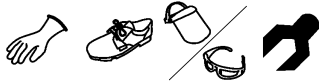
ASSEMBLY

Note the following, assemble in the reverse order of disassembly.

WARNING:



To prevent shock hazards, be sure to put on insulated protective gear and use insulated tools.



CAUTION:

- Perform the “MODULE CHARGE BALANCE” when module is replaced. Refer to [EVB-56, "Work Procedure"](#).

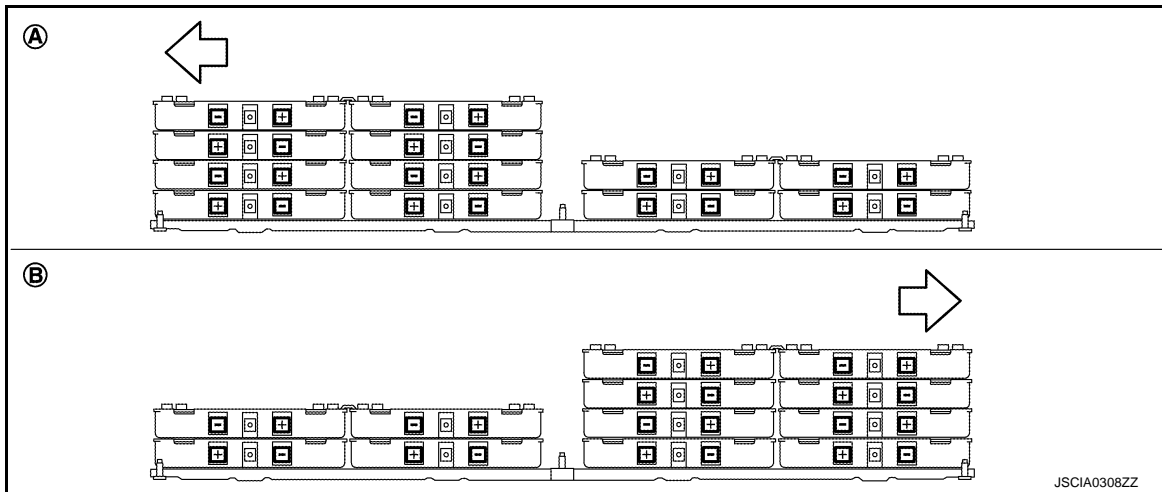
EV Battery Traceability Seal

When replacing the module with a new one, perform the following procedure.

1. Enter the date of replacement on the EV battery traceability seal packaged with the new part.
2. Cut the EV battery traceability seal in two and affix each seal to the module and “Li-ion BATTERY REPLACEMENT RECORD”.
3. Fill in the “Li-ion BATTERY REPLACEMENT RECORD”.

Front Module Stack

- Check that terminal of front module stack is arranged as shown in the figure.



A. Right side

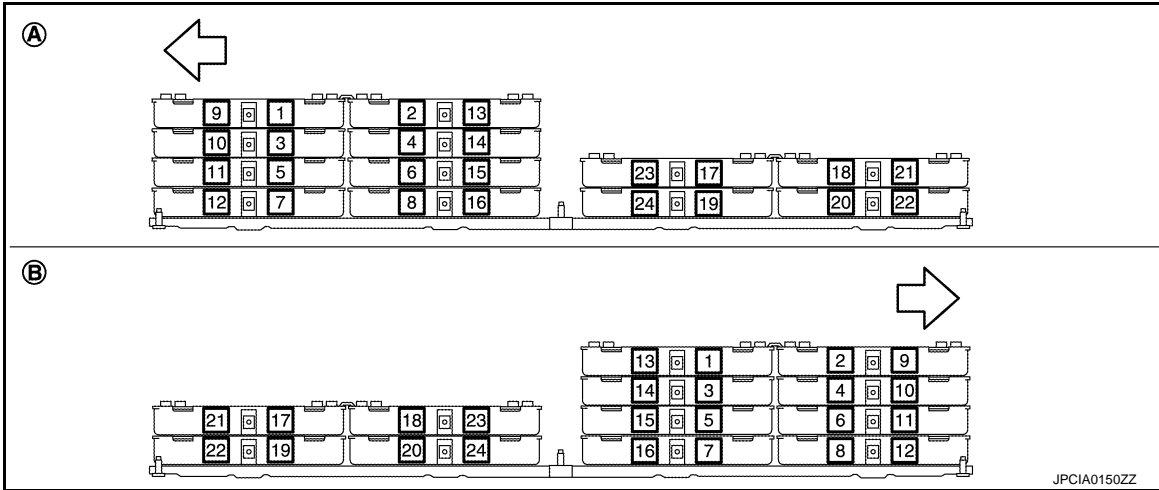
B. Left side

← : Vehicle front

- Tighten mounting bolts in numerical order as shown in the figure.

LI-ION BATTERY

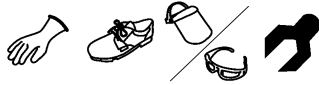
< UNIT DISASSEMBLY AND ASSEMBLY >



A. Right side
 B. Left side
 ⇐ : Vehicle front

DANGER:

- ⚡ Touching high voltage components with using the appropriate protective equipment will cause electrocution.



- ⚡ Work alone. Failure to do this may cause shock hazards.

CAUTION:

- Check the following items after installing battery pack: Refer to [EVB-167. "FRONT MODULE STACK : Inspection"](#).

- AIRTIGHTNESS TEST
- ELECTRIC EQUIPOTENTIAL TEST

FRONT MODULE STACK : Inspection

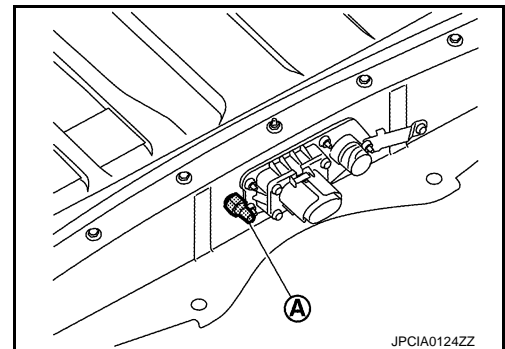
INFOID:000000007063699

AIR TIGHTNESS INSPECTION

- Remove drain plug and install chuck [SST: KV99111400] (A).

WARNING:

- ⚡ To prevent shock hazards, be sure to wear protective gear.



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LI-ION BATTERY

< UNIT DISASSEMBLY AND ASSEMBLY >

2. Install gauge [SST: KV99111400] (A).

WARNING:

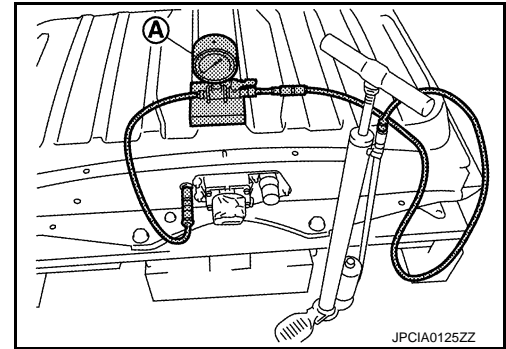


To prevent shock hazards, be sure to wear protective gear.



CAUTION:

Handle the gauge carefully so that it will not drop.

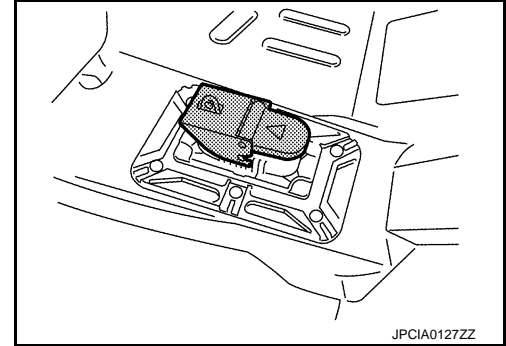


3. Install service lock out plug or service plug.

DANGER:



Touching high voltage components with using the appropriate protective equipment will cause electrocution.

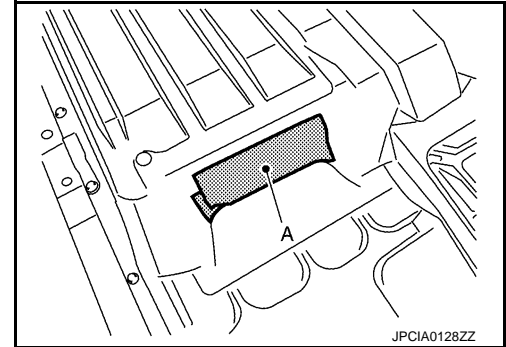


4. Use vinyl tape (A) or similar means to seal the breather so that air does not enter it.

WARNING:



To prevent shock hazards, be sure to wear protective gear.



5. Perform airtightness test by applying 1.6 kPa (0.016 bar, 0.0163 kg/cm², 0.23 psi) of pressure inside the battery pack for approximately 1 minute.

CAUTION:

- When applying pressure, operate the air pump slowly.
- Do not apply any pressure exceeding 1.6 kPa (0.02 bar, 0.0163 kg/cm², 0.29 psi).

Repair limit : 1.4 kPa (0.02 bar, 0.0204 kg/cm², 0.29 psi)

6. If the pressure rises above the limit value, use soapy water and check for leakage points.

WARNING:



To prevent shock hazards, be sure to wear protective gear.



CAUTION:

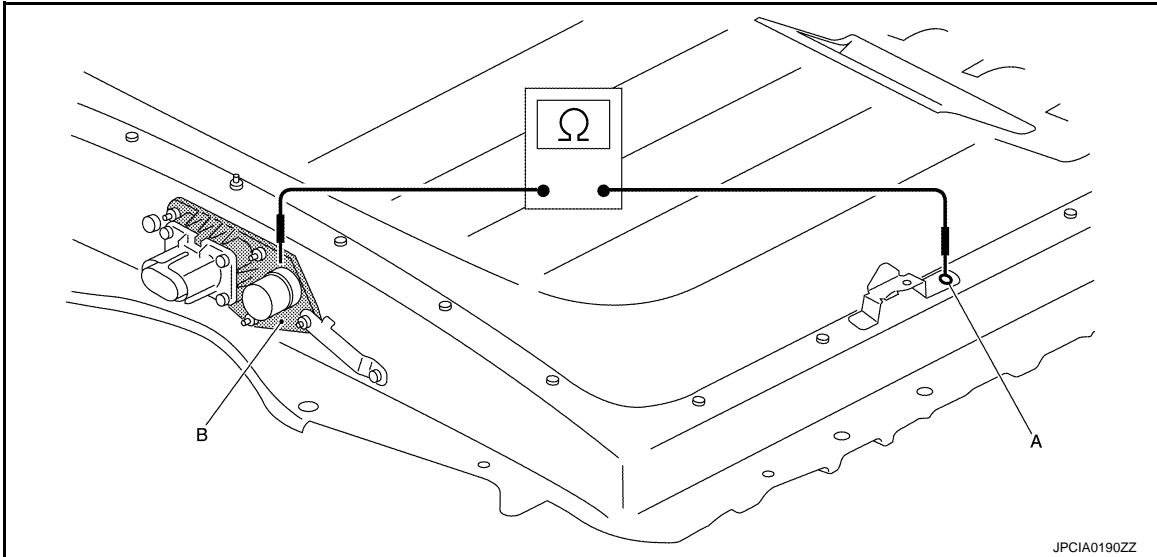
Never allow soapy water to contact the service plug.

Electric Equipotential Test

LI-ION BATTERY

< UNIT DISASSEMBLY AND ASSEMBLY >

After installing the battery pack, measure the resistance between the ground bolt mating surface (A) and the high voltage harness connector flange (B).



WARNING:



To prevent shock hazards, be sure to wear protective gear.



Standard : 0.1 Ω or less

If the result deviates from the standard value, check the following items and repair malfunctioning parts

- Connection condition of ground bolts
- Rust on the mounting surface of ground bolts
- Paint, oil, and dust on the mounting surface of ground bolts

REAR MODULE STACK

REAR MODULE STACK : Disassembly and Assembly

INFOID:000000007005858

WARNING:

- Because 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.
- Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.
- Be sure to wear insulating protective equipment before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.
- Refer to [EV5-5. "High Voltage Precautions"](#).

CAUTION:

There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.

WORK ENVIRONMENT FOR DISASSEMBLY OF LI-ION BATTERY

1. Must be an indoor environment.
 - The work environment must be able to be isolated from the outside by shutters or other means to prevent the intrusion of rain, snow, sand, and other substances.

LI-ION BATTERY

< UNIT DISASSEMBLY AND ASSEMBLY >

- The environment must prevent the entry of sweat during work, and also prevent condensation from occurring as a result of high temperature and humidity.
2. No entry of foreign materials.
 - In addition to being indoors, the environment must not permit the entry during disassembly work of metal powders, oil, or foreign substances resulting from causes such as servicing of other vehicles.
 - If there is any risk of the above, use a plastic curtain or other means to block off the work area, or take other necessary steps.
3. The floor must be dry.
 - The floor must not become wet as a result of causes such as vehicles entering when it is raining or snowing.
4. Work space
 - Space approximately the size of one vehicle must be secured as the disassembly space.
 - A sign indicating that disassembly is in progress or other measures must be taken so that persons other than the workers do not enter the work space.

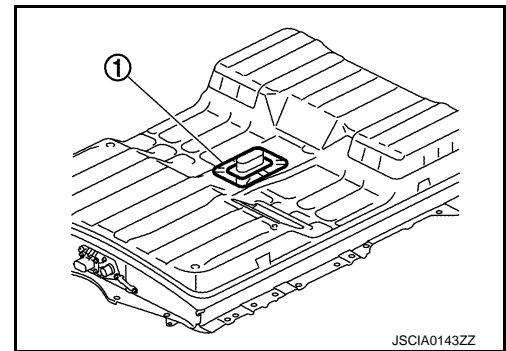
DISASSEMBLY

1. Clean any contamination and dust from the battery pack.
2. Remove service plug retainer (1).

WARNING:

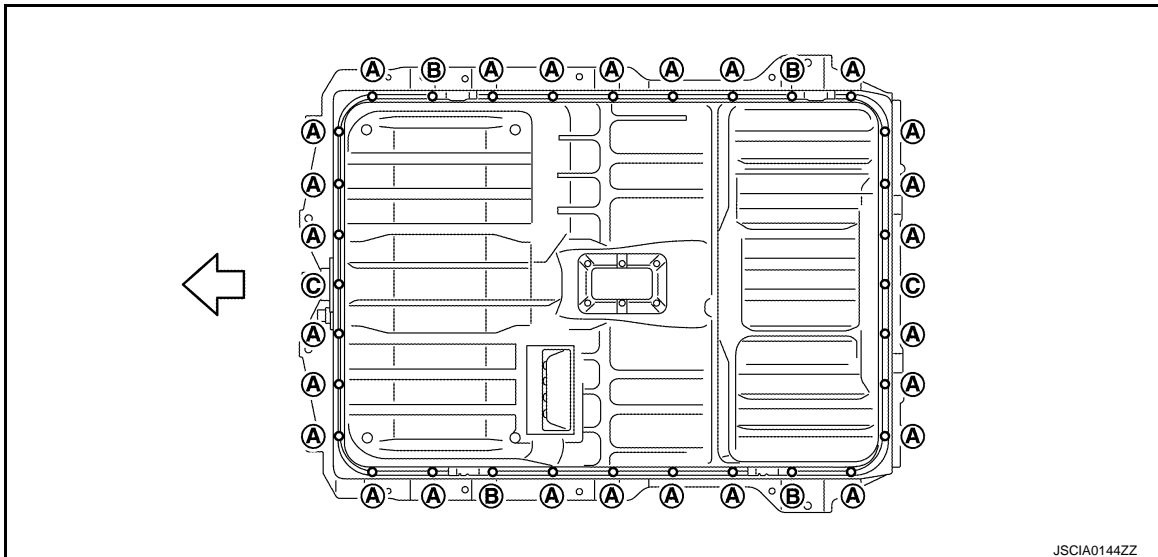


To prevent shock hazards, be sure to wear protective gear.



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3. Remove mounting bolts (A), (B) and mounting nuts (C), then remove battery pack upper case.



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⇐ : Vehicle front

WARNING:



To prevent shock hazards, be sure to wear protective gear.




LI-ION BATTERY

< UNIT DISASSEMBLY AND ASSEMBLY >

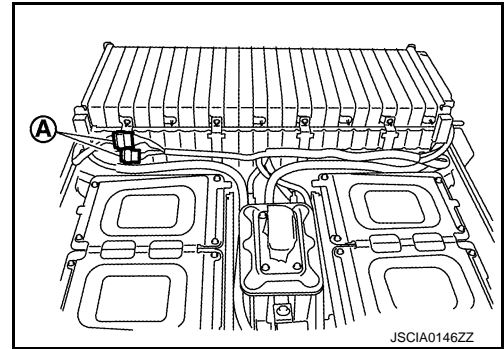
4. Remove vehicle communication harness connector (A) on rear module stack.

WARNING:

-  To prevent shock hazards, be sure to put on insulated protective gear and use insulated tools.



- To prevent shock hazards, immediately wrap insulating tape around disconnected high voltage connector terminals.



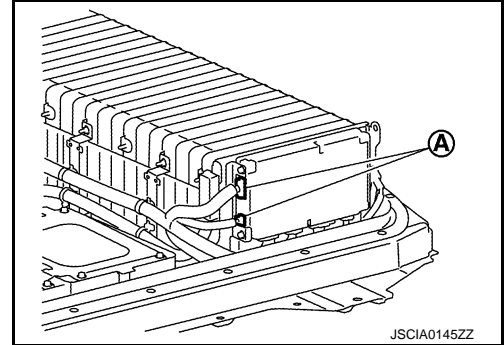
5. Disconnect Li-ion battery controller harness connector (A).

WARNING:

-  To prevent shock hazards, be sure to wear protective gear.



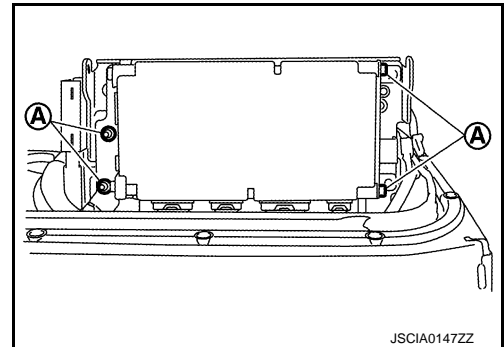
- To prevent shock hazards, immediately wrap insulating tape around disconnected high voltage connector terminals.



6. Remove Li-ion battery controller mounting bolts (A).

WARNING:

-  To prevent shock hazards, be sure to put on insulated protective gear and use insulated tools.



7. Disconnect harness connector and remove Li-ion battery controller.

WARNING:

-  To prevent shock hazards, be sure to wear protective gear.

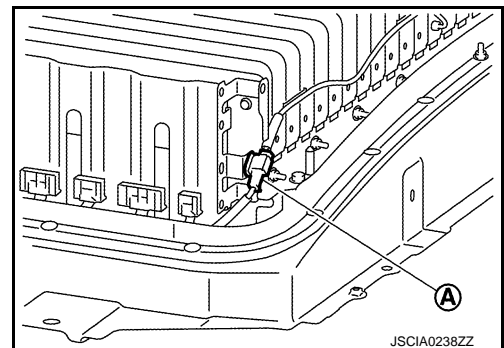


- To prevent shock hazards, immediately wrap insulating tape around disconnected high voltage connector terminals.

8. Disconnect battery temperature sensor harness connector (A) from bracket.

WARNING:

-  To prevent shock hazards, be sure to put on insulated protective gear and use insulated tools.



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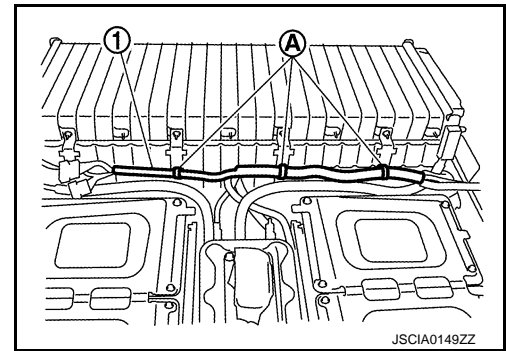
LI-ION BATTERY

< UNIT DISASSEMBLY AND ASSEMBLY >

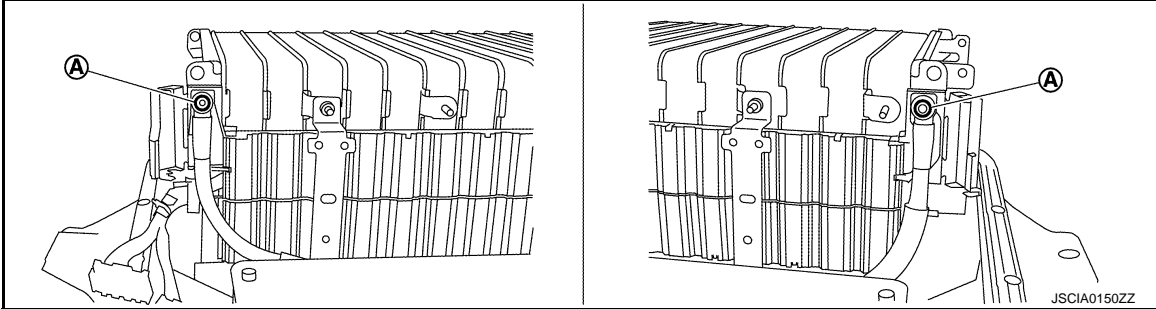
9. Remove harness clip (A) from harness bracket and move vehicle communication harness (1) to the position without the hindrance for work.

WARNING:

 To prevent shock hazards, be sure to put on insulated protective gear and use insulated tools.



10. Remove mounting nuts (A) and remove high voltage harness from rear module stack.



DANGER:

 Touching high voltage components with using the appropriate protective equipment will cause electrocution.



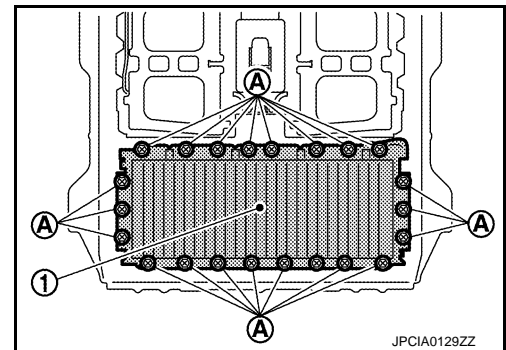
WARNING:

To prevent shock hazards, immediately wrap insulating tape around disconnected high voltage connector terminals.

11. Remove rear module stack (1) mounting bolts (A).

WARNING:


 To prevent shock hazards, be sure to put on insulated protective gear and use insulated tools.

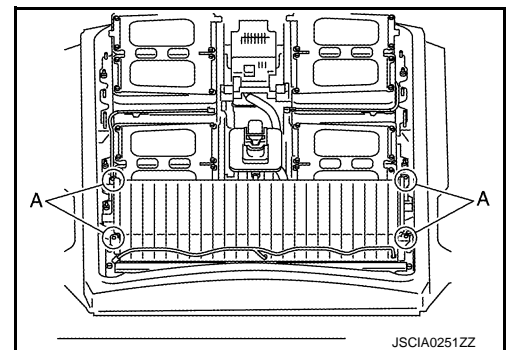


12. Follow the procedure below and remove rear module stack from battery pack.

- a. Attach a carabiner to the position (A) in the figure and connect a lashing belt to it.

WARNING:

 To prevent shock hazards, be sure to wear protective gear.



LI-ION BATTERY

< UNIT DISASSEMBLY AND ASSEMBLY >

- b. Use mobile floor crane (A) to lift up rear module stack (1).

WARNING:

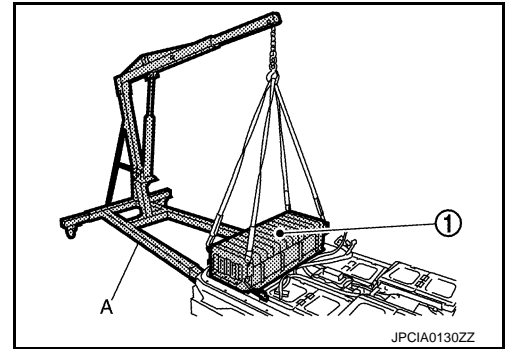


To prevent shock hazards, be sure to wear protective gear.



CAUTION:

Do not move engine crane while rear module stack is hoisted up.



- c. Move the battery pack and place work bench underneath rear module stack.

WARNING:



To prevent shock hazards, be sure to wear protective gear.



CAUTION:

Place removed battery pack upper case onto battery pack for storage.

- d. Place rear module stack onto work bench.

WARNING:



To prevent shock hazards, be sure to wear protective gear.



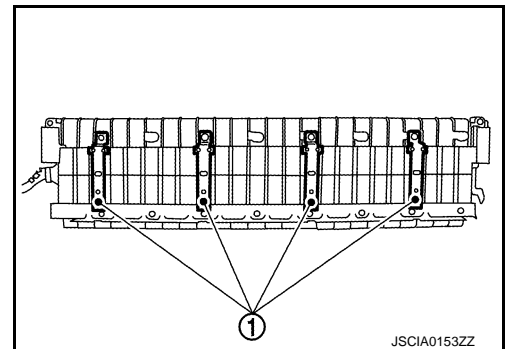
• Be sure to place an insulating rubber sheet on the work bench.

13. Remove harness bracket (1) from rear module stack.

WARNING:



To prevent shock hazards, be sure to put on insulated protective gear and use insulated tools.



14. Follow the procedure below and remove bus bars from rear module stack.

- a. Remove central bus bar cover and remove module terminal mounting bolts (A).

DANGER:



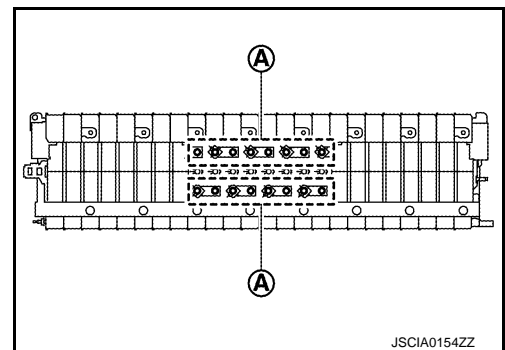
Touching high voltage components with using the appropriate protective equipment will cause electrocution.



• Work alone. Failure to do this may cause shock hazards.

CAUTION:

Remove all bus bar covers at the same time, and do not remove module terminal mounting bolts.



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LI-ION BATTERY

< UNIT DISASSEMBLY AND ASSEMBLY >

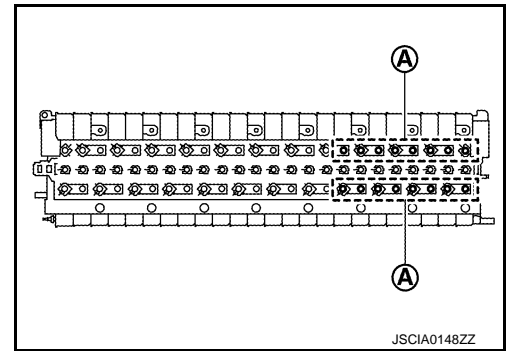
- b. Remove right-side bus bar cover and remove module terminal mounting bolts (A).

DANGER:

-  Touching high voltage components with using the appropriate protective equipment will cause electrocution.



-  Work alone. Failure to do this may cause shock hazards.



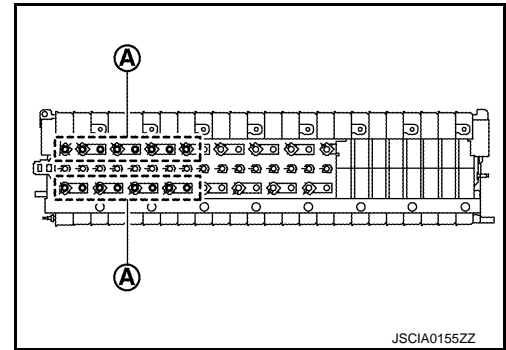
- c. Remove left-side bus bar cover and remove module terminal mounting bolts (A).

DANGER:

-  Touching high voltage components with using the appropriate protective equipment will cause electrocution.



-  Work alone. Failure to do this may cause shock hazards.



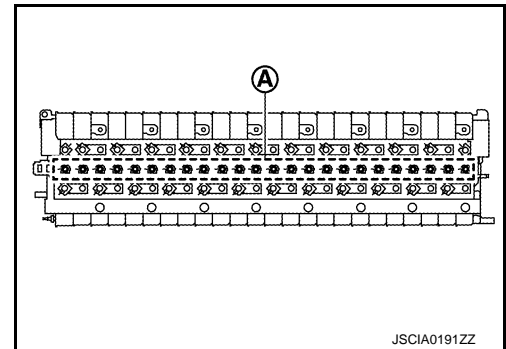
- d. Remove voltage detection terminal mounting screws (A), and then remove bus bar from rear module stack.

DANGER:

-  Touching high voltage components with using the appropriate protective equipment will cause electrocution.



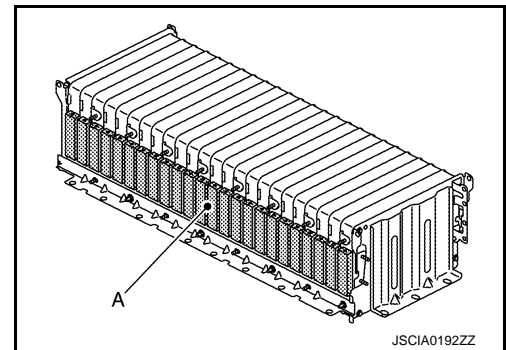
-  Work alone. Failure to do this may cause shock hazards.



- e. Attach module terminal covers [SST: KV99111500] (A) to all module terminals.

WARNING:

-  To prevent shock hazards, be sure to wear protective gear.



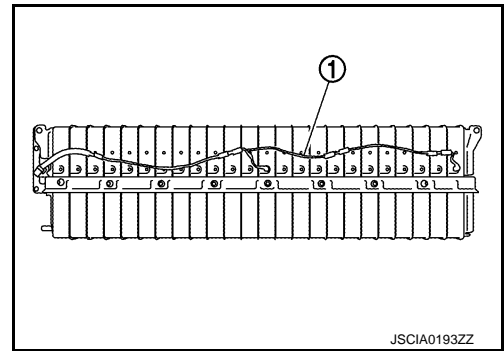
LI-ION BATTERY

< UNIT DISASSEMBLY AND ASSEMBLY >

15. Remove battery temperature sensor (1) from rear module stack.

WARNING:

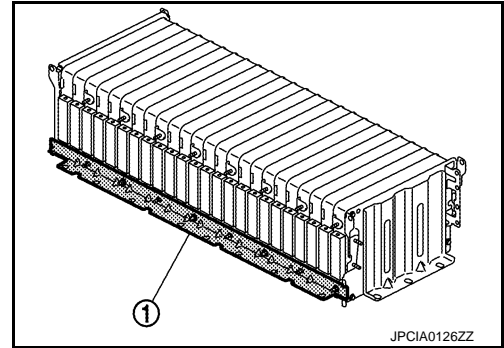
 To prevent shock hazards, be sure to put on insulated protective gear and use insulated tools.



16. Remove front stack member (1).

WARNING:

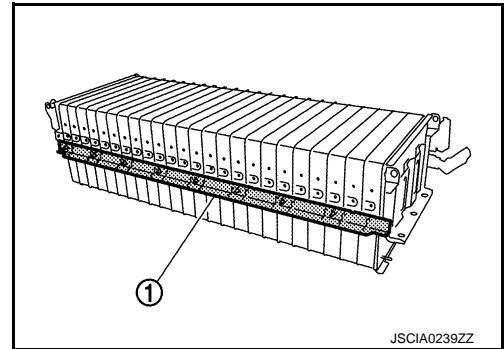
 To prevent shock hazards, be sure to put on insulated protective gear and use insulated tools.



17. Remove rear stack member (1).

WARNING:

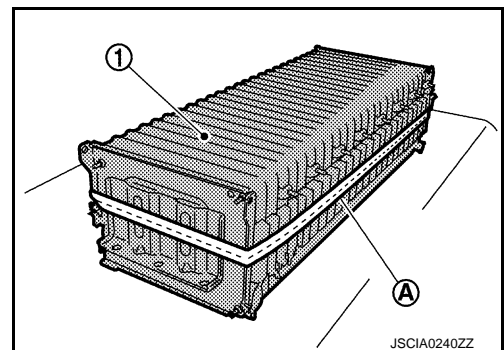
 To prevent shock hazards, be sure to put on insulated protective gear and use insulated tools.



18. Use lashing belt (A) to fix rear module stack (1) in place.

WARNING:

 To prevent shock hazards, be sure to wear protective gear.



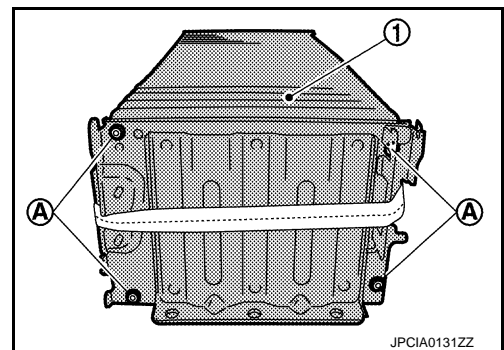
19. Remove through bolt nut (A) and disassemble rear module stack (1).

WARNING:

 To prevent shock hazards, be sure to put on insulated protective gear and use insulated tools.



NOTE:



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LI-ION BATTERY

< UNIT DISASSEMBLY AND ASSEMBLY >

When through bolt is removed, the spacer between the modules will fall out and it will be difficult to return it to its original position. Therefore pull the through bolt out only to the position necessary for the module that will be removed.

ASSEMBLY

CAUTION:

- Perform the “MODULE CHARGE BALANCE” when module is replaced. Refer to [EVB-56, "Work Procedure"](#).

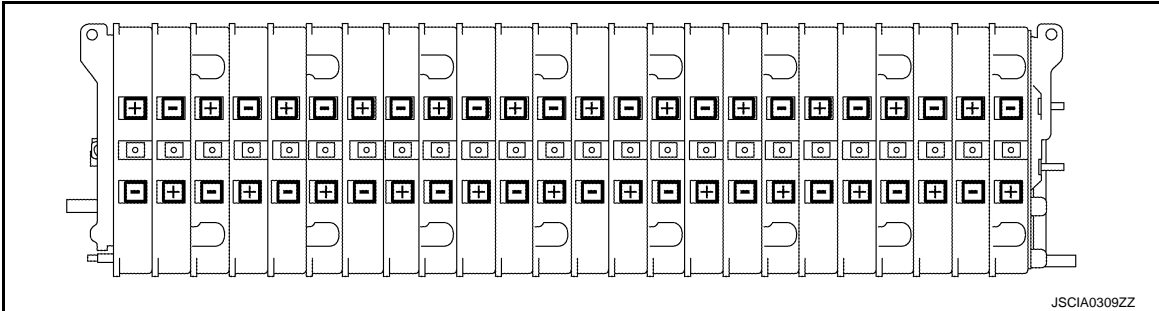
1. When replacing the module with a new one, perform the following procedure.
 - a. Enter the date of replacement on the EV battery traceability seal packaged with the new part.
 - b. Cut the EV battery traceability seal in two and affix each seal to the module and “Li-ion BATTERY REPLACEMENT RECORD”.
 - c. Fill in the “Li-ion BATTERY REPLACEMENT RECORD”.
2. Follow procedure below and assemble rear module stack.
 - a. Assemble rear module stack, and provisionally fasten it in place with the through bolt.

WARNING:

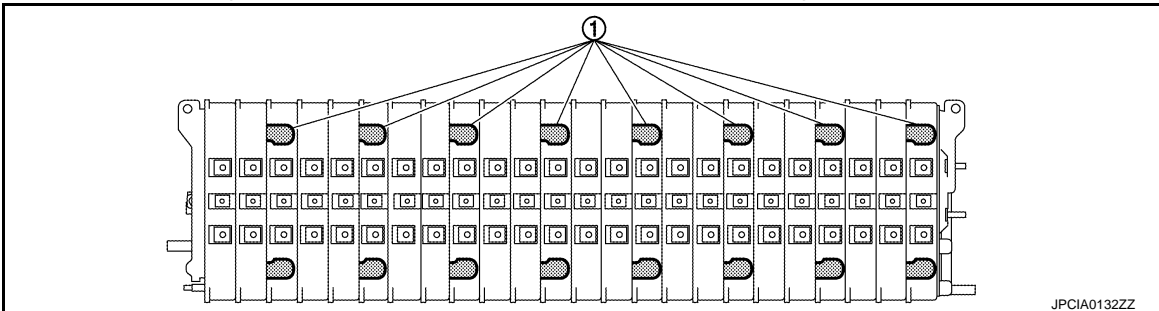
 To prevent shock hazards, be sure to put on insulated protective gear and use insulated tools.



- Check that terminal of module is arranged as shown in the figure.




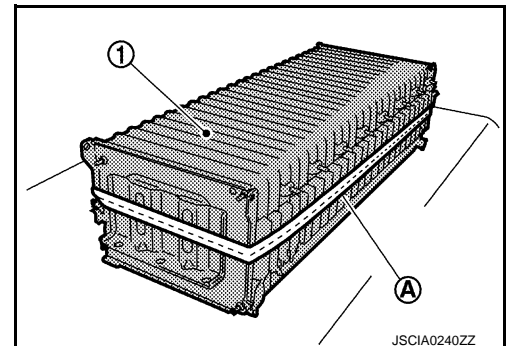
- Check that mounting plate (1) is located at position shown in the figure.



- b. Use lashing belt (A) and apply pressure to rear module stack (1).

WARNING:

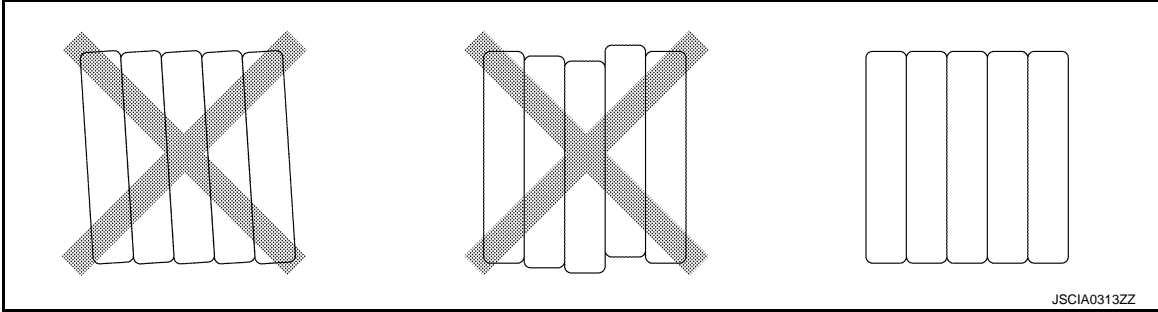
 To prevent shock hazards, be sure to wear protective gear.



LI-ION BATTERY

< UNIT DISASSEMBLY AND ASSEMBLY >

- c. Inspect the module installation condition, and correct it if it is incorrectly installed or a large distortion is found.



WARNING:

 To prevent shock hazards, be sure to put on insulated protective gear and use insulated tools.

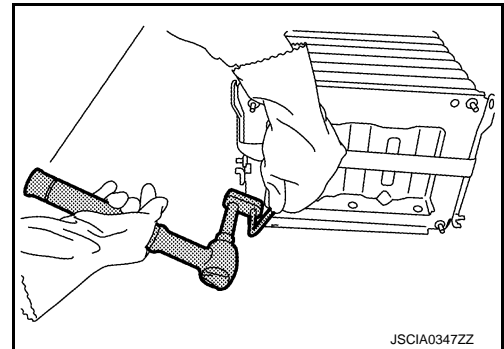
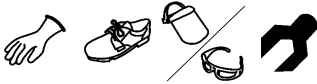


- d. Tighten to the specified torque the mounting nuts for the through bolt that is attached tentatively.

- To tighten rear module stack, fix the tip of through bolt to tighten mounting nuts.

WARNING:

 To prevent shock hazards, be sure to put on insulated protective gear and use insulated tools.

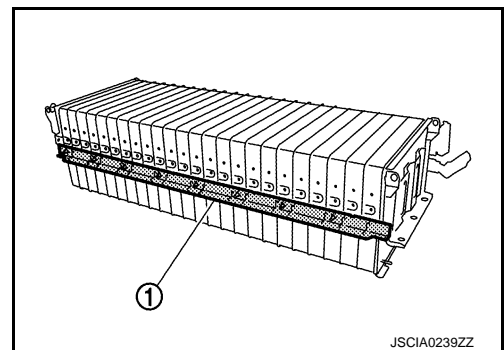


3. Follow procedure below and assemble rear module member.

- a. Temporarily install rear module stack member (1) to rear module stack.


WARNING:

 To prevent shock hazards, be sure to put on insulated protective gear and use insulated tools.



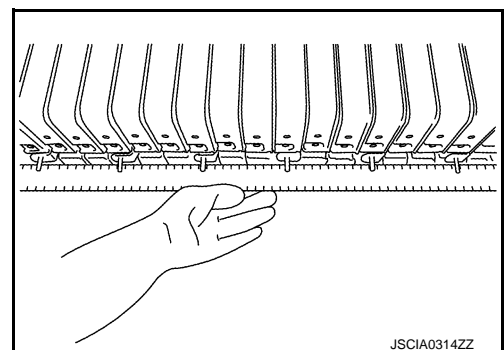
- b. Using the scale (A), inspect the module installation condition.

WARNING:

 To prevent shock hazards, be sure to wear protective gear.



- If the rear module stack is excessively distorted, loosen the through bolt of rear module stack and correct the condition.



- c. Tighten to the specified torque the mounting nuts for the rear stack member.

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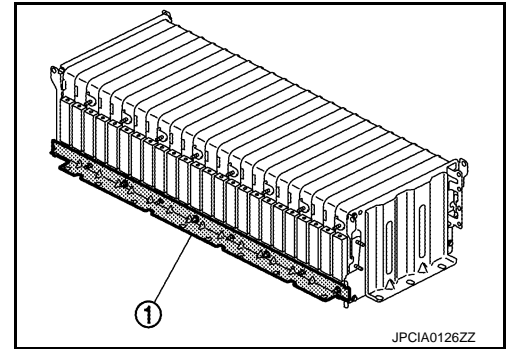
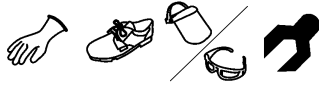
LI-ION BATTERY

< UNIT DISASSEMBLY AND ASSEMBLY >

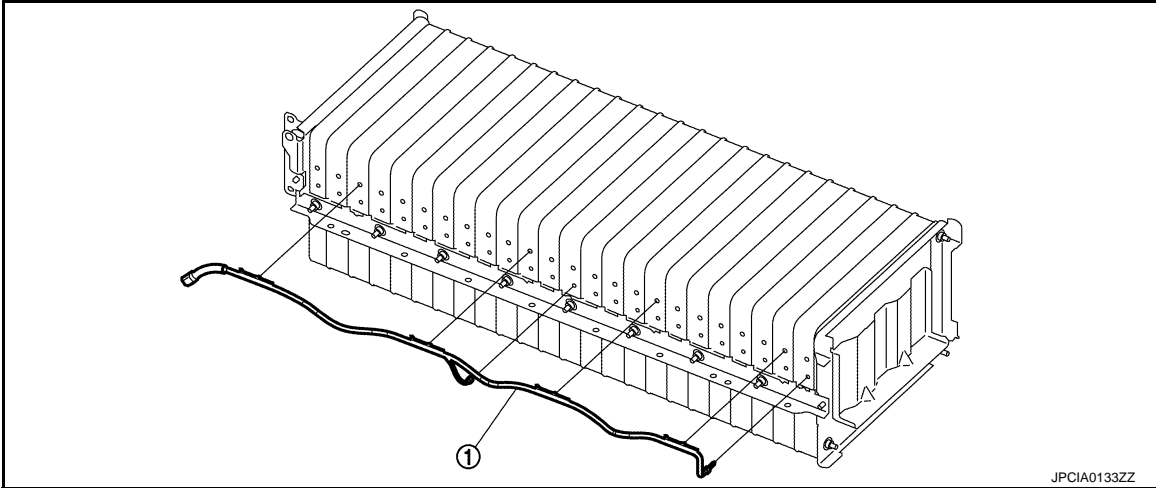
4. Install front stack member (1).

WARNING:

 To prevent shock hazards, be sure to put on insulated protective gear and use insulated tools.



5. Install battery temperature sensor (rear) (1) in the figure.

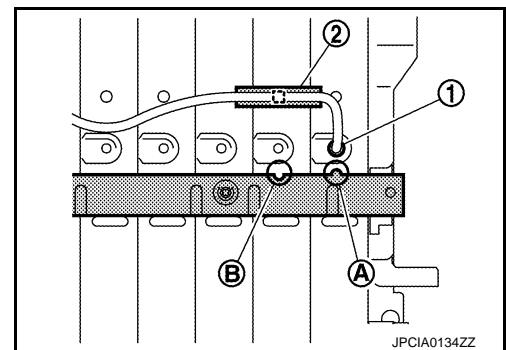


WARNING:

 To prevent shock hazards, be sure to wear protective gear.



- Position module where sensor (1) will be installed so that it is aligned with concave part (A) of rear stack member.
- Position module where clip (2) will be installed so that it is aligned with concave part (B) of rear stack member.



6. Remove module terminal cover [SST: KV99111500].

WARNING:

 To prevent shock hazards, be sure to wear protective gear.



7. Follow the procedure below and install bus bars onto rear module stack.

a. Install bus bars onto rear module stack.

WARNING:

LI-ION BATTERY

< UNIT DISASSEMBLY AND ASSEMBLY >



To prevent shock hazards, be sure to wear protective gear.



- b. Use an insulated torque driver (A) and tighten the voltage detection terminal mounting screws.

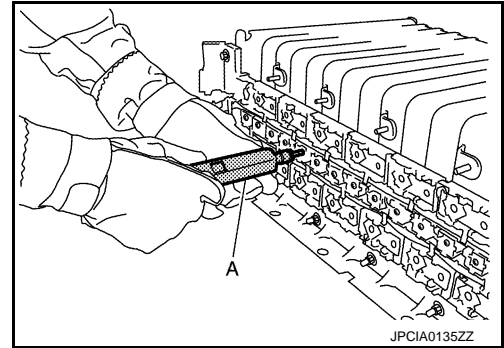
DANGER:



Touching high voltage components with using the appropriate protective equipment will cause electrocution.

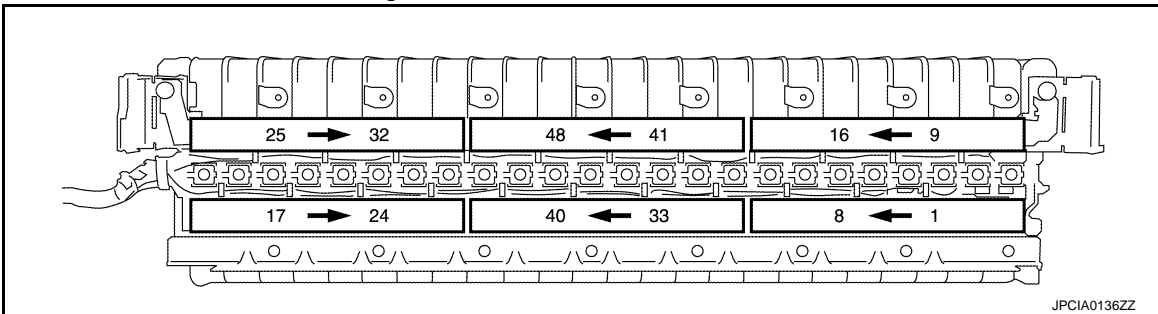


Work alone. Failure to do this may cause shock hazards.



- c. Tighten module terminal mounting bolts in numerical order as shown in the figure.

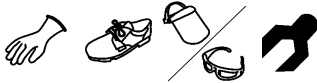
- When bolts 1 – 16 have been tightened, install left side bus bar cover.
- When bolts 17 – 32 have been tightened, install right side bus bar cover.
- When bolts 33 – 48 have been tightened, install center bus bar cover.



DANGER:

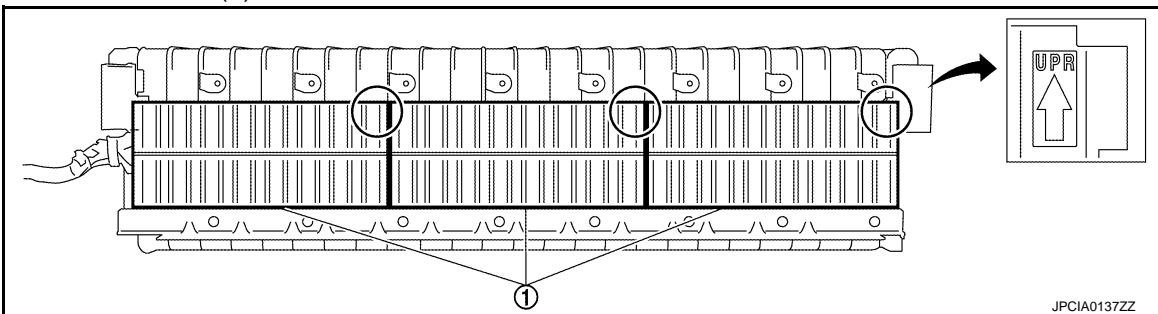


Touching high voltage components with using the appropriate protective equipment will cause electrocution.



Work alone. Failure to do this may cause shock hazards.

- d. Install bus bar cover (1).



WARNING:



To prevent shock hazards, be sure to wear protective gear.



CAUTION:

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LI-ION BATTERY

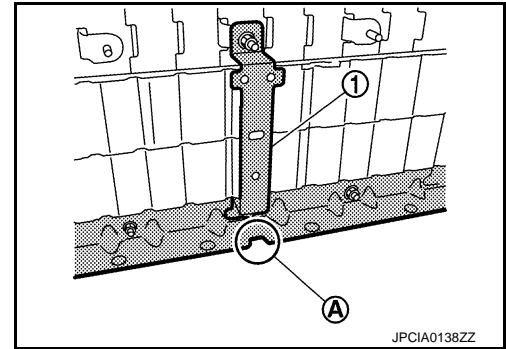
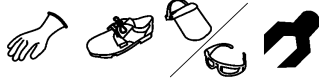
< UNIT DISASSEMBLY AND ASSEMBLY >

- Be sure not to install with up/down sides facing in wrong directions.
- After installation, verify that the joined part does not disconnect.

8. Install harness bracket (1) at position of cut-out (A) in the figure.

WARNING:

 To prevent shock hazards, be sure to put on insulated protective gear and use insulated tools.



9. Follow procedure below and install rear module stack (1) onto battery pack.

a. Use mobile floor crane (A) to lift up rear module stack (1).

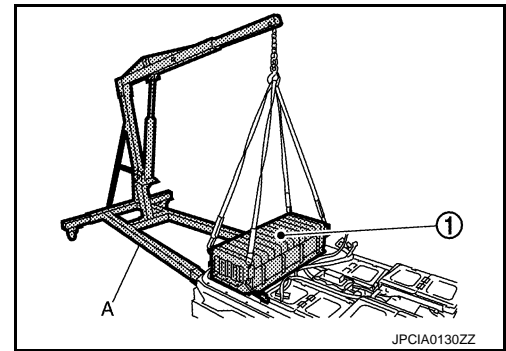
WARNING:

 To prevent shock hazards, be sure to wear protective gear.



CAUTION:

Do not move engine crane while rear module stack is hoisted up.



b. Move work bench so that battery pack is underneath rear module stack.

c. Install rear module stack onto battery pack.

WARNING:

 To prevent shock hazards, be sure to wear protective gear.



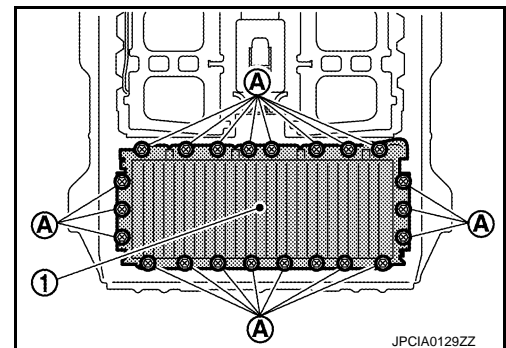
CAUTION:

Align position of locating pin.

10. Tighten rear module stack mounting bolt (A).

WARNING:

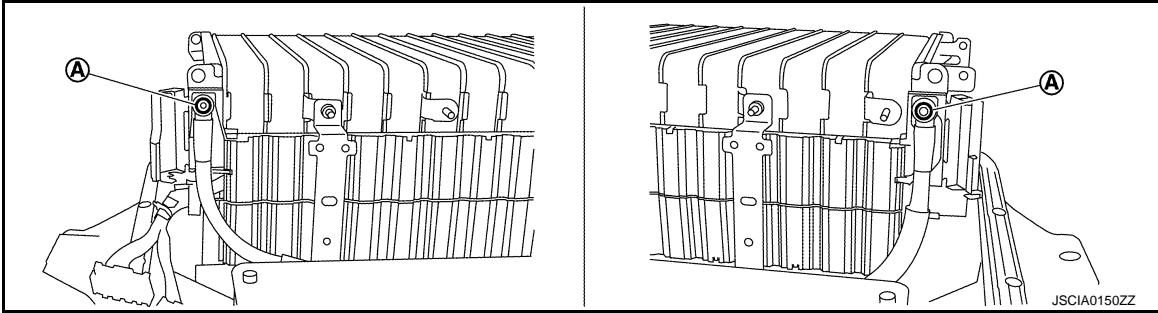
 To prevent shock hazards, be sure to put on insulated protective gear and use insulated tools.



LI-ION BATTERY

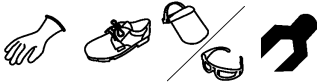
< UNIT DISASSEMBLY AND ASSEMBLY >

11. Tighten mounting nuts (A) and connect high voltage harness to rear module stack.



DANGER:

 Touching high voltage components with using the appropriate protective equipment will cause electrocution.




CAUTION:

Be sure to close terminal cover.

12. Install vehicle communication harness.

WARNING:

 To prevent shock hazards, be sure to wear protective gear.



13. Install Li-ion battery controller.

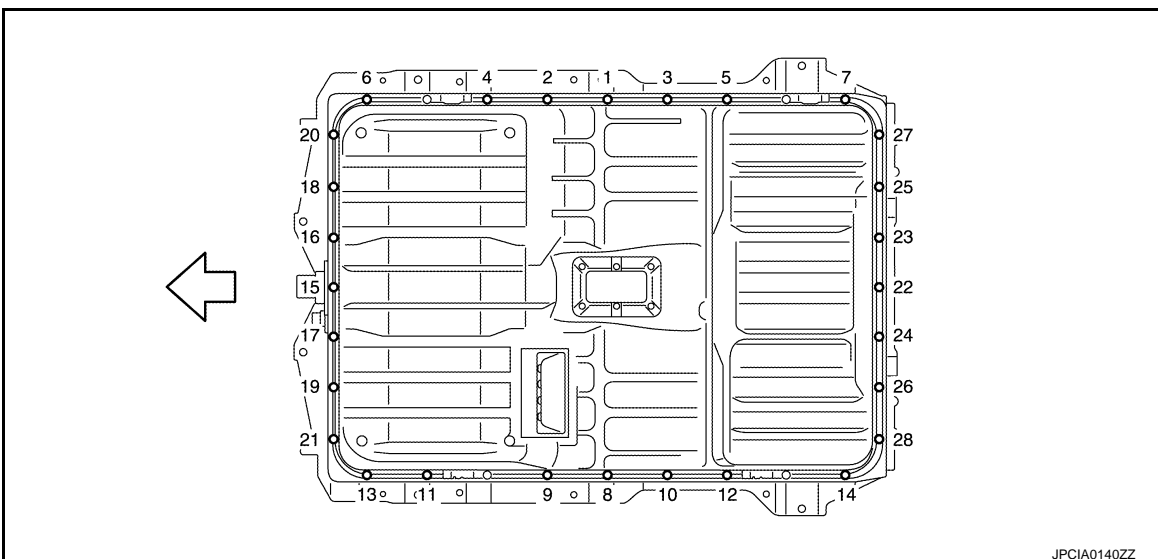
WARNING:

 To prevent shock hazards, be sure to put on insulated protective gear and use insulated tools.



14. Follow the procedure below and install battery pack upper case.

a. Tighten mounting nuts and bolts in numerical order as shown in the figure.



← : Vehicle front

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LI-ION BATTERY

< UNIT DISASSEMBLY AND ASSEMBLY >

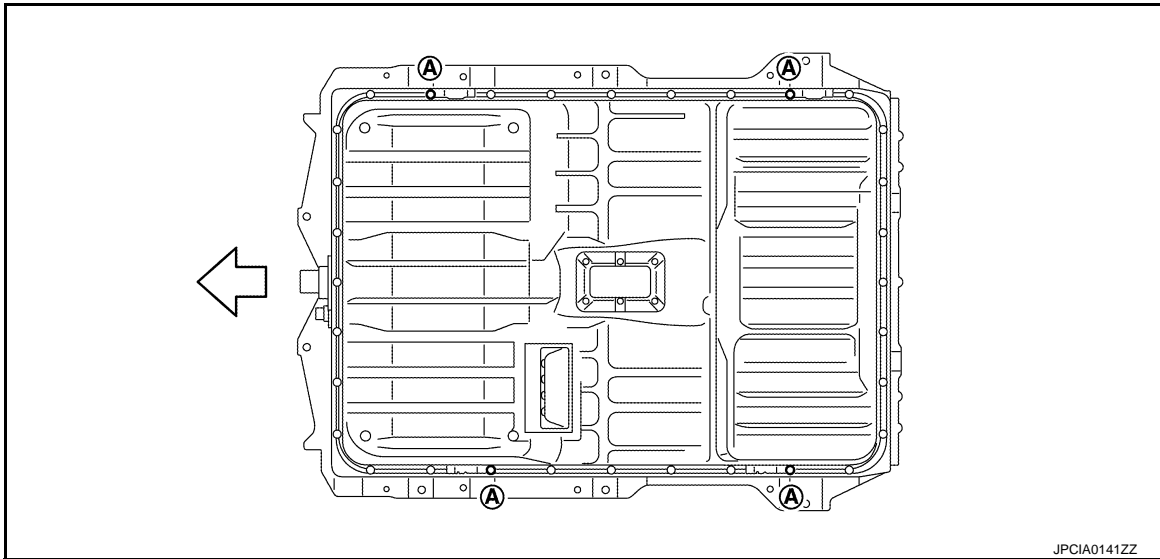
WARNING:



To prevent shock hazards, be sure to wear protective gear.



- b. Install ground bolt (A).



← : Vehicle front

WARNING:



To prevent shock hazards, be sure to wear protective gear.



15. Install service plug retainer.

WARNING:



To prevent shock hazards, be sure to wear protective gear.



CAUTION:

- Check the following items after installing battery pack: Refer to [EVB-182. "REAR MODULE STACK : Inspection"](#).

- AIRTIGHTNESS TEST
- ELECTRIC EQUIPOTENTIAL TEST

REAR MODULE STACK : Inspection

INFOID:000000007063700

AIR TIGHTNESS INSPECTION

LI-ION BATTERY

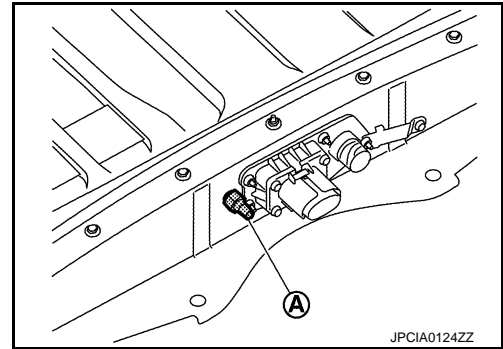
< UNIT DISASSEMBLY AND ASSEMBLY >

1. Remove drain plug and install chuck [SST: KV99111400] (A).

WARNING:



To prevent shock hazards, be sure to wear protective gear.



2. Install gauge [SST: KV99111400] (A).

WARNING:

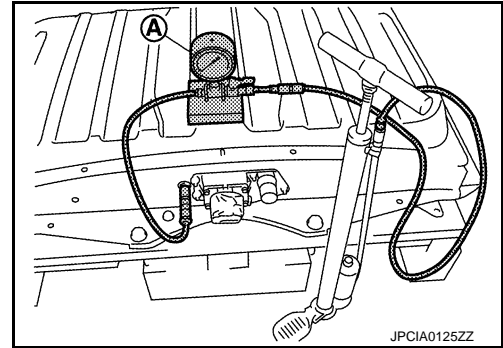


To prevent shock hazards, be sure to wear protective gear.



CAUTION:

Handle the gauge carefully so that it will not drop.

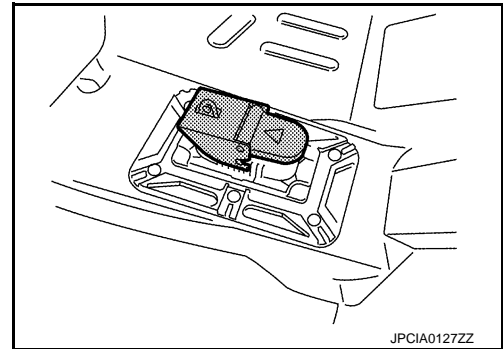


3. Install service lock out plug or service plug.

DANGER:



Touching high voltage components with using the appropriate protective equipment will cause electrocution.

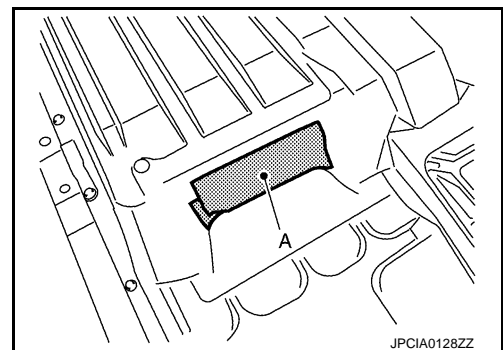


4. Use vinyl tape (A) or similar means to seal the breather so that air does not enter it.

WARNING:



To prevent shock hazards, be sure to wear protective gear.



5. Perform airtightness test by applying 1.6 kPa (0.016 bar, 0.0163 kg/cm², 0.23 psi) of pressure inside the battery pack for approximately 1 minute.

CAUTION:

- When applying pressure, operate the air pump slowly.
- Do not apply any pressure exceeding 1.6 kPa (0.02 bar, 0.0163 kg/cm², 0.29 psi).

Repair limit : 1.4 kPa (0.02 bar, 0.0204 kg/cm², 0.29 psi)

6. If the pressure rises above the limit value, use soapy water and check for leakage points.

WARNING:

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LI-ION BATTERY

< UNIT DISASSEMBLY AND ASSEMBLY >



To prevent shock hazards, be sure to wear protective gear.

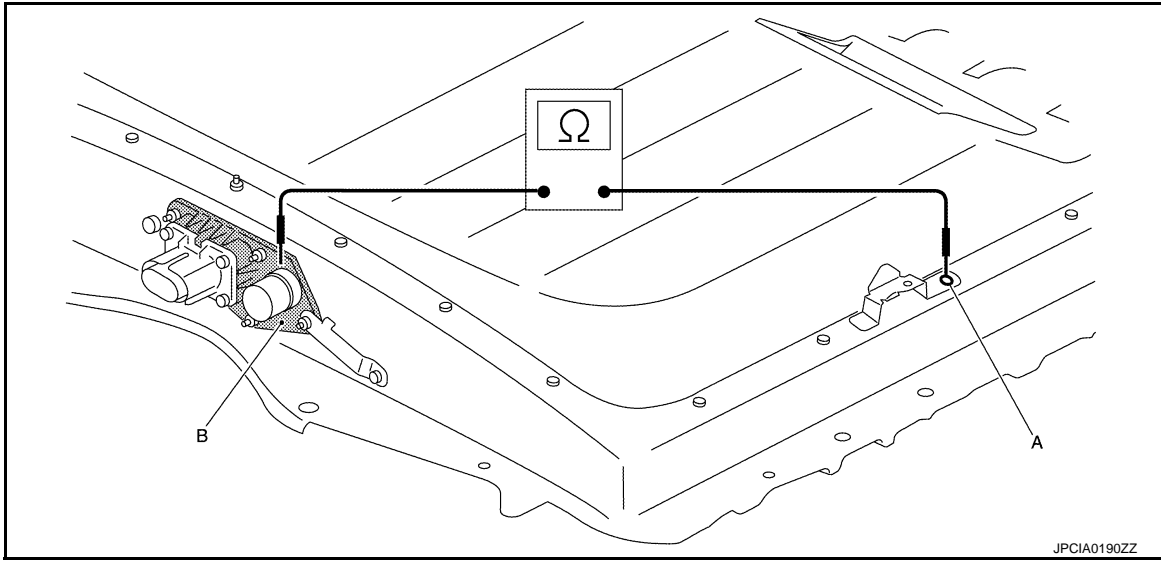


CAUTION:

Never allow soapy water to contact the service plug.

Electric Equipotential Test

After installing the battery pack, measure the resistance between the ground bolt mating surface (A) and the high voltage harness connector flange (B).



WARNING:



To prevent shock hazards, be sure to wear protective gear.



Standard : 0.1 Ω or less

If the result deviates from the standard value, check the following items and repair malfunctioning parts

- Connection condition of ground bolts
- Rust on the mounting surface of ground bolts
- Paint, oil, and dust on the mounting surface of ground bolts

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

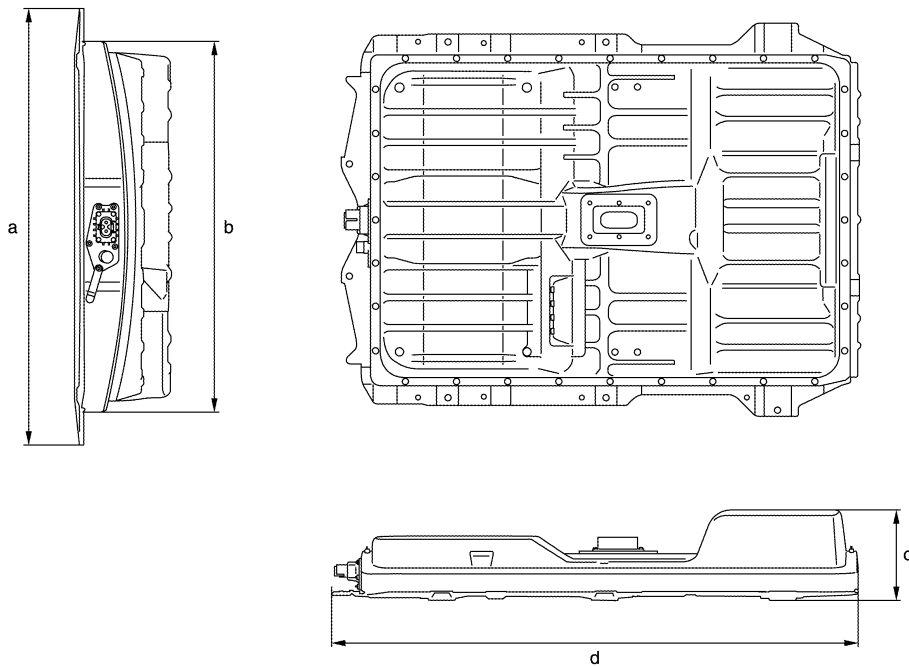
SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Li-ion Battery

INFOID:000000007005860

Items	Specification
Type	Li-ion battery
Structure	48 modules (192 cells)
Rated voltage (v)	Approx. 360
Weight [kg (ib)]	Approx. 300 (661.5)



JPCIA0065ZZ

External dimension	"a"	[mm (in)]	1188.0 (46.77)
	"b"	[mm (in)]	1007.0 (39.65)
	"c"	[mm (in)]	264.9 (10.43)
	"d"	[mm (in)]	1570.5 (61.83)