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SECTION

VEHICLE CHARGING SYSTEM

CONTENTS

<p>PRECAUTION 4</p> <p>PRECAUTIONS 4</p> <p style="padding-left: 20px;">Precaution for Technicians Using Medical Electric.....4</p> <p style="padding-left: 20px;">Point to Be Checked Before Starting Maintenance Work4</p> <p style="padding-left: 20px;">Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"4</p> <p style="padding-left: 20px;">Precaution for Procedure without Cowl Top Cover.....5</p> <p style="padding-left: 20px;">Precautions for Removing Battery Terminal5</p> <p style="padding-left: 20px;">High Voltage Precautions6</p> <p>PREPARATION 8</p> <p>PREPARATION 8</p> <p style="padding-left: 20px;">Commercial Service Tools8</p> <p>SYSTEM DESCRIPTION10</p> <p>COMPONENT PARTS10</p> <p style="padding-left: 20px;">Component Parts Location10</p> <p style="padding-left: 20px;">On-board Charger10</p> <p style="padding-left: 20px;">Immediate Charging Switch11</p> <p style="padding-left: 20px;">Charge Port11</p> <p style="padding-left: 20px;">EVSE11</p> <p style="padding-left: 20px;">Charging Status Indicator12</p> <p style="padding-left: 20px;">High Voltage Warning Label13</p> <p>SYSTEM14</p> <p style="padding-left: 20px;">System Description14</p> <p style="padding-left: 20px;">Circuit Diagram15</p> <p>STRUCTURE AND OPERATION16</p> <p style="padding-left: 20px;">On-board Charger16</p> <p>HANDLING PRECAUTION17</p> <p style="padding-left: 20px;">Li-ion Battery Charging System17</p> <p>ON BOARD DIAGNOSTIC (OBD) SYSTEM18</p> <p style="padding-left: 20px;">Diagnosis Description18</p> <p style="padding-left: 20px;">Counter System18</p>	<p style="padding-left: 20px;">DTC and Freeze Frame Data18</p> <p>DIAGNOSIS SYSTEM (ON-BOARD CHARGER)19</p> <p style="padding-left: 20px;">CONSULT Function19</p> <p>ECU DIAGNOSIS INFORMATION22</p> <p>ON BOARD CHARGER22</p> <p style="padding-left: 20px;">Reference Value22</p> <p style="padding-left: 20px;">Fail-Safe26</p> <p style="padding-left: 20px;">DTC Index27</p> <p style="padding-left: 20px;">DTC Sub Type Index28</p> <p>WIRING DIAGRAM30</p> <p>ON BOARD CHARGER30</p> <p style="padding-left: 20px;">Wiring Diagram30</p> <p>BASIC INSPECTION32</p> <p>DIAGNOSIS AND REPAIR WORK FLOW32</p> <p style="padding-left: 20px;">Work Flow32</p> <p style="padding-left: 20px;">Diagnostic Work Sheet34</p> <p>PERIODIC MAINTENANCE37</p> <p>CHARGE PORT37</p> <p style="padding-left: 20px;">Inspection37</p> <p>DTC/CIRCUIT DIAGNOSIS38</p> <p>POWER SUPPLY AND GROUND CIRCUIT38</p> <p style="padding-left: 20px;">Diagnosis Procedure38</p> <p>U1000 CAN COMMUNICATION41</p> <p style="padding-left: 20px;">Description41</p> <p style="padding-left: 20px;">DTC Logic41</p> <p style="padding-left: 20px;">Diagnosis Procedure41</p> <p>U1008, U100B QUICK CHARGER COMMUNICATION42</p> <p style="padding-left: 20px;">Description42</p>
--	--

D
E
F
G
H
I
J
K
L
M
N
O
P

DTC Logic	42	B2850 ON-BOARD CHARGER	72
Diagnosis Procedure	42	Description	72
Component Inspection (Quick Charge Port)	43	DTC Logic	72
U100A CAN COMMUNICATION	45	Diagnosis Procedure	72
Description	45	B2880 F/S CHG RELAY	74
DTC Logic	45	DTC Logic	74
Diagnosis Procedure	45	TYPE A	74
U1010 CONTROL UNIT (CAN)	46	TYPE A : Diagnosis Procedure	74
DTC Logic	46	TYPE B	76
Diagnosis Procedure	46	TYPE B : Diagnosis Procedure	76
B2801 QUICK CHARGE CONNECTOR	47	B28A0 NORMAL CHARGING CONNECTOR	
DTC Logic	47	CONNECTION DETECTING CIRCUIT	79
Diagnosis Procedure	47	Description	79
Component Inspection (Quick Charge Port)	49	DTC Logic	79
B2802 QUICK CHARGER	51	Diagnosis Procedure	79
DTC Logic	51	B28B0 NORMAL CHARGE HIGH VOLTAGE	
Diagnosis Procedure	51	CIRCUIT	82
Component Inspection (Quick Charge Port)	52	Description	82
B2803 QUICK CHARGER	54	DTC Logic	82
DTC Logic	54	Diagnosis Procedure	82
Diagnosis Procedure	54	B2900, B2902 ON-BOARD CHARGER	84
B2813 NORMAL CHARGE RELAY	56	DTC Logic	84
DTC Logic	56	Diagnosis Procedure	84
Diagnosis Procedure	56	B2980 QUICK CHARGE PORT	85
B2814 QUICK CHARGE RELAY	57	Description	85
DTC Logic	57	DTC Logic	85
Diagnosis Procedure	57	Diagnosis Procedure	85
B2820 QUICK CHARGER	58	Component Inspection (Quick Charge Port)	87
DTC Logic	58	B29A0 NORMAL CHARGE PORT	88
Diagnosis Procedure	58	DTC Logic	88
B2821 12V POWER SUPPLY	59	TYPE A	88
DTC Logic	59	TYPE A : Diagnosis Procedure	88
Diagnosis Procedure	59	TYPE B	90
B2827 NORMAL CHARGE RELAY	60	TYPE B : Diagnosis Procedure	90
DTC Logic	60	Component Inspection (Normal Charge Port)	90
Diagnosis Procedure	60	B29C1 EVSE	91
B2830 QUICK CHARGE VOLTAGE SENSOR..	63	DTC Logic	91
Description	63	TYPE A, B AND E	92
DTC Logic	63	TYPE A, B AND E : Diagnosis Procedure	92
Diagnosis Procedure	63	TYPE C AND D	93
Component Inspection (Quick Charge Voltage Sensor)	67	TYPE C AND D : Diagnosis Procedure	93
B2840 ON-BOARD CHARGER	69	ON BOARD CHARGER	95
DTC Logic	69	Component Insulation Resistance Check	95
TYPE A, B, AND C	70	CHARGING STATUS INDICATOR	97
TYPE A, B, AND C : Diagnosis Procedure	70	Diagnosis Procedure	97
TYPE D	70	IMMEDIATE CHARGING SWITCH	98
TYPE D : Diagnosis Procedure	70	Diagnosis Procedure	98

SYMPTOM DIAGNOSIS	99	QUICK CHARGE PORT	110	
ON BOARD CHARGER	99	Exploded View	110	A
Description	99	Removal and Installation	110	
NORMAL OPERATING CONDITION	100	Disassembly and Assembly	113	
Symptom Table	100	NORMAL CHARGE PORT	115	B
REMOVAL AND INSTALLATION	105	Exploded View	115	
ON BOARD CHARGER	105	Removal and Installation	115	
Exploded View	105	Disassembly and Assembly	117	VC
Removal and Installation	105	IMMEDIATE CHARGING SWITCH	120	
Inspection	109	Removal and Installation	120	D
		CHARGING STATUS INDICATOR	121	
		Removal and Installation	121	E
				F
				G
				H
				I
				J
				K
				L
				M
				N
				O
				P

PRECAUTIONS

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PRECAUTIONS

Precaution for Technicians Using Medical Electric

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OPERATION PROHIBITION

WARNING:

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

NORMAL CHARGE PRECAUTION

WARNING:

- If a technician uses a medical electric device such as an implantable cardiac pacemaker or an implantable cardioverter defibrillator, the possible effects on the devices must be checked with the device manufacturer before starting the charge operation.
- As radiated electromagnetic wave generated by 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.

PRECAUTION AT TELEMATICS SYSTEM OPERATION

WARNING:

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

PRECAUTION AT INTELLIGENT KEY SYSTEM OPERATION

WARNING:

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

Point to Be Checked Before Starting Maintenance Work

INFOID:000000007633981

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:000000007633982

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

PRECAUTIONS

< PRECAUTION >

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:

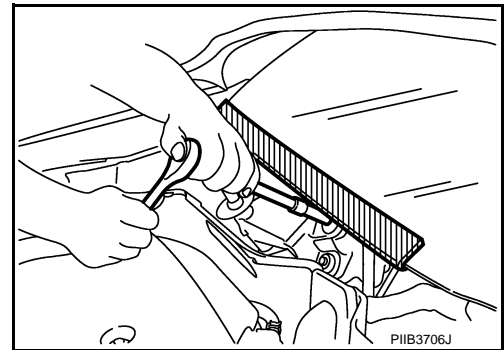
Always observe the following items for preventing accidental activation.

- 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.

Precaution for Procedure without Cowl Top Cover

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



Precautions for Removing Battery Terminal

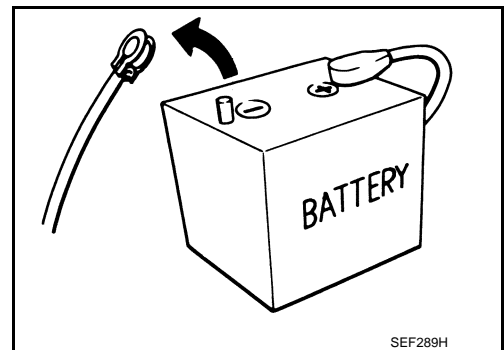
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- When removing the 12V battery terminal, turn OFF the power switch and wait at least 5 minutes.

NOTE:

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

- Always disconnect the battery terminal within 60 minutes after turning OFF the power switch. Even when the power switch is OFF, the 12V battery automatic charge control may automatically start after a lapse of 60 minutes from power switch OFF.
- Disconnect 12V battery terminal according to the following steps.



WORK PROCEDURE

1. Check that EVSE is not connected.

NOTE:

If EVSE is connected, the air conditioning system may be automatically activated by the timer A/C function.

2. Turn the power switch OFF → ON → OFF. Get out of the vehicle. Close all doors (including back door).

PRECAUTIONS

< PRECAUTION >

3. Check that the charge status indicator lamp does not blink and wait for 5 minutes or more.
NOTE:
If the battery is removed within 5 minutes after the power switch is turned OFF, plural DTCs may be detected.
4. Remove 12V battery terminal within 60 minutes after turning the power switch OFF → ON → OFF.
CAUTION:
 - After all doors (including back door) are closed, if a door (including back door) is opened before battery terminals are disconnected, start over from Step 1.
 - After turning the power switch OFF, if "Remote A/C" is activated by user operation, stop the air conditioner and start over from Step 1.**NOTE:**
Once the power switch is turned ON → OFF, the 12V battery automatic charge control does not start for approximately 1 hour.
- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the power switch.
NOTE:
If the power switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.
- After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.
NOTE:
The removal of 12V battery may cause a DTC detection error.

High Voltage Precautions

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DANGER:



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

WARNING:

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

CAUTION:

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

HIGH VOLTAGE HARNESS AND EQUIPMENT IDENTIFICATION

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

HANDLING OF HIGH VOLTAGE HARNESS AND TERMINALS

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

REGULATIONS ON WORKERS WITH MEDICAL ELECTRONICS

WARNING:

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

PROHIBITED ITEMS TO CARRY DURING THE WORK

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

PRECAUTIONS

< PRECAUTION >

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

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

Person in charge: _____

DO NOT TOUCH!

REPAIR IN PROGRESS.

HIGH VOLTAGE

DANGER:

DANGER:

HIGH VOLTAGE

REPAIR IN PROGRESS.

DO NOT TOUCH!

Person in charge: _____

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PREPARATION

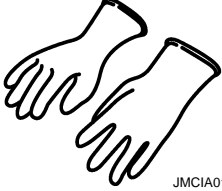
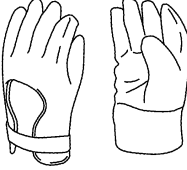

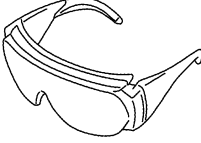
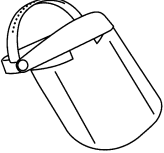
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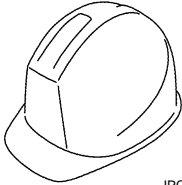
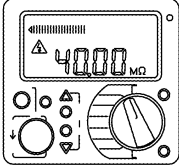
Commercial Service Tools

INFOID:000000007633986

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>Face shield</p>	 <p>JPCIA0167ZZ</p>	<ul style="list-style-type: none"> • Removing and installing high voltage components • To protect face from the spatter on the work to electric line

PREPARATION

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Tool name		Description
Insulated helmet	 <p>JPCIA0013ZZ</p>	Removing and installing high voltage components
Insulation resistance tester (Multi tester)	 <p>JPCIA0014ZZ</p>	Measuring voltage and insulation resistance

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COMPONENT PARTS

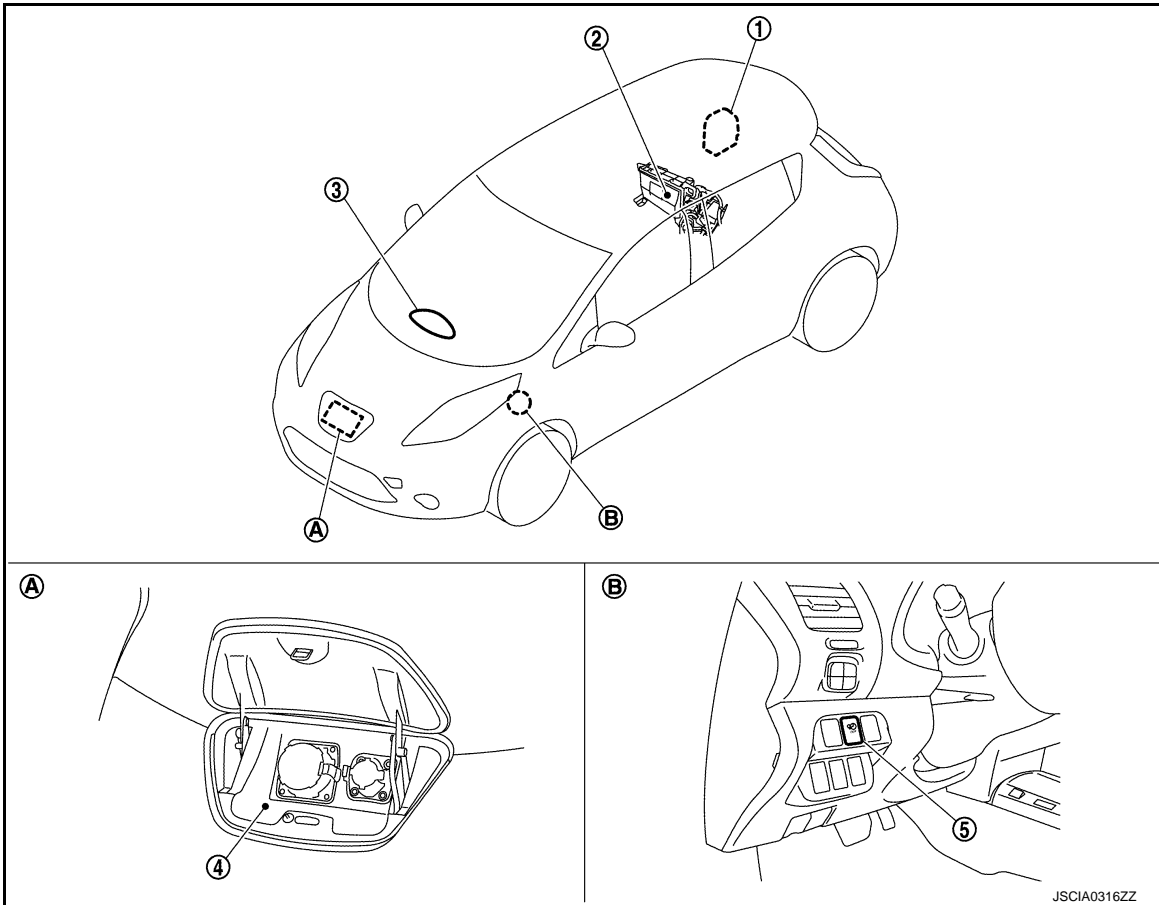
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SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

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No.	Component	Reference
1	EVSE	VC-11. "EVSE"
2	On-board charger	VC-10. "On-board Charger"
3	Charging status indicator	VC-12. "Charging Status Indicator"
4	Charge port*	VC-11. "Charge Port"
5	Immediate charging switch	VC-11. "Immediate Charging Switch"

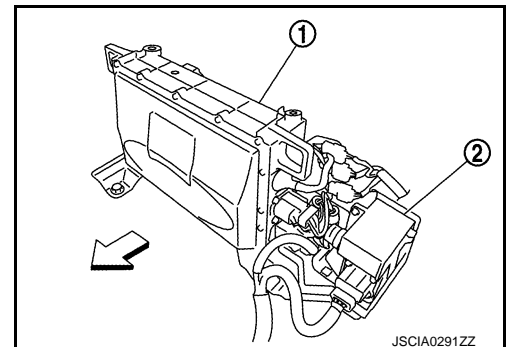
*: The figure shows a model with quick charge port.

On-board Charger

INFOID:000000007633988

The on-board charger (1) converts external AC power to DC power (260 – 410 V) and charges the Li-ion battery. When charging, the on-board charger communicates with VCM, LBC, EVSE control box, and quick charger, and starts charging corresponding to the charge type.

Furthermore, a noise filter (2) is installed in the on-board charger to prevent the noise generated by the vehicle from affecting the external power supply side.



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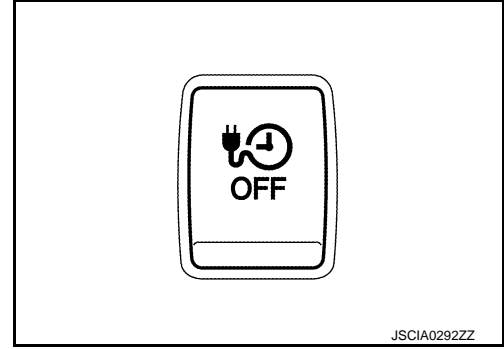
COMPONENT PARTS

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Immediate Charging Switch

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



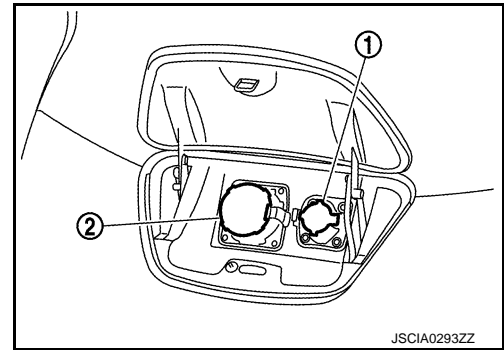
Charge Port

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The charge port is installed at the front of the vehicle and is equipped with a normal charge port (1) and a quick charge port (2) (with quick charge port models). For charging, connect the EVSE or quick charge connector to the charge port according to the type of charging, and then start charging.

NOTE:

The figure shows a model with quick charge port.

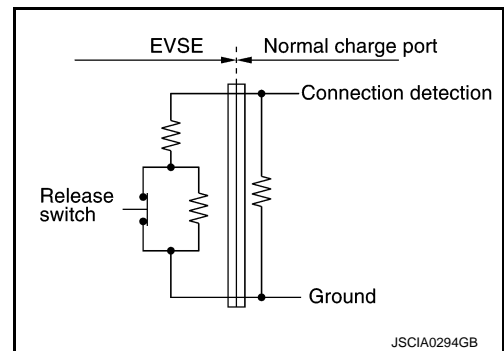


EVSE

INFOID:000000007633991

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

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



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

<List of Operations>

Vehicle condition	Illumination status		
	READY	CHARGE	FAULT
When there is AC power supply input and the EVSE can communicate with the on-board charger (when not charging)	ON	OFF	OFF
Charging	ON	ON	OFF
When there is no AC power supply input	OFF	OFF	OFF

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COMPONENT PARTS

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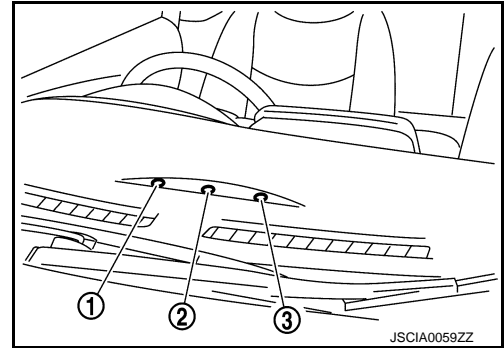
Vehicle condition	Illumination status		
	READY	CHARGE	FAULT
When the EVSE is not operating	OFF	OFF	OFF
When the EVSE detects electric leakage	ON	OFF	Blink
When the AC power supply voltage drops	ON	OFF	Blink
When the EVSE detects a malfunction in itself	ON	OFF	ON
When the ground line is disconnected	Blink	OFF	OFF

Charging Status Indicator

INFOID:000000007633992

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

- 1 : Charge indicator lamp 1
- 2 : Charge indicator lamp 2
- 3 : Charge indicator lamp 3



Charge indicator lamp illuminates and blinks as per the following:

Indicator illuminating pattern

	Full charge	During charge	Timer charge ON	Immediate charge ON	During following conditions • Automatic 12V battery charging • Timer/remote A/C operates • Li-ion battery heater operates*
	1 2 3	1 2 3	1 2 3	1 2 3	
Indicator lamp	█ █ █	A: ✱ █ █ B: █ ✱ █ C: █ █ ✱	A: █ █ █ B: █ █ █ C: █ █ █	█ █ █	█ █ ✱
Illuminating (blinking) time	ON OFF 15min	ON OFF 1sec 1sec	A ON OFF 0.5 sec 0.5 sec B ON OFF 0.5 sec C ON OFF 0.5 sec	ON OFF 15min	ON OFF 1sec 1sec
Condition	ON for 15 minutes.	Li-ion battery available charge gauge (segments) A: 0-3 B: 4-8 C: 9-12	ON-OFF repeats for 15 minutes.	ON for 15 minutes.	Blinks during operation.

█ : Illuminating ✱ : Blinking

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*: With Li-ion battery heater models

COMPONENT PARTS

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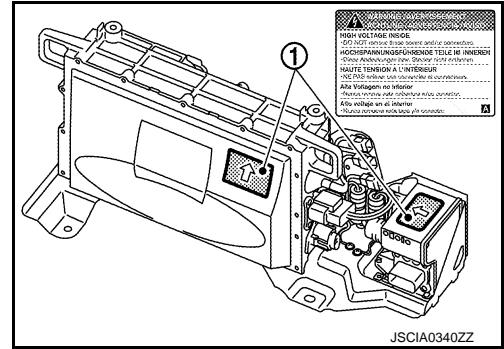
High Voltage Warning Label

INFOID:000000007633993

- The high voltage warning labels (1) are affixed to the front side of on-board charger and top of noise filter.

← : Direction of the label

- After replacing on-board charger, check that the labels are affixed in the original position.



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System Description

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DESCRIPTION

On-board charger uses a 2-converter system which consists of the PFC circuit and the DC/DC converter. It improves charging efficiency, full-charge accuracy and service life of the Li-ion battery. On-board charger judges external power supply voltage, and automatically switches to the charging appropriate for the power supply.

NOTE:

PFC (Power Factor Correction) circuit is a power factor improvement circuit. It is a device for converting AC power (input from external source) to DC power efficiently.

DESCRIPTION OF CHARGE CONTROL

For information about charge control, refer to [EVC-39, "LI-ION BATTERY CHARGE CONTROL : System Description"](#).

NOTE:

- Li-ion battery charge does not start when the power switch is ON. When it is required to charge with the power switch ON, start charging before turning ON the power switch.
- When the charging connector is connected to the charge port in the READY state, READY is turned OFF, the power switch is turned ON, and the shift position is changed to N position.
- VCM group*: except for A
When the charging connector is connected to the charge port, the shift position remains in P position even when the selector lever knob is operated with the power switch ON.

*: For VCM groups, refer to [EVC-8, "How to Check VCM Group"](#).

Charge Mode

Charge mode		Remaining charge level	Time required for charge (at 25°C)
Normal charge mode	Immediate charge	100%*1	<Reference information> AC 200 V: Approx. 8 hours AC 100 V: Approx. 28 hours (Charging from Li-ion battery available charge level low*4 to 100%)
	Timer charge	80% or 100%*1 (selectable)	
	Remote charge	100%*1	
Quick charge mode		Remaining battery*3 at the start of charging is less than 50%: 90%*2 Remaining battery*3 at the start of charging is 50% or more: 100%*1 NOTE: When the specified time lapses, charging stops if charge level is not sufficient.	Approx. 30 minutes (Charging from Li-ion battery available charge level low*4 to 80%*3)

*1: Remaining charge level may not reach 100%, depending on battery condition.

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

*3: This means the battery level indicated on quick charger.

*4: Low battery charge lamp illuminates.

Normal Charge Mode (Immediate Charge)

Normal charge mode (immediate charge) immediately starts charging when EVSE is connected. When timer charge is not set, charging is immediately started when the charge connector is connected to the charge port. When timer charge is set, immediate charge mode is selected after the immediate charging switch is pressed.

Normal Charge Mode (Timer Charge)

Normal charge mode (timer charge) starts/stops charging by the timer set in VCM. Charge level can be set to 80% or 100%.

Normal Charge Mode (Remote Charge)

Normal charge mode (remote charge) starts charging by remote control with mobile tool.

Quick Charge Mode

SYSTEM

< SYSTEM DESCRIPTION >

Quick charge mode performs charging with quick charger. Maximum charge level varies depending on the remaining level of the Li-ion battery at the start of charging. When charging is not completed and the charge time set on the quick charger or the time out (approximately 60 minutes) set on the vehicle elapses, charging stops.

NOTE:

If charging stops before charging is complete, additional charging by quick charge can be performed again.

Circuit Diagram

INFOID:000000007633995

For information regarding the circuit diagram, refer to [EVC-28, "ELECTRIC POWER TRAIN SYSTEM : Circuit Diagram"](#).

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STRUCTURE AND OPERATION

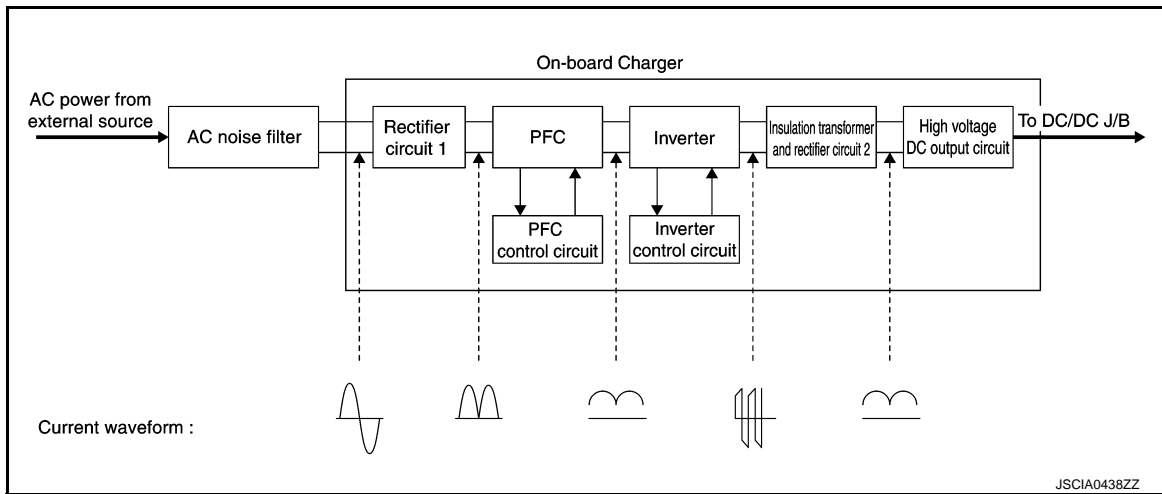
< SYSTEM DESCRIPTION >

STRUCTURE AND OPERATION

On-board Charger

INFOID:000000007633996

OPERATION PRINCIPLE



1. AC power which is externally given is rectified to DC power with rectifier circuit 1.
2. The voltage of the rectified DC power is boosted during the power factor improvement in the PFC circuit.
3. The voltage-boosted DC power is converted back to AC power with the inverter.
4. The AC power from the converter is boosted by the insulated transformer and is rectified to high-voltage DC power by rectifier circuit 2.
5. The rectified high-voltage DC power is output by the output circuit.

NOTE:

PFC (Power Factor Correction) circuit is a power factor improvement circuit. It is a device for converting AC power (input from external source) to DC power efficiently.

HANDLING PRECAUTION

< SYSTEM DESCRIPTION >

HANDLING PRECAUTION

Li-ion Battery Charging System

INFOID:000000007633997



HANDLING OF CHARGE CABLE, CHARGE PORT AND CHARGE CONNECTOR

- Never touch metal terminals of the charge port or the charge connector.
- Never modify or disassemble charge cable, charge connector, or charge port.
- Never apply excessive force to the charge cable.
 - Never pull.
 - Never twist.
 - Never drag.
- Never place a heavy item on charge cable.
- Never place near a heating device (heater, etc.).
- Never drop or subject to strong impact.
- Securely put the cap on the connector to store.
- To store charge cable, and charge connector, place them in the place free from direct sunlight, weather-damage, dirt, and dust.


PRECAUTIONS FOR CHARGING

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

WARNING:

-  Since there may be risk of electric shock, never touch the charge connector or charge port if they contain foreign material.
-  Since there may be risk of electric shock or electric leakage, never connect the charge connector or charge port if they contain foreign material.
- Never use worn or damaged (e.g. exposed cable conductor) EVSE cords and cables.
- Never use worn or damaged (scratches or cracks) EVSE connector, control box, and plug.
- Check that there is no rust, corrosion or damage on the charge port or charge connector. Check that there is no looseness at the time of connection.

WARNING:

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

NOTE:

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

NOTE:

- When the charge connector is connected to the charge port, READY is disabled.
- To prevent electric shock or fire arising from electric leakage, use a waterproof plug with grounding connected to the ground fault interrupter.
- Never connect to outlets other than rated voltage outlet.
- For charging, never use a generator or any other power source other than specified.

NOTE:

- Charging may not be performed correctly or a malfunction may occur.
- When quick charging is performed, be sure to use a quick charger compatible with the vehicle.

ON BOARD DIAGNOSTIC (OBD) SYSTEM

< SYSTEM DESCRIPTION >

ON BOARD DIAGNOSTIC (OBD) SYSTEM

Diagnosis Description

INFOID:000000007633998

This system is an on board diagnostic system that detects a malfunction automatically. A malfunction is stored in ECU memory as a DTC. The diagnostic information can be obtained with CONSULT.

Counter System

INFOID:000000007633999

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

DTC and Freeze Frame Data

INFOID:000000007634000

The on-board charger can save multiple DTC but can only save one freeze frame data.

After the on-board charger has detected a malfunction and saves the DTC and freeze frame data, if a different malfunction is detected, multiple DTC are confirmed, but only the freeze frame data that is saved first can be confirmed.

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

DIAGNOSIS SYSTEM (ON-BOARD CHARGER)

< SYSTEM DESCRIPTION >

DIAGNOSIS SYSTEM (ON-BOARD CHARGER)

CONSULT Function

INFOID:000000007634001

FUNCTION

Diagnostic test mode	Function
ECU Identification	On-board charger part number can be read.
Self-diagnostic result	Self-diagnostic results and freeze frame data can be read and erased quickly.*
Data monitor	Input/Output data in the on-board charger can be read.
Active test	Operable under the condition that the actuator is activated by CONSULT via the on-board charger or within the range that a (some of) command value is designated.

*: The following diagnosis information is cleared when the on-board charger memory is erased.

- Diagnostic trouble codes
- Freeze frame data

SELF-DIAG RESULTS MODE

Self Diagnostic Item

- Regarding items of DTC, refer to [VC-27. "DTC Index"](#).
- Regarding items of DTC sub type, refer to [VC-28. "DTC Sub Type Index"](#).

IGN Counter

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

- CAN malfunction (U1000)
 - The number is 0 when a malfunction is detected now.
 - The displayed number counts up at each operation of power switch from OFF to ON after recovery to normal, such as 1 → 2 → 3...38 → 39.
 - The number is fixed to 39 until the self-diagnosis results are erased if it is over 39.
- Other than CAN malfunction (Other than U1000)
 - The number is 0 when a malfunction is detected now.
 - The displayed number counts up at each operation of power switch from OFF to ON after recovery to normal, such as 1 → 2 → 3...254 → 255.
 - The number is fixed to 255 until the self-diagnosis results are erased if it is over 255.

Freeze Frame Data

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

Freeze Frame Data Item List

Freeze frame data item	Description
Q/CHG CONNECT DETECT	Displays the connection status of the quick charge connector.
Q/CHG START/STOP SIG 1	Displays the input status of the charge start/stop signal 1 from the quick charger.
Q/CHG START/STOP SIG 2	Displays the input status of the charge start/stop signal 2 from the quick charger.
QUICK CHARGE PERMIT	Displays the transmitting status of the charge start permission signal being sent to the quick charger.
N/CHG RELAY +	Displays the control status of the normal charge relay (+).
N/CHG RELAY -	Displays the control status of the normal charge relay (-).
Q/CHG RELAY +	Displays the control status of the quick charge relay (+).
Q/CHG RELAY -	Displays the control status of the quick charge relay (-).
EVSE SIGNAL PULSE WIDTH [μs]	Displays the pulse width of the PWM signal being sent from the EVSE.
PWM SIGNAL	Displays the reception status of the PWM signal being sent from the EVSE.
AC INPUT VOLTAGE [V]	Displays AC input power voltage.
N/CHG CONNECT STATUS	Displays the engagement detection status of the EVSE charge connector.

DIAGNOSIS SYSTEM (ON-BOARD CHARGER)

< SYSTEM DESCRIPTION >

Freeze frame data item	Description
QUICK CHARGE VOLT SENSOR [V]	Displays the signal voltage of the quick charge voltage sensor.
ON BOARD CHARGER TEMP [degC]	Displays the on-board charger internal temperature.
Q/CHG PORT TEMP	Displays the quick charge port temperature status.
VCM ACTIVAT REQ	Displays the send status of the EV system activation request signal to the VCM.
PWM SIGNAL VOLTAGE [V]	Displays the voltage of a PWM signal transmitted from EVSE.
CHG CONNECT DETECT V [V]	Displays the signal voltage of the engagement detection circuit of the EVSE charge connector.
TIME	Displays the number of DTC detected trips.
ELAPSED TIME	Displays the time elapsed since the detection of the DTC.

DATA MONITOR MODE

Monitored Item

MONITOR ITEM	Unit	Description
Q/CHG CONNECT DETECT	CNCT/DIS-CNCT	Displays the connection status of the quick charge connector. <ul style="list-style-type: none"> • CNCT: The quick charge connector is connected. • DISCNCT: The quick charge connector is not connected.
Q/CHG START/STOP SIG 1	OPEN/HIGH	Displays the input status of the charge start/stop signal 1 from the quick charger. <ul style="list-style-type: none"> • OPEN: The quick charger start switch is OFF and not under quick charge. • HIGH: The quick charger start switch ON or under quick charge.
Q/CHG START/STOP SIG 2	OPEN/LOW	Displays the input status of the charge start/stop signal 2 from the quick charger. <ul style="list-style-type: none"> • OPEN: Isolation check with a quick charger is NG or not completed. • LOW: Isolation check with a quick charger completed normally.
QUICK CHARGE PERMIT	LOW/HIGH	Displays the transmission status of the charge start permission signal being sent to the quick charger. <ul style="list-style-type: none"> • LOW: Allow quick charge start • HIGH: Quick charge start is not allowed
N/CHG RELAY +	On/Off	Displays the normal charge relay (+) control status. <ul style="list-style-type: none"> • On: Normal charge relay (+) is ON. • Off: Normal charge relay (+) is OFF.
N/CHG RELAY -	On/Off	Displays the control status of the normal charge relay (-). <ul style="list-style-type: none"> • On: Normal charge relay (-) is ON. • Off: Normal charge relay (-) is OFF.
Q/CHG RELAY +	On/Off	Displays the control status of the quick charge relay (+). <ul style="list-style-type: none"> • On: Quick charge relay (+) is ON. • Off: Quick charge relay (+) is OFF.
Q/CHG RELAY -	On/Off	Displays the control status of the quick charge relay (-). <ul style="list-style-type: none"> • On: Quick charge relay (-) is ON. • Off: Quick charge relay (-) is OFF.
EVSE SIGNAL PULSE WIDTH	μs	Displays the pulse width of the PWM signal being sent from the EVSE.
PWM SIGNAL	OK/NONE	Displays the reception status of the PWM signal being sent from the EVSE. <ul style="list-style-type: none"> • OK: Communicating normally. • NONE: Not communicating
AC INPUT VOLTAGE	V	Displays AC input power voltage.
N/CHG CONNECT STATUS	NONE/ CNCT/ INPUT	Displays the engagement detection status of the normal charge connector. <ul style="list-style-type: none"> • NONE: The charge connector is not engaged or there is no PWM communication from the EVSE. • CNCT: There is no AC input in the charge connector connected status. • INPUT: There is AC input in the charge connector connected status.
QUICK CHARGE VOLT SENSOR	V	Displays the signal voltage of the quick charge voltage sensor.
ON BOARD CHARGER TEMP	degC	Displays the on-board charger internal temperature.

DIAGNOSIS SYSTEM (ON-BOARD CHARGER)

< SYSTEM DESCRIPTION >

MONITOR ITEM	Unit	Description
VCM ACTIVAT REQ	LOW/HIGH	Displays the send status of the EV system activation request signal to the VCM. <ul style="list-style-type: none"> • HIGH: EV system start is being requested. • LOW: EV system start is not being requested.
Q/CHG PORT TEMP	OK/NG	Displays the quick charge port temperature status. <ul style="list-style-type: none"> • OK: Normal • NG: Temperature is high
PWM SIGNAL VOLTAGE	V	Displays the voltage of a PWM signal transmitted from EVSE.
CHG CONNECT DETECT V	V	Displays the signal voltage of the engagement detection circuit of the normal charge connector.

ACTIVE TEST MODE

Test item

TEST ITEM	CONDITION	JUDGEMENT	CHECK ITEM (READY)
Q/CHG RELAY +	<ul style="list-style-type: none"> • Power switch ON • Use active test to turn ON/OFF the quick charge relay. 	Check that the quick charge relay makes the operating sound.*	<ul style="list-style-type: none"> • Harness and connector • Quick charge relay (+) • On-board charger
Q/CHG RELAY -	<ul style="list-style-type: none"> • Power switch ON • Use active test to turn ON/OFF the quick charge relay. 	Check that the quick charge relay makes the operating sound.*	<ul style="list-style-type: none"> • Harness and connector • Quick charge relay (-) • On-board charger
N/CHG RELAY +	<ul style="list-style-type: none"> • Power switch ON • Use active test to turn ON/OFF the normal charge relay. 	Check that the normal charge relay makes the operating sound.*	<ul style="list-style-type: none"> • Harness and connector • Normal charge relay (+) • On-board charger
N/CHG RELAY -	<ul style="list-style-type: none"> • Power switch ON • Use active test to turn ON/OFF the normal charge relay. 	Check that the normal charge relay makes the operating sound.*	<ul style="list-style-type: none"> • Harness and connector • Normal charge relay (-) • On-board charger
QUICK CHARGE PERMIT	Quick charge permit signal is forcibly output.	Check continuity between on-board charger connector terminals to check that the transistor included in the on-board charger is ON.	On-board charger

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

ON BOARD CHARGER

< ECU DIAGNOSIS INFORMATION >

ECU DIAGNOSIS INFORMATION

ON BOARD CHARGER

Reference Value

INFOID:000000007634002

VALUES ON THE DIAGNOSIS TOOL

Specification data represents reference values.

NOTE:

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

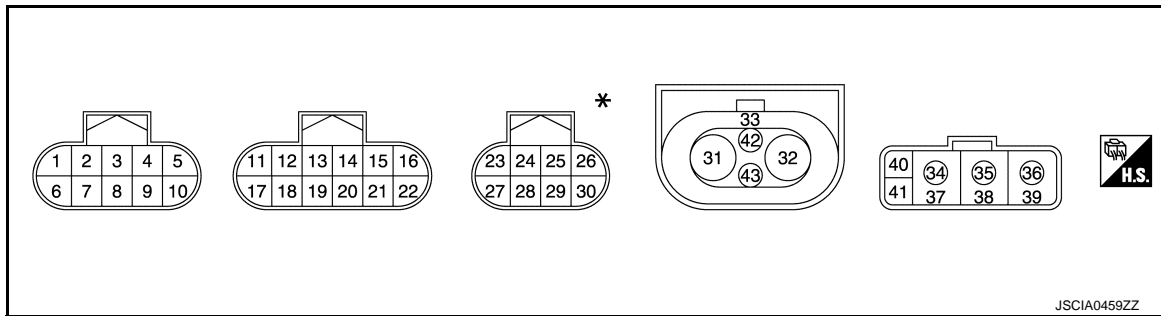
MONITOR ITEM	CONDITION	Values/Status	
Q/CHG CONNECT DETECT	POWER ON	Quick charging connector: Connected	CNCT
		Quick charging connector: Not connected	DISCNCT
Q/CHG START/STOP SIG 1	The quick charger start switch is OFF and not under quick charge.		OPEN
	The quick charger start switch ON or under quick charge.		HIGH
Q/CHG START/STOP SIG 2	In the process of quick charge after the normal completion of insulation resistance check.		LOW
	For a few seconds after turning ON the quick charger start switch.		OPEN
QUICK CHARGE PERMIT	Quick charger start switch is OFF. Not in process of quick charge.		HIGH
	A lapse of a few seconds after turning ON the quick charger start switch.		HIGH⇒LOW
N/CHG RELAY +	Normal charging in progress		On
	Not normal charging		Off
N/CHG RELAY -	Normal charging in progress		On
	Not normal charging		Off
Q/CHG RELAY +	Quick charging in progress		On
	Not quick charging		Off
Q/CHG RELAY -	Quick charging in progress		On
	Not quick charging		Off
EVSE SIGNAL PULSE WIDTH	AC power: 12 A		220 μs (Approx.)
	AC power: 16 A		250 μs (Approx.)
	AC power: 30 A		500 μs (Approx.)
PWM SIGNAL	Normal charging in progress		OK
	Except above		NONE
AC INPUT VOLTAGE	Indicates AC input power voltage.		
N/CHG CONNECT STATUS	Normal charging in progress		INPUT
	When the EVSE charge connector is not connected		NONE
QUICK CHARGE VOLT SENSOR	Power switch: ON		0 V
	During quick charging		4 V (Approx.)

ON BOARD CHARGER

< ECU DIAGNOSIS INFORMATION >

MONITOR ITEM	CONDITION	Values/Status
ON BOARD CHARGER TEMP	Depending on the on board charger temperature.	-40 – 215°C Indicates depending on the on board charger temperature.
VCM ACTIVAT REQ	Immediately after EVSE is connected	LOW⇒HIGH⇒LOW
Q/CHG PORT TEMP	When the quick charge port is abnormally hot	NG
	Except above	OK
PWM SIGNAL VOLTAGE	Normal charge	4 – 7 V
CHG CONNECT DETECT V	When the EVSE charge connector is connected	0.747 – 2.129 V
	When the EVSE charge connector is not connected	5.0 V

TERMINAL LAYOUT



*: With quick charge port

PHYSICAL VALUES

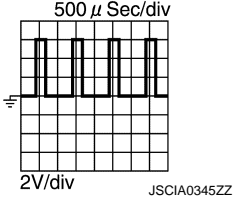
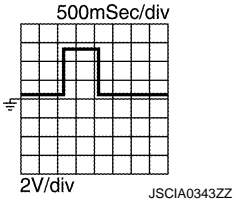
NOTE:

Specification data are reference values.

Terminal No. (Wire color)		Description	Input/ Output	Condition	Value (Approx.)
+	-				
1 (P)	22 (B)	Quick charge start/stop1 signal	Input	During quick charging	6.5 V or more ^{*1}
				Except above	0 V
2 (SB)	22 (B)	Quick charge start/stop2 signal	Input	After turning ON the quick charge start button.	6.5 V or more ^{*1} ⇒0 V
3 (Y)	22 (B)	Quick charger connection signal	Input	Quick charge connector is connect- ed.	1.5 V or less
				Quick charge connector is not connect- ed.	12V battery voltage
4 (G)	22 (B)	Quick charge permit sig- nal	Output	During quick charging	0 V
5 (BR)	—	Ground	—	—	—
6 (L)	—	Quick charger communi- cation-H (CAN)	Input/ Output	—	—
7 (B)	—	Quick charger communi- cation-L (CAN)	Input/ Output	—	—

ON BOARD CHARGER

< ECU DIAGNOSIS INFORMATION >

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	-	Signal name	Input/ Output		
9 (LG)	22 (B)	EVSE communication (PWM)	Input	Immediately after normal charge connector is connected.	12 V → 9 V (Approx.)
				During normal charging	
10 (W)	22 (B)	EVSE connection signal	Input	Normal charge connector is normally connected.	0.747 – 2.129 V
				Normal charge connector is not connected.	5.0 V
11 (Y)	Ground	Battery power supply	Input	Always	12V battery voltage
12 (W)	Ground	Battery power supply	Input	Power switch: ON	12V battery voltage
13 (V)	Ground	POWER ON power supply	Input	Power switch: ON	12V battery voltage
14 (P)	Ground	Normal charge relay (+) power supply	Output	Normal charge relay: Operating	Less than 1 V
				Except above	M/C relay power supply
15 (LG)	Ground	Normal charge relay (-) power supply	Output	Normal charge relay: Operating	Less than 1 V
				Except above	M/C relay power supply
16 (L)	Ground	Quick charge relay (+) power supply	Output	Quick charge relay: Operating	Less than 1 V
				<ul style="list-style-type: none"> • Quick charge relay: Not operating • F/S CHG relay: Operating 	F/S CHG relay power supply
17 (SB)	Ground	Quick charge relay (-) power supply	Output	Quick charge relay: Operating	Less than 1 V
				<ul style="list-style-type: none"> • Quick charge relay: Not operating • F/S CHG relay: Operating 	F/S CHG relay power supply
18 (GR)	22 (B)	EV system activation request signal	Output	Immediately after EVSE is connected	
19 (L)	—	EV system CAN-H	—	—	—
20 (G)	—	EV system CAN-L	—	—	—
21 (BR)	Ground	Plug in signal	Output	Charging connector is connected.	3 V (Approx.)
				Charging connector is not connected.	12V battery voltage
22 (B)	—	Ground	—	—	—

ON BOARD CHARGER

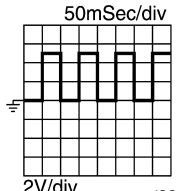
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Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	-	Signal name	Input/ Output		
25 (W)	22 (B)	Quick charge port temperature sensor*2 signal 1	Input	Quick charge port temperature: 24°C	0.26 – 0.49 V
				Quick charge port temperature: 50°C	0.32 – 0.68 V
26 (GR)	22 (B)	Quick charge port temperature sensor*2 signal 2	Input	Quick charge port temperature: 24°C	0.26 – 0.49 V
				Quick charge port temperature: 50°C	0.32 – 0.68 V
27 (R)	22 (B)	Quick charge voltage sensor*3 signal-L	Input	During quick charging	0.5 V or less
				Except above	2.5 V (Approx.)
28 (Y)	22 (B)	Sensor power supply (Quick charge voltage sensor*3)	Output	In Quick Charging	5 V (Approx.)
29 (G)	—	Sensor ground (Quick charge voltage sensor*3)	—	—	—
30 (V)	22 (B)	Quick charge voltage sensor*3 signal-H	Input	During quick charging	4.5 V or more
				Except above	2.5 V (Approx.)
40 (O)	Ground	High voltage harness connection detecting circuit power supply	Output	Power switch: ON	
41 (O)	Ground	High voltage harness connection detecting circuit signal	Input	When the high voltage harness of normal charge port is connected.	
				When the high voltage harness of normal charge port is not connected.	2.5 V (Approx.)
42	Ground	High voltage harness connection detecting circuit power supply	Output	Power switch: ON	

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ON BOARD CHARGER

< ECU DIAGNOSIS INFORMATION >

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	-	Signal name	Input/ Output		
43	Ground	High voltage harness connection detecting circuit signal	Input	When the high voltage harness (DC side) is connected.	 <small>JSCIA0386ZZ</small>
				When the high voltage harness (DC side) is not connected.	

*1: The voltage changes depending on Quick charger.

*2: Quick charge port temperature sensor is built into the quick charge port.

*3: Quick charge voltage sensor is built into the DC/DC junction box.

Fail-Safe

INFOID:000000007634003

FAIL-SAFE

When there is a malfunction with the on-board charger, charging is stopped as a fail-safe.

FAIL-SAFE LIST

x:Applicable —: Not applicable

DTC	Items (CONSULT screen terms)	Sub type (CONSULT screen terms)	Fail-safe
B2801	Q/CHG ACTIVATION SIG ERROR	SIGNAL INVALID	x
B2802	Q/CHG ISOLATION SIGNAL ERROR	SIGNAL STUCK LOW	x
		SIGNAL STUCK HIGH	x
B2803	Q/CHG PERMIT SIGNAL ERROR	SIGNAL STUCK LOW	x
B2813	ON BOARD CHARGER	SIGNAL STUCK LOW	x
B2814	ON BOARD CHARGER	SIGNAL STUCK HIGH	x
B2820	QUICK CHARGER	—	x
B2821	12V POWER SUPPLY	SIGNAL STUCK LOW	—
		SIGNAL STUCK HIGH	—
B2827	NORMAL CHARGE RELAY	SIGNAL STUCK LOW	x
B2830	QUICK CHARGE VOLTAGE SENSOR	CMPNENT INTERNAL MLFNCTN	x
B2840	ON BOARD CHARGER	ELECTRICAL MALFUNCTION	x
		PARAMETRIC	x
		CMPNENT INTERNAL MLFNCTN	x
		COMPONENT/SYS OVER TEMP	x
B2850	OBC TEMP SENSOR	SIGNAL STUCK HIGH	x
		SIGNAL INVALID	x
B2880	F/S CHG RELAY	SIGNAL STUCK LOW	x
		SIGNAL STUCK HIGH	x
B28A0	NORMAL CHARGE INTERLOCK (AC)	SIGNAL STUCK HIGH	x
B28B0	NORMAL CHARGE INTERLOCK (DC)	SIGNAL STUCK HIGH	x
B2900	ON BOARD CHARGER	PROGRAM MEMORY ERROR	x
		DATA MEMORY ERROR	x
B2902	ON BOARD CHARGER	MEMORY ERROR	x

ON BOARD CHARGER

< ECU DIAGNOSIS INFORMATION >

DTC	Items (CONSULT screen terms)	Sub type (CONSULT screen terms)	Fail-safe
B2980	QUICK CHARGE PORT TEMP	SIGNAL STUCK HIGH	×
		COMPONENT/SYS OVER TEMP	×
B29A0	N/CHG PORT ENGAGEMENT ERROR	SIGNAL STUCK HIGH	×
		SIGNAL INVALID	×
B29C1	EVSE	SIGNAL STUCK LOW	×
		SIGNAL STUCK HIGH	×
		SIGNAL INVALID	×
		NO SIGNAL	×
		UNEXPECTED OPERATION	×
U1000	CAN COMM CIRCUIT	MISSING MESSAGE	×
		ERRATIC	×
U1008	QUICK CHARGER COMM	MISSING MESSAGE	×
		ERRATIC	×
U100A	CAN COMM ERROR	MISSING MESSAGE	×
U100B	QUICK CHARGER COMM	MISSING MESSAGE	×
U1010	CONTROL UNIT (CAN)	INTERNAL ELECTRIC MALFNCTN	×

DTC Index

INFOID:000000007634004

×:Applicable —: Not applicable

DTC	Items (CONSULT screen terms)	Sub type (CONSULT screen terms)	EV system warning lamp	Trip	Reference page
U1000	CAN COMM CIRCUIT	MISSING MESSAGE	×	1	VC-41
		ERRATIC	×	1	VC-41
U1008	QUICK CHARGER COMM	MISSING MESSAGE	×	1	VC-42
		ERRATIC	×	1	VC-42
U100A	CAN COMM ERROR	MISSING MESSAGE	×	1	VC-45
U100B	QUICK CHARGER COMM	MISSING MESSAGE	×	1	VC-42
U1010	CONTROL UNIT (CAN)	INTERNAL ELECTRIC MALFNCTN	×	1	VC-46
B2801	Q/CHG ACTIVATION SIG ERROR	SIGNAL INVALID	×	1	VC-47
B2802	Q/CHG ISOLATION SIGNAL ER- ROR	SIGNAL STUCK LOW	×	1	VC-51
		SIGNAL STUCK HIGH	×	1	VC-51
B2803	Q/CHG PERMIT SIGNAL ERROR	SIGNAL STUCK LOW	—	1	VC-54
B2813	ON BOARD CHARGER	SIGNAL STUCK LOW	×	1	VC-56
B2814	ON BOARD CHARGER	SIGNAL STUCK HIGH	×	1	VC-57
B2820	QUICK CHARGER	—	—	1	VC-58
B2821	12V POWER SUPPLY	SIGNAL STUCK LOW	×	1	VC-59
		SIGNAL STUCK HIGH	×	1	VC-59
B2827	NORMAL CHARGE RELAY	SIGNAL STUCK LOW	×	1	VC-60
B2830	QUICK CHARGE VOLTAGE SEN- SOR	CMPNENT INTERNAL MLFNCTN	×	1	VC-63

ON BOARD CHARGER

< ECU DIAGNOSIS INFORMATION >

DTC	Items (CONSULT screen terms)	Sub type (CONSULT screen terms)	EV system warning lamp	Trip	Reference page
B2840	ON BOARD CHARGER	ELECTRICAL MALFUNCTION	×	1	VC-69
		PARAMETRIC	×	1	VC-69
		CMPNENT INTERNAL MLFNCTN	×	1	VC-69
		COMPONENT/SYS OVER TEMP	×	1	VC-69
B2850	OBC TEMP SENSOR	SIGNAL STUCK HIGH	×	1	VC-72
		SIGNAL INVALID	×	1	VC-72
B2880	F/S CHG RELAY	SIGNAL STUCK LOW	×	1	VC-74
		SIGNAL STUCK HIGH	×	1	VC-74
B28A0	NORMAL CHARGE INTERLOCK (AC)	SIGNAL STUCK HIGH	×	1	VC-79
B28B0	NORMAL CHARGE INTERLOCK (DC)	SIGNAL STUCK HIGH	×	1	VC-82
B2900	ON BOARD CHARGER	PROGRAM MEMORY ERROR	×	1	VC-84
		DATA MEMORY ERROR	×	1	VC-84
B2902	ON BOARD CHARGER	MEMORY ERROR	×	1	VC-84
B2980	QUICK CHARGE PORT TEMP	SIGNAL STUCK HIGH	×	1	VC-85
		COMPONENT/SYS OVER TEMP	×	1	VC-85
B29A0	N/CHG PORT ENGAGEMENT ER- ROR	SIGNAL STUCK HIGH	×	1	VC-88
		SIGNAL INVALID	—	1	VC-88
B29C1	EVSE	SIGNAL STUCK LOW	×	1	VC-91
		SIGNAL STUCK HIGH	×	1	VC-91
		NO SIGNAL	×	1	VC-91
		UNEXPECTED OPERATION	× or —	1	VC-91
		SIGNAL INVALID	×	1	VC-91

DTC Sub Type Index

INFOID:000000007634005

Items (CONSULT screen terms)	Description	Remarks
ELECTRICAL MALFUNCTION	Electrical Malfunction	
SIGNAL STUCK LOW	Signal Stuck Low	
SIGNAL STUCK HIGH	Signal Stuck High	
SIGNAL INVALID	Signal Invalid	
NO SIGNAL	No Signal	
MEMORY ERROR	General Memory Error	
DATA MEMORY ERROR	Data Memory Error	
PROGRAM MEMORY ER- ROR	Program Memory Error	
INTERNAL ELECTRIC MALFNCTN	Internal Electronic malfunction	
INCRRCT COMPNT IN- STALLED	Incorrect Component Installed	
OVER TEMPERATURE	Over Temperature	

ON BOARD CHARGER

< ECU DIAGNOSIS INFORMATION >

Items (CONSULT screen terms)	Description	Remarks	
ALIV/CNT INCRCT/NOT UPDAT	Alive / Sequence Counter Incorrect / Not Updated	This sub type is used by the control module to indicate that a signal was received without the corresponding rolling count value being properly updates.	A B
SIG PRTCTN CLCLTN IN-CRCT	Value of Signal Protection Calculation Incorrect	This sub type is used by the control module to indicate, that a message was processed with an incorrect protection (checksum) calculation.	VC
MISSING MESSAGE	Missing Message	This sub type is used for malfunctions where one (or more) expected message(s) is not received.	D
ERRATIC	Erratic	This sub type is used for malfunctions where the serial data, is momentarily implausible or discontinuous.	E
PARAMETRIC	Parametric malfunction		
NO OPERATION	No Operation		F
UNEXPECTED OPERATION	Unexpected Operation		
CMPNENT INTERNAL MLFNCTN	Component Internal malfunction		G
COMPONENT/SYS OVER TEMP	Component or System Over Temperature		H
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			P

ON BOARD CHARGER


< WIRING DIAGRAM >

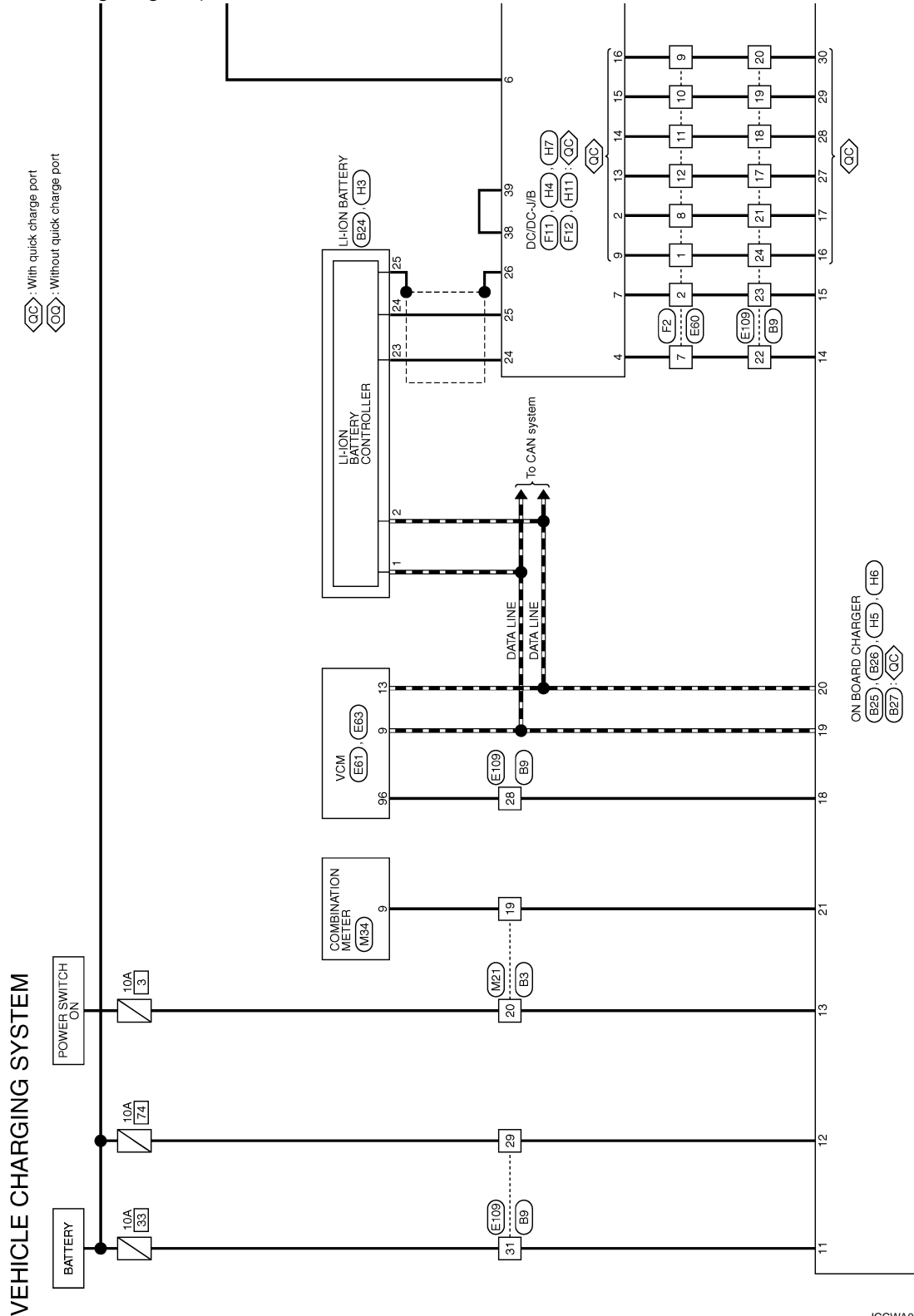
WIRING DIAGRAM

ON BOARD CHARGER

Wiring Diagram

INFOID:000000007634006

For connector terminal arrangements, harness layouts, and alphabets in a  (option abbreviation; if not described in wiring diagram), refer to [GI-12, "Connector Information"](#).

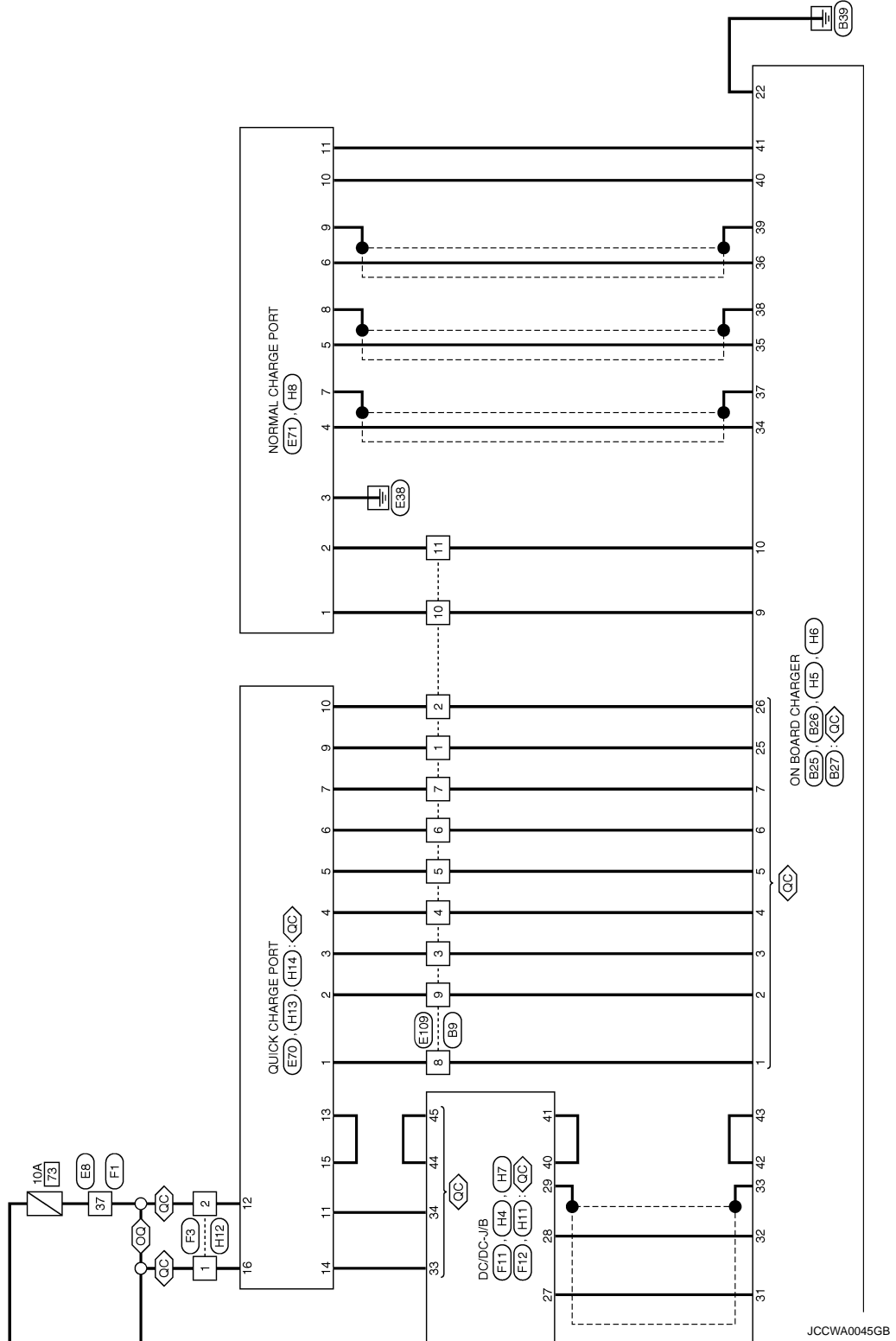


2010/10/29

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ON BOARD CHARGER

< WIRING DIAGRAM >



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DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

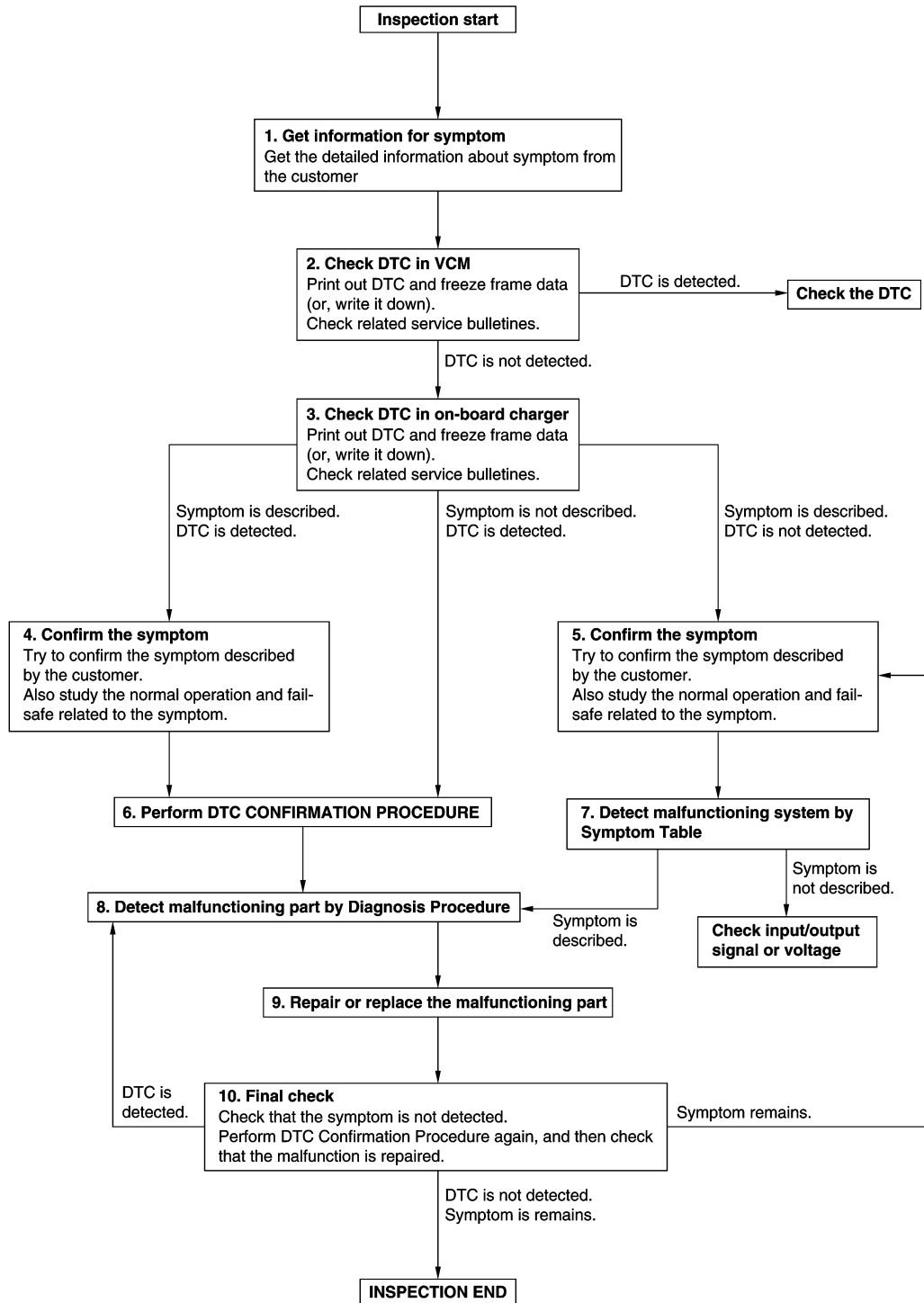
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:000000007634007

OVERALL SEQUENCE



JSCIA0368GB

DETAILED FLOW

Revision: 2014 June

VC-32

2012 LEAF

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

1.GET INFORMATION FOR SYMPTOM

Get the detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred) using the "Diagnostic Work Sheet". (Refer to [VC-34, "Diagnostic Work Sheet"](#).)

>> GO TO 2.

2.CHECK DTC IN VCM

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

Are any DTCs detected?

- YES >> Check the DTC. Refer to [EVC-84, "DTC Index"](#).
NO >> GO TO 3.

3.CHECK DTC IN ON-BOARD CHARGER

1. Check DTC in on-board charger.
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-347, "Symptom Index"](#).)
3. Check related service bulletins for information.

Are any symptoms described and any DTCs detected?

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

4.CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer.
Also study the normal operation and fail-safe related to the symptom. Refer to [VC-100, "Symptom Table"](#) and [VC-26, "Fail-Safe"](#).
Diagnosis Work Sheet is useful to verify the incident.
Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 6.

5.CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer.
Also study the normal operation and fail-safe related to the symptom. Refer to [VC-100, "Symptom Table"](#) and [VC-26, "Fail-Safe"](#).
Diagnosis Work Sheet is useful to verify the incident.
Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 7.

6.PERFORM DTC CONFIRMATION PROCEDURE

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

NOTE:

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

Is DTC detected?

- YES >> GO TO 8.

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

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

7. DETECT MALFUNCTIONING SYSTEM BY SYMPTOM TABLE

Detect malfunctioning system according to [EVC-347, "Symptom Index"](#) based on the confirmed symptom in step 4, and determine the trouble diagnosis order based on possible causes and symptoms.

Is the symptom described?

YES >> GO TO 8.

NO >> Monitor input data from related sensors or check voltage of related on-board charger terminals using CONSULT. Refer to [VC-22, "Reference Value"](#).

8. DETECT MALFUNCTIONING PART BY DIAGNOSIS PROCEDURE

Inspect according to Diagnosis Procedure of the system.

Is a malfunctioning part detected?

YES >> GO TO 9.

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

9. REPAIR OR REPLACE THE MALFUNCTIONING PART

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

>> GO TO 10.

10. FINAL CHECK

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

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

Is DTC detected and does symptom remain?

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

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

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

Diagnostic Work Sheet

INFOID:000000007634008

DESCRIPTION

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

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

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

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

NOTE:

Some conditions may cause a DTC to be detected.

DIAGNOSTIC WORKSHEET

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

Diagnostic worksheet				
Customer name		License plate No.		Date of first registration
		Model		
Acceptance Date		VIN	Mileage	km (mile)

Question	Group	Information from the customer			
Vehicle condition at malfunction occurrence	R/Q/N/O	<input type="checkbox"/> READY (R) <input type="checkbox"/> Quick charge (Q) <input type="checkbox"/> Normal charge (N) <input type="checkbox"/> Others (O)			
Symptom	R	<input type="checkbox"/> "READY" not enabled <input type="checkbox"/> Poor drivability <input type="checkbox"/> Shock <input type="checkbox"/> Vibration <input type="checkbox"/> Driving impossible <input type="checkbox"/> Noise <input type="checkbox"/> Poor shifting <input type="checkbox"/> Poor braking <input type="checkbox"/> Poor acceleration <input type="checkbox"/> Low electricity consumption <input type="checkbox"/> Switch malfunction <input type="checkbox"/> Warning lamp ON <input type="checkbox"/> Others (_____)			
		Details of symptom			
		Information display indication			
		Electricity consumption	km (mile)/kW		
		Li-ion battery remaining energy	/		
	Q, N	<input type="checkbox"/> Charging unable <input type="checkbox"/> Charging discontinued <input type="checkbox"/> Slow charging <input type="checkbox"/> Poor timer charging <input type="checkbox"/> Poor remote charging <input type="checkbox"/> Immediate charging unable <input type="checkbox"/> Others (_____)			
		Details of symptom			
		Quick charger monitor indication			
	O	<input type="checkbox"/> A/C inoperative <input type="checkbox"/> Poor A/C <input type="checkbox"/> Dead 12V battery <input type="checkbox"/> Others (_____)			
		Details of symptom			
	Location/status of occurrence	R/O	<input type="checkbox"/> Not applicable <input type="checkbox"/> Ordinary road <input type="checkbox"/> Highway <input type="checkbox"/> Mountain pass <input type="checkbox"/> Rough road <input type="checkbox"/> Level road <input type="checkbox"/> Uphill <input type="checkbox"/> Downhill <input type="checkbox"/> Left/right turn <input type="checkbox"/> Others (_____)		
		Q/N/O	<input type="checkbox"/> Start of charge <input type="checkbox"/> During charging <input type="checkbox"/> After the end of charging <input type="checkbox"/> During standby of timer charging <input type="checkbox"/> During timer charging <input type="checkbox"/> At the end of timer charging <input type="checkbox"/> During remote charging <input type="checkbox"/> Others (_____)		
Driving condition	R	<input type="checkbox"/> At the system startup <input type="checkbox"/> During READY (Vehicle stopped) <input type="checkbox"/> At start <input type="checkbox"/> During acceleration <input type="checkbox"/> During driving with a constant speed <input type="checkbox"/> During coasting <input type="checkbox"/> During braking <input type="checkbox"/> Right before stopping <input type="checkbox"/> Right after stopping <input type="checkbox"/> During POWER OFF operation <input type="checkbox"/> A/C ON <input type="checkbox"/> During shift change <input type="checkbox"/> Others (_____)			
		Vehicle speed	km (MPH)		
		Accelerator pedal opening angle	/ 8		

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CHARGE PORT

< PERIODIC MAINTENANCE >

PERIODIC MAINTENANCE

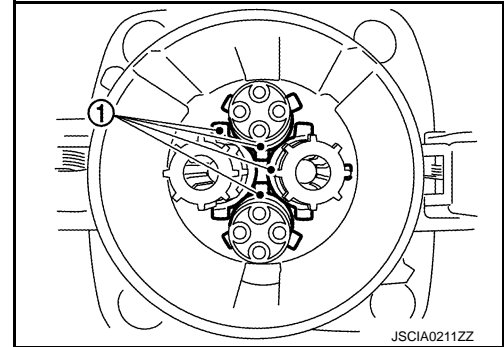
CHARGE PORT

Inspection

INFOID:000000007634009

Inspection method

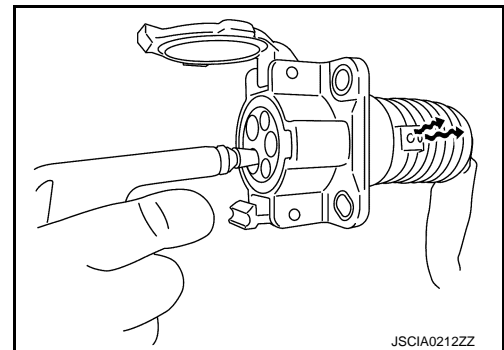
1. Visually and tactually check for the items listed below:
 - Cracks in the packing (1) of quick charge port



- Dust and foreign matter in the quick charge port and normal charge port
 - Damage in the quick charge port and normal charge port
 - Malfunction in opening/closing the charge port caps and looseness when closed and locked.
2. Check the inside of rubber cap.
Blow air to the normal charge port to check that air exits through the rubber cap hole located on the back of the port.

NOTE:

- This inspection must be performed without disconnecting the normal charge port.
- The rubber cap hole is located on the lower part of the cap.



Handling of charge port

Cleaning of charge port

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

Handling of damaged cap

Perform the following procedure if the cap becomes damaged:

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

Cleaning of the inside of rubber cap

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

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

DTC/CIRCUIT DIAGNOSIS

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

INFOID:000000007634010

1. CHECK FUSE

Check that the following fuse is not fusing.

Power supply	Fuse No.
Battery	33
	74
POWER switch ON	3

Is the fuse fusing?

- YES >> Replace the fuse after repairing the applicable circuit.
NO >> GO TO 2.

2. CHECK ON-BOARD CHARGER GROUND

1. Turn power switch OFF.
2. Disconnect on-board charger harness connector.
3. Check the continuity between on-board charger harness connector and ground.

+		-	Continuity
On-board charger			
Connector	terminal		
B26	22	Ground	Existed

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Repair or replace error-detected parts.

3. CHECK 12V BATTERY POWER SUPPLY-I

1. Check the voltage between on-board charger harness connector and ground.

+		-	Voltage
On-board charger			
Connector	terminal		
B26	11	Ground	12V battery voltage

Is the inspection result normal?

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

4. CHECK 12V BATTERY POWER SUPPLY CIRCUIT-I

1. Pull out #33 fuse.
2. Check the continuity between on-board charger harness connector and fuse terminal.

+		-	Continuity
On-board charger			
Connector	terminal		
B26	11	#33 fuse terminal	Existed

3. Also check harness for short to ground.

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

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

NO >> Repair or replace error-detected parts.

5.CHECK 12V BATTERY POWER SUPPLY-II (M/C RELAY)

1. Turn power switch ON.
2. Check the voltage between on-board charger harness connector and ground.

+		-	Voltage
On-board charger			
Connector	terminal		
B26	12	Ground	12V battery voltage

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6.

6.CHECK 12V BATTERY POWER SUPPLY CIRCUIT-II

1. Pull out #74 fuse.
2. Check the continuity between on-board charger harness connector and fuse terminal.

+		-	Continuity
On-board charger			
Connector	terminal		
B26	12	#74 fuse terminal	Existed

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

Is the inspection result normal?

YES >> Check M/C relay routing circuit. Refer to [EVC-327. "Diagnosis Procedure"](#).

NO >> Repair or replace error-detected parts.

7.CHECK POWER ON POWER SUPPLY

1. Turn power switch ON.
2. Check the voltage between on-board charger harness connector and ground.

+		-	Voltage (Approx.)
On-board charger			
Connector	terminal		
B26	13	Ground	11 – 14 V

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 8.

8.CHECK POWER ON POWER SUPPLY CIRCUIT

1. Pull out #3 fuse.
2. Turn power switch OFF.
3. Check the continuity between on-board charger harness connector and fuse terminal.

+		-	Continuity
On-board charger			
Connector	terminal		
B26	13	#3 fuse terminal	Existed

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

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

Is the inspection result normal?

- YES >> Check power supply circuit for POWER ON power supply.
- NO >> Repair or replace error-detected parts.

U1000 CAN COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

U1000 CAN COMMUNICATION

Description

INFOID:000000007634011

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

DTC Logic

INFOID:000000007634012

DTC DETECTION LOGIC

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
U1000	CAN COMM CIRCUIT (Missing message)	When on-board charger is not transmitting or receiving EV system CAN communication signal for 2 seconds or more.	• Harness or connectors (EV system CAN communication line is open or shorted)
	CAN COMM CIRCUIT (Erratic)		

DTC CONFIRMATION PROCEDURE

1. PERFORM CONFIRMATION PROCEDURE

With CONSULT

1. Turn power switch ON and wait at least 5 seconds.
2. Check "SELF-DIAG RESULTS" of "CHARGER".

Is DTC detected?

- YES >> Proceed to [VC-41, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007634013

Perform the trouble diagnosis for CAN communication system. Refer to [LAN-15, "Trouble Diagnosis Flow Chart"](#).

U1008, U100B QUICK CHARGER COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

U1008, U100B QUICK CHARGER COMMUNICATION

Description

INFOID:000000007634014

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

DTC Logic

INFOID:000000007634015

DTC DETECTION LOGIC

CAUTION:

This DTC may be detected if there is a malfunction in the quick charger. Check that the quick charger is normal when this DTC is detected.

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
U1008	QUICK CHARGER COMM (Missing message)	When on-board charger is not transmitting or receiving a quick charger communication signal for 2 seconds or more.	<ul style="list-style-type: none">• Harness or connectors (Quick charger communication line is open or shorted)• Quick charger• Quick charge port• On-board charger
	QUICK CHARGER COMM (Erratic)		
U100B	QUICK CHARGER COMM (Missing message)		

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

④ With CONSULT

1. Perform quick charging at least 5 seconds.
2. Turn power switch ON.
3. Check "SELF-DIAG RESULTS" of "CHARGER".

Is DTC detected?

- YES >> Proceed to [VC-42, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007634016

1. PERFORM DTC CONFIRMATION PROCEDURE AGAIN

④ With CONSULT

1. Turn power switch ON.
2. Erase DTC.
3. Turn power switch OFF.
4. Use an on-board charger which is different from the on-board charger used for the first DTC confirmation procedure, and perform the DTC confirmation procedure again. Refer to [VC-42, "DTC Logic"](#).

Is the DTC detected again?

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

2. CHECK QUICK CHARGE PORT CONDITION

Check for any adhering foreign substances, cracking, or damage on the quick charge port. Refer to [VC-37, "Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Clean or replace the quick charge port. Refer to [VC-110, "Removal and Installation"](#).

3. PERFORM COMPONENT INSPECTION

Perform component inspection. Refer to [VC-43, "Component Inspection \(Quick Charge Port\)"](#).

U1008, U100B QUICK CHARGER COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace quick charge port. Refer to [VC-110, "Removal and Installation"](#).

4. CHECK QUICK CHARGER COMMUNICATION CIRCUIT

1. Disconnect quick charge port harness connector and on-board charger harness connector.
2. Check the continuity between quick charge port harness connector and on-board charger harness connector.

+		-		Continuity
Quick charge port		On-board charger		
Connector	Terminal	Connector	Terminal	
E70	6	B25	6	Existed
	7		7	

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

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5. CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace on-board charger. Refer to [VC-105, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

Component Inspection (Quick Charge Port)

INFOID:000000007634017

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 disconnect the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- To prevent the removed service plug from being connected by mistake during the procedure, always carry it in your pocket or put it in the tool box.
- Be sure to wear insulating protective equipment consisting of glove, shoes, face shield and glasses 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 [VC-6, "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.
- Erase DTC after the work is completed.

1. PRECONDITIONING

WARNING:

Disconnect high voltage. Refer to [GI-31, "How to Disconnect High Voltage"](#).

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

1. Lift up the vehicle and remove the Li-ion battery under covers. Refer to [EVB-161, "Exploded View"](#) (TYPE 1), [EVB-377, "Exploded View"](#) (TYPE 2), [EVB-597, "Exploded View"](#) (TYPE 3) or [EVB-829, "Exploded View"](#) (TYPE 4).

NOTE:

Check the vehicle type to confirm the service information. Refer to [EVB-14, "How to Check Vehicle Type"](#).

U1008, U100B QUICK CHARGER COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

- Disconnect high voltage harness connector from front side of Li-ion battery. Refer to [EVB-161, "Removal and Installation"](#) (TYPE 1), [EVB-377, "Removal and Installation"](#) (TYPE 2), [EVB-597, "Removal and Installation"](#) (TYPE 3) or [EVB-829, "Removal and Installation"](#) (TYPE 4).
- Measure voltage between high voltage harness connector terminals.

DANGER:

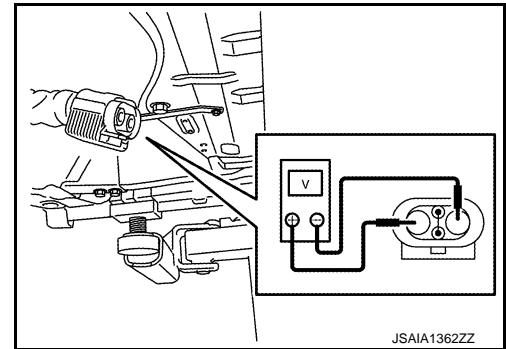
 Touching high voltage components without using the appropriate protective equipment will cause electrocution.



Standard : 5 V or less

CAUTION:

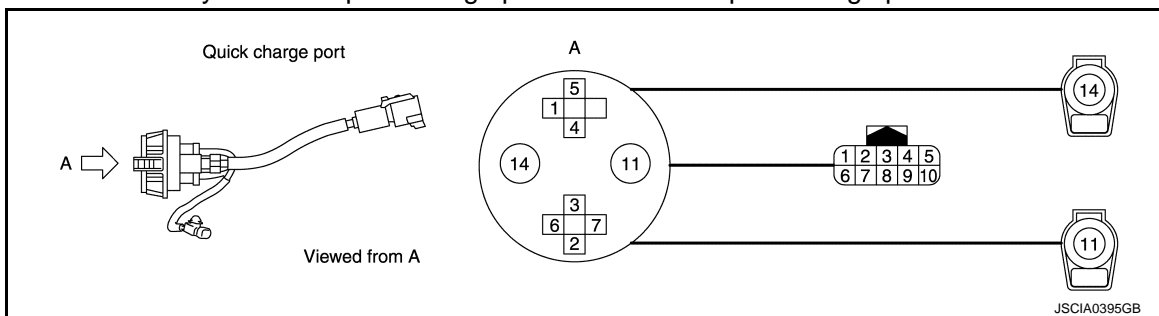
For voltage measurements, use a tester which can measure to 500 V or higher.



>> GO TO 2.

2. CHECK QUICK CHARGE PORT

- Turn power switch OFF.
- Remove quick charge port. Refer to [VC-110, "Removal and Installation"](#).
- Check the continuity between quick charge port terminal and quick charge port harness connector.



- Also check for short circuit between wires.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace quick charge port. Refer to [VC-110, "Removal and Installation"](#).

U100A CAN COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

U100A CAN COMMUNICATION

Description

INFOID:000000007634018

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

DTC Logic

INFOID:000000007634019

DTC DETECTION LOGIC

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
U100A	CAN COMM ERROR (Missing message)	When on-board charger is not transmitting or receiving EV system CAN communication signal for 2 seconds or more.	<ul style="list-style-type: none">Harness or connectors (EV system CAN communication line is open or shorted)

DTC CONFIRMATION PROCEDURE

1. PERFORM CONFIRMATION PROCEDURE

With CONSULT

- Turn power switch ON and wait at least 5 seconds.
- Check "SELF-DIAG RESULTS" of "CHARGER".

Is DTC detected?

- YES >> Proceed to [VC-45, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007634020

Perform the trouble diagnosis for CAN communication system. Refer to [LAN-15, "Trouble Diagnosis Flow Chart"](#).

U1010 CONTROL UNIT (CAN)

< DTC/CIRCUIT DIAGNOSIS >

U1010 CONTROL UNIT (CAN)

DTC Logic

INFOID:000000007634021

DTC DETECTION LOGIC

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
U1010	CONTROL UNIT (CAN) (Internal Electronic malfunction)	When on-board charger is not transmitting or receiving EV system CAN communication signal for 2 seconds or more.	<ul style="list-style-type: none">Harness or connectors (EV system CAN communication line is open or shorted)

DTC CONFIRMATION PROCEDURE

1. PERFORM CONFIRMATION PROCEDURE

With CONSULT

- Turn power switch ON and wait at least 5 seconds.
- Check "SELF-DIAG RESULTS" of "CHARGER".

Is DTC detected?

- YES >> Proceed to [VC-46, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007634022

1. PERFORM CONFIRMATION PROCEDURE AGAIN

With CONSULT

- Turn power switch ON.
- Erase self-diagnostic result.
- Perform DTC confirmation procedure. Refer to [VC-46, "DTC Logic"](#).
- Check self-diagnostic result.

Is the DTC detected again?

- YES >> Replace on-board charger. Refer to [VC-105, "Removal and Installation"](#).
NO >> INSPECTION END

B2801 QUICK CHARGE CONNECTOR

< DTC/CIRCUIT DIAGNOSIS >

B2801 QUICK CHARGE CONNECTOR

DTC Logic

INFOID:000000007634023

DTC DETECTION LOGIC

CAUTION:

This DTC may be detected if there is a malfunction in the quick charger. Check that the quick charger is normal when this DTC is detected.

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
B2801	Q/CHG ACTIVATION SIG ERROR (Signal invalid)	Disconnection of the charging connector is detected while the quick charge start/stop 1 signal is being received from the quick charger.	<ul style="list-style-type: none">• Harness or connectors (Quick charge port circuit is open or shorted)• Quick charger• Quick charge port• On-board charger

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

1. Turn power switch OFF.
2. Connect the quick charge connector to quick charge port.
3. Push the start button of quick charger and wait at least 1 minute.
4. Turn power switch ON.
5. Check "SELF-DIAG RESULTS" of "CHARGER".

Is DTC detected?

- YES >> Proceed to [VC-47, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007634024

1. PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT

1. Turn power switch ON.
2. Erase DTC.
3. Turn power switch OFF.
4. Perform DTC confirmation procedure again by using a quick charger other than the one is used for the previous DTC confirmation procedure. Refer to [VC-47, "DTC Logic"](#).

Is the DTC detected again?

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

2. CHECK QUICK CHARGE PORT CONDITION

Check for any adhering foreign substances, cracking, or damage on the quick charge port. Refer to [VC-37, "Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Clean or replace the quick charge port. Refer to [VC-110, "Removal and Installation"](#).

3. CHECK QUICK CHARGER CONNECTION SIGNAL POWER SUPPLY-I

1. Disconnect quick charge port harness connector.
2. Check the continuity between quick charge port harness connector terminals.

B2801 QUICK CHARGE CONNECTOR

< DTC/CIRCUIT DIAGNOSIS >

Quick charge port			Voltage
Connector	+	-	
	Terminals		
E70	3	5	12V battery voltage

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 4.

4.CHECK QUICK CHARGER CONNECTION SIGNAL POWER SUPPLY-II

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

+		-	Voltage
Quick charge port			
Connector	Terminal		
E70	3	Ground	12V battery voltage

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 5.

5.CHECK QUICK CHARGER CONNECTION SIGNAL POWER SUPPLY CIRCUIT

1. Disconnect on-board charger harness connector.
2. Check the continuity between quick charge port harness connector and on-board charger harness connector.

+		-		Continuity
Quick charge port		On-board charger		
Connector	Terminal	Connector	Terminal	
E70	3	B25	3	Existed

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

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair or replace error-detected parts.

6.CHECK QUICK CHARGER CONNECTION SIGNAL GROUND CIRCUIT

1. Disconnect on-board charger harness connector.
2. Check the continuity between quick charge port harness connector and on-board charger harness connector.

+		-		Continuity
Quick charge port		On-board charger		
Connector	Terminal	Connector	Terminal	
E70	5	B25	5	Existed

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

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair or replace error-detected parts.

7.PERFORM COMPONENT INSPECTION

Perform component inspection. Refer to [VC-49, "Component Inspection \(Quick Charge Port\)"](#).

B2801 QUICK CHARGE CONNECTOR

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 8.

NO >> Replace quick charge port. Refer to [VC-110, "Removal and Installation"](#).

8. CHECK QUICK CHARGE START/STOP 1 SIGNAL CIRCUIT

1. Disconnect on-board charger harness connector.
2. Check the continuity between quick charge port harness connector and on-board charger harness connector.

+		-		Continuity
Quick charge port		On-board charger		
Connector	Terminal	Connector	Terminal	
E70	1	B25	1	Existed

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

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair or replace error-detected parts.

9. CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace on-board charger. Refer to [VC-105, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

Component Inspection (Quick Charge Port)

INFOID:000000007634025

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 disconnect the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- To prevent the removed service plug from being connected by mistake during the procedure, always carry it in your pocket or put it in the tool box.
- Be sure to wear insulating protective equipment consisting of glove, shoes, face shield and glasses 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 [VC-6, "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.
- Erase DTC after the work is completed.

1. PRECONDITIONING

WARNING:

Disconnect high voltage. Refer to [GI-31, "How to Disconnect High Voltage"](#).

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

1. Lift up the vehicle and remove the Li-ion battery under covers. Refer to [EVB-161, "Exploded View"](#) (TYPE 1), [EVB-377, "Exploded View"](#) (TYPE 2), [EVB-597, "Exploded View"](#) (TYPE 3) or [EVB-829, "Exploded View"](#) (TYPE 4).

NOTE:

Check the vehicle type to confirm the service information. Refer to [EVB-14, "How to Check Vehicle Type"](#).

B2801 QUICK CHARGE CONNECTOR

< DTC/CIRCUIT DIAGNOSIS >

- Disconnect high voltage harness connector from front side of Li-ion battery. Refer to [EVB-161, "Removal and Installation"](#) (TYPE 1), [EVB-377, "Removal and Installation"](#) (TYPE 2), [EVB-597, "Removal and Installation"](#) (TYPE 3) or [EVB-829, "Removal and Installation"](#) (TYPE 4).
- Measure voltage between high voltage harness connector terminals.

DANGER:

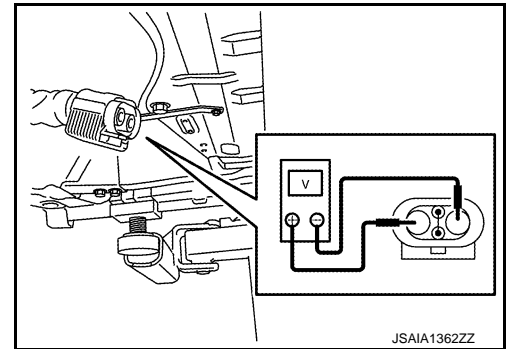


Touching high voltage components without using the appropriate protective equipment will cause electrocution.



Standard

: 5 V or less



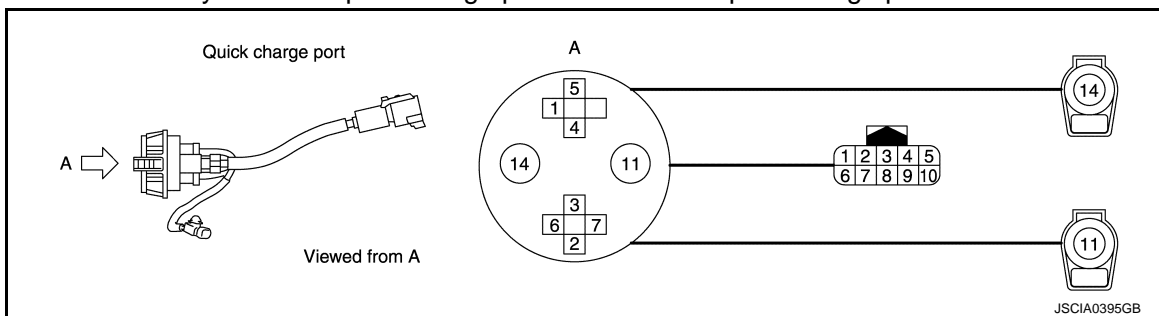
CAUTION:

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

>> GO TO 2.

2.CHECK QUICK CHARGE PORT

- Turn power switch OFF.
- Remove quick charge port. Refer to [VC-110, "Removal and Installation"](#).
- Check the continuity between quick charge port terminal and quick charge port harness connector.



- Also check for short circuit between wires.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace quick charge port. Refer to [VC-110, "Removal and Installation"](#).

B2802 QUICK CHARGER

< DTC/CIRCUIT DIAGNOSIS >

B2802 QUICK CHARGER

DTC Logic

INFOID:000000007634026

DTC DETECTION LOGIC

CAUTION:

This DTC may be detected if there is a malfunction in the quick charger. Check that the quick charger is normal when this DTC is detected.

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
B2802	Q/CHG ISOLATION SIGNAL ERROR (Signal stuck high)	When quick charge is started, the isolation check completion signal that is sent from the quick charger could not be received.	<ul style="list-style-type: none">• Harness or connectors (Quick charge port circuit is open or shorted)
	Q/CHG ISOLATION SIGNAL ERROR (Signal stuck low)	When quick charge is started, the isolation check completion signal that is sent from the quick charger by an abnormal timing.	<ul style="list-style-type: none">• Quick charger• Quick charge port• On-board charger

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

1. Turn power switch OFF.
2. Connect the quick charge connector to quick charge port.
3. Push the start button of quick charger and wait at least 1 minute.
4. Turn power switch ON.
5. Check "SELF-DIAG RESULTS" of "CHARGER".

Is DTC detected?

- YES >> Proceed to [VC-51, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007634027

1. PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT

1. Turn power switch ON.
2. Erase DTC.
3. Turn power switch OFF.
4. Perform DTC confirmation procedure again by using a quick charger other than the one is used for the previous DTC confirmation procedure. Refer to [VC-51, "DTC Logic"](#).

Is the DTC detected again?

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

2. CHECK QUICK CHARGE PORT CONDITION

Check for any adhering foreign substances, cracking, or damage on the quick charge port. Refer to [VC-37, "Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Clean or replace the quick charge port. Refer to [VC-110, "Removal and Installation"](#).

3. PERFORM COMPONENT INSPECTION

Perform component inspection. Refer to [VC-52, "Component Inspection \(Quick Charge Port\)"](#).

Is the inspection result normal?

- YES >> GO TO 4.
NO >> Replace quick charge port. Refer to [VC-110, "Removal and Installation"](#).

4. CHECK QUICK CHARGER COMMUNICATION CIRCUIT

B2802 QUICK CHARGER

< DTC/CIRCUIT DIAGNOSIS >

1. Turn power switch OFF.
2. Disconnect quick charge port harness connector and on-board charger harness connector.
3. Check the continuity between quick charge port harness connector and on-board charger harness connector.

+		-		Continuity
Quick charge port		On-board charger		
Connector	Terminal	Connector	Terminal	
E70	2	B25	2	Existed
	4		4	

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

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5. CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace on-board charger. Refer to [VC-105, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

Component Inspection (Quick Charge Port)

INFOID:000000007634028

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 disconnect the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- To prevent the removed service plug from being connected by mistake during the procedure, always carry it in your pocket or put it in the tool box.
- Be sure to wear insulating protective equipment consisting of glove, shoes, face shield and glasses 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 [VC-6, "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.
- Erase DTC after the work is completed.

1. PRECONDITIONING

WARNING:

Disconnect high voltage. Refer to [GI-31, "How to Disconnect High Voltage"](#).

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

1. Lift up the vehicle and remove the Li-ion battery under covers. Refer to [EVB-161, "Exploded View"](#) (TYPE 1), [EVB-377, "Exploded View"](#) (TYPE 2), [EVB-597, "Exploded View"](#) (TYPE 3) or [EVB-829, "Exploded View"](#) (TYPE 4).

NOTE:

- Check the vehicle type to confirm the service information. Refer to [EVB-14, "How to Check Vehicle Type"](#).
2. Disconnect high voltage harness connector from front side of Li-ion battery. Refer to [EVB-161, "Removal and Installation"](#) (TYPE 1), [EVB-377, "Removal and Installation"](#) (TYPE 2), [EVB-597, "Removal and Installation"](#) (TYPE 3) or [EVB-829, "Removal and Installation"](#) (TYPE 4).

B2802 QUICK CHARGER

< DTC/CIRCUIT DIAGNOSIS >

3. Measure voltage between high voltage harness connector terminals.

DANGER:



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

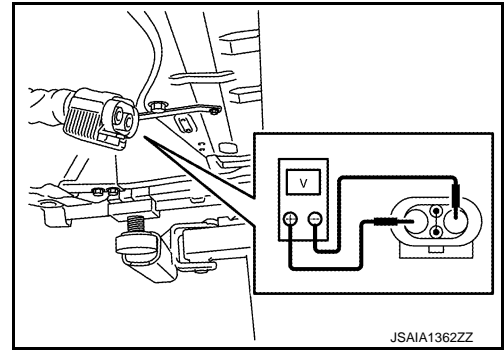


Standard

: 5 V or less

CAUTION:

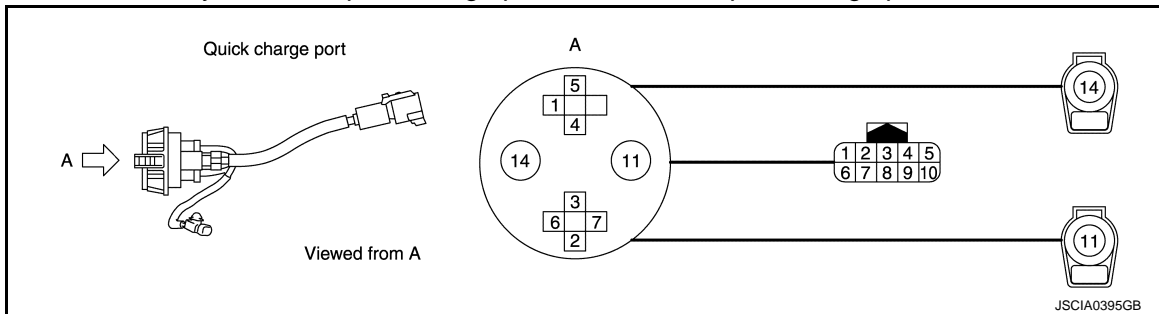
For voltage measurements, use a tester which can measure to 500 V or higher.



>> GO TO 2.

2. CHECK QUICK CHARGE PORT

1. Turn power switch OFF.
2. Remove quick charge port. Refer to [VC-110, "Removal and Installation"](#).
3. Check the continuity between quick charge port terminal and quick charge port harness connector.



4. Also check for short circuit between wires.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace quick charge port. Refer to [VC-110, "Removal and Installation"](#).

B2803 QUICK CHARGER

< DTC/CIRCUIT DIAGNOSIS >

B2803 QUICK CHARGER

DTC Logic

INFOID:000000007634029

DTC DETECTION LOGIC

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
B2803	Q/CHG PERMIT SIGNAL ERROR (Signal stuck low)	After receiving a quick charge start/stop 1 signal from the quick charger, a quick charge connector lock signal is received from the quick charger via the quick charger communication even when a charge permit signal is not transmitted from the on-board charger.	<ul style="list-style-type: none">• Harness or connectors (Quick charge permit signal circuit is shorted)• On-board charger

DTC CONFIRMATION PROCEDURE

1. PERFORM CONFIRMATION PROCEDURE

With CONSULT

1. Perform quick charging at least 5 seconds.
2. Check "SELF-DIAG RESULTS" of "CHARGER".

Is DTC detected?

- YES >> Proceed to [VC-54, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007634030

1. PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT

1. Turn power switch ON.
2. Erase DTC.
3. Turn power switch OFF.
4. Perform DTC confirmation procedure again by using a quick charger other than the one is used for the previous DTC confirmation procedure. Refer to [VC-54, "DTC Logic"](#).

Is the DTC detected again?

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

2. CHECK QUICK CHARGE PERMIT SIGNAL CIRCUIT-I

With CONSULT

1. Turn power switch ON.
2. On the CONSULT screen, select "CHARGER" >> "ACTIVE TEST" >> "QUICK CHARGE PERMIT".
3. Select "QUICK CHARGE PERMIT" of the monitor item.
4. Switch the quick charge permit signal circuit between ON and OFF to check that the "QUICK CHARGE PERMIT" indication changes.

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).
NO >> GO TO 3.

3. CHECK QUICK CHARGE PERMIT SIGNAL CIRCUIT-II

With CONSULT

1. Turn power switch OFF.
2. Disconnect quick charge port harness connector.
3. Turn power switch ON.
4. On the CONSULT screen, select "CHARGER" >> "ACTIVE TEST" >> "QUICK CHARGE PERMIT".
5. Turn ON the quick charge permit signal circuit first. After this, turn OFF the circuit.
6. Check the continuity between quick charge port harness connector and ground.

CAUTION:

B2803 QUICK CHARGER

< DTC/CIRCUIT DIAGNOSIS >

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

+		-	Continuity
Quick charge port			
Connector	Terminal	Ground	Not existed
E70	4		

Is the inspection result normal?

YES >> Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).

NO >> GO TO 4.

4. CHECK QUICK CHARGE PERMIT SIGNAL CIRCUIT-III

1. Turn power switch OFF.
2. Disconnect on-board charger harness connector.
3. Check the continuity between quick charge port harness connector and on-board charger harness connector.

+		-		Continuity
Quick charge port		On-board charger		
Connector	Terminal	Connector	Terminal	Existed
E70	4	B25	4	

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5. CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace on-board charger. Refer to [VC-105, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

B2813 NORMAL CHARGE RELAY

< DTC/CIRCUIT DIAGNOSIS >

B2813 NORMAL CHARGE RELAY

DTC Logic

INFOID:000000007634031

DTC DETECTION LOGIC

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
B2813	ON BOARD CHARGER (Signal stuck low)	A normal charge relay control circuit voltage remains 9 V or more for 3 seconds or more when the normal charge relay is operating.	<ul style="list-style-type: none"> Harness or connectors (On-board charger ground circuit is open) On-board charger

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

- Perform normal charging at least 10 seconds.
- Turn power switch ON.
- Check "SELF-DIAG RESULTS" of "CHARGER".

Is DTC detected?

YES >> Proceed to [VC-56, "Diagnosis Procedure"](#).

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007634032

1. CHECK ON-BOARD CHARGER GROUND CIRCUIT

- Turn power switch OFF.
- Disconnect on-board charger harness connector.
- Check the continuity between on-board charger harness connector and ground.

+		-	Continuity
On-board charger			
Connector	Terminal		
B26	22	Ground	Existed

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2. CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace on-board charger. Refer to [VC-105, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

B2814 QUICK CHARGE RELAY

< DTC/CIRCUIT DIAGNOSIS >

B2814 QUICK CHARGE RELAY

DTC Logic

INFOID:000000007634033

DTC DETECTION LOGIC

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
B2814	ON BOARD CHARGER (Signal stuck high)	A quick charge relay control circuit voltage remains 9 V or more for 3 seconds or more when the quick charge relay is operating.	<ul style="list-style-type: none">• Harness or connectors• On-board charger ground circuit is open• On-board charger

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

1. Perform quick charging at least 10 seconds.
2. Turn power switch ON.
3. Check "SELF-DIAG RESULTS" of "CHARGER".

Is DTC detected?

YES >> Proceed to [VC-57, "Diagnosis Procedure"](#).

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007634034

1. CHECK ON-BOARD CHARGER GROUND CIRCUIT

1. Turn power switch OFF.
2. Disconnect on-board charger harness connector.
3. Check the continuity between on-board charger harness connector and ground.

+		-	Continuity
On-board charger			
Connector	Terminal		
B26	22	Ground	Existed

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2. CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace on-board charger. Refer to [VC-105, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

B2820 QUICK CHARGER

< DTC/CIRCUIT DIAGNOSIS >

B2820 QUICK CHARGER

DTC Logic

INFOID:000000007634035

DTC DETECTION LOGIC

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
B2820	QUICK CHARGER (No sub type)	<ul style="list-style-type: none">• A quick charger malfunction signal is received from the quick charger.• A voltage detected by the quick charger differs from the one detected by the Li-ion battery controller.• A current output from the quick charger differs from target current.	<ul style="list-style-type: none">• Quick charger• Li-ion battery controller (voltage sensor system)

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

1. Perform quick charging at least 10 seconds.
2. Turn power switch ON.
3. Check "SELF-DIAG RESULTS" of "CHARGER".

Is DTC detected?

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

Diagnosis Procedure

INFOID:000000007634036

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

With CONSULT

Perform self-diagnosis for "HV BAT". Refer to [EVB-38, "CONSULT Function"](#) (TYPE 1), [EVB-246, "CONSULT Function"](#) (TYPE 2), [EVB-469, "CONSULT Function"](#) (TYPE 3) or [EVB-693, "CONSULT Function"](#) (TYPE 4).

NOTE:

Check the vehicle type to confirm the service information. Refer to [EVB-14, "How to Check Vehicle Type"](#).

Is any DTC detected?

- YES >> Perform trouble diagnosis for the DTC. Refer to [EVB-50, "DTC Index"](#) (TYPE 1), [EVB-258, "DTC Index"](#) (TYPE 2), [EVB-481, "DTC Index"](#) (TYPE 3) or [EVB-705, "DTC Index"](#) (TYPE 4).
- NO >> When this DTC is detected, the cause may not be in the vehicle. Therefore after erasing the self-diagnosis result, charge using a different quick charger than the quick charger which is used when the malfunction is detected.

B2821 12V POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

B2821 12V POWER SUPPLY

DTC Logic

INFOID:000000007634037

DTC DETECTION LOGIC

DTC	Trouble diagnosis name (Malfunction type)		DTC detecting condition	Possible cause
B2821	A	12V POWER SUPPLY (Signal stuck high)	While the on-board charger is stopped (sleep state), the power circuit voltage that is supplied from the M/C relay is 9 V or more for 60 seconds or more.	<ul style="list-style-type: none">• Harness or connectors (M/C relay power supply circuit is open or shorted.)• M/C relay routing circuit
	B	12V POWER SUPPLY (Signal stuck low)	While the on-board charger is operating, the power circuit voltage that is supplied from the M/C relay is less than 1 V for 3 seconds or more.	

DTC CONFIRMATION PROCEDURE

TYPE A

1. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

1. Turn power switch ON and wait at least 10 seconds.
2. Turn power switch OFF and wait at least 90 seconds.
3. Turn power switch ON.
4. Check "SELF-DIAG RESULTS" of "CHARGER".

Is DTC detected?

- YES >> Proceed to [VC-59, "Diagnosis Procedure"](#).
NO >> INSPECTION END

TYPE B

1. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

1. Turn power switch ON and wait at least 10 seconds.
2. Check "SELF-DIAG RESULTS" of "CHARGER".

Is DTC detected?

- YES >> Proceed to [VC-59, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007634038

1. PERFORM TROUBLE DIAGNOSIS FOR POWER SUPPLY CIRCUIT

Perform trouble diagnosis for power supply circuit. Refer to [VC-38, "Diagnosis Procedure"](#).

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).
NO >> Repair or replace error-detected parts.

B2827 NORMAL CHARGE RELAY

< DTC/CIRCUIT DIAGNOSIS >

B2827 NORMAL CHARGE RELAY

DTC Logic

INFOID:000000007634039

DTC DETECTION LOGIC

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
B2827	NORMAL CHARGE RELAY (Signal stuck low)	The normal charge relay control circuit voltage is less than 1 V for 1 second or more while the normal charge relay is operated.	<ul style="list-style-type: none">• Harness or connectors• Normal charge relay• On-board charger

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

Ⓢ With CONSULT

1. Set the vehicle to READY and wait at least 10 seconds.
2. Check "SELF-DIAG RESULTS" of "CHARGER".

Is DTC detected?

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

Diagnosis Procedure

INFOID:000000007634040

1. CHECK FUSE

1. Turn power switch OFF.
2. Pull out #74 fuse and check that the fuse is not fusing.

Is the fuse fusing?

- YES >> Replace the fuse after repairing the applicable circuit.
NO >> GO TO 2.

2. CHECK NORMAL CHARGE RELAY DRIVE VOLTAGE-I

1. Insert the fuse which pulled out.
2. Turn power switch ON.
3. Check the voltage between on-board charger harness connector and ground.

+		-	Voltage (Approx.)
On-board charger			
Connector	terminal		
B26	14	Ground	11 – 14 V
	15		

Is the inspection result normal?

- YES >> GO TO 8.
NO >> GO TO 3.

3. CHECK NORMAL CHARGE RELAY DRIVE VOLTAGE-II

1. Turn power switch OFF.
2. Disconnect DC/DC junction box harness connector.
3. Turn power switch ON.
4. Check the voltage between DC/DC junction box harness connector and ground.

+		-	Voltage (Approx.)
DC/DC J/B			
Connector	terminal		
F11	3	Ground	11 – 14 V

B2827 NORMAL CHARGE RELAY

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

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

4. CHECK NORMAL CHARGE RELAY CIRCUIT

Check normal charge relay circuit. Refer to [EVC-327, "Diagnosis Procedure"](#).

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Repair or replace error-detected parts.

5. CHECK NORMAL CHARGE RELAY DRIVE CIRCUIT

1. Check the continuity between DC/DC junction box harness connector and M/C relay harness connector.

+		-		Continuity
DC/DC J/B		M/C relay		
Connector	terminal	Connector	terminal	
F11	3	E65	5	Existed

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

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).
NO >> Repair or replace error-detected parts.

6. CHECK NORMAL CHARGE RELAY DRIVE CIRCUIT

1. Check the continuity between DC/DC junction box harness connector and on-board charger harness connector.

+		-		Continuity
DC/DC J/B		On-board charger		
Connector	terminal	Connector	terminal	
F11	4	B26	14	Existed
	7		15	

2. 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 NORMAL CHARGE RELAY

Check the resistance between DC/DC junction box connector terminals.

Item	DC/DC J/B			Condition [°C (°F)]	Resistance (Approx.)
	Connector	+	-		
		Terminals			
Normal charge relay +	F11	3	4	DC/DC J/B temperature: -40 – 80 (-40 – 176)	10 – 70 Ω
Normal charge relay -			7		

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).
NO >> Replace DC/DC junction box. Refer to [EVC-361, "Exploded View"](#).

8. CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace on-board charger. Refer to [VC-105, "Removal and Installation"](#).

B2827 NORMAL CHARGE RELAY

< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair or replace error-detected parts.

B2830 QUICK CHARGE VOLTAGE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

B2830 QUICK CHARGE VOLTAGE SENSOR

Description

INFOID:000000007634041

The quick charge voltage sensor is installed in the DC/DC junction box. The sensor detects the voltage between the high voltage circuit (+) side and (-) side on the upstream side of the quick charge relay (side where the quick charge port is located). The on-board charger uses this signal to monitor the status of the quick charge relay.

DTC Logic

INFOID:000000007634042

DTC DETECTION LOGIC

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
B2830	QUICK CHARGE VOLTAGE SENSOR (Component internal malfunction)	Before quick charging is started, the high voltage system voltage sent from the quick charge voltage sensor is 200 V or more for 10 second or more.	<ul style="list-style-type: none">• Harness or connectors• Quick charge voltage sensor• DC/DC J/B• Quick charge relay• High voltage cable installation malfunction
		During quick charging, the high voltage system voltage sent from the quick charge voltage sensor is less than 200 V for 10 seconds or more.	

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

1. Perform quick charging at least 30 seconds.
2. Turn power switch ON.
3. Check "SELF-DIAG RESULTS" of "CHARGER".

Is DTC detected?

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

Diagnosis Procedure

INFOID:000000007634043

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 disconnect the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- To prevent the removed service plug from being connected by mistake during the procedure, always carry it in your pocket or put it in the tool box.
- Be sure to wear insulating protective equipment consisting of glove, shoes, face shield and glasses 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 [VC-6, "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.
- Erase DTC after the work is completed.

1. CHECK SELF-DIAGNOSTIC RESULT IN VCM

With CONSULT

1. Turn power switch ON.
2. Check "SELF-DIAG RESULTS" of "EV/HEV".

B2830 QUICK CHARGE VOLTAGE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

Is any DTC is detected?

YES >> Check the DTC. Refer to [EVC-84, "DTC Index"](#).

NO >> GO TO 2.

2.CHECK QUICK CHARGE PORT CONDITION

Check for any adhering foreign substances, cracking, or damage on the quick charge port. Refer to [VC-37, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Clean or replace the quick charge port. Refer to [VC-110, "Removal and Installation"](#).

3.CHECK QUICK CHARGE RELAY OPERATION

With CONSULT

1. Turn power switch ON.
2. On the CONSULT screen, select "CHARGER" >> "ACTIVE TEST" >> "Q/CHG RELAY +".
3. Switch the quick charge relay between ON and OFF to check operating noise.

NOTE:

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

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

Is operating sound heard?

YES >> GO TO 12.

NO >> GO TO 4.

4.CHECK F/S CHG RELAY OPERATION

With CONSULT

1. On the CONSULT screen, select "EV/HEV" >> "ACTIVE TEST" >> "F/S CHG RELAY".
2. Switch the F/S CHG relay between ON and OFF to check operating noise of the F/S CHG relay.

Is operating sound heard?

YES >> GO TO 5.

NO >> Check F/S CHG relay system. Refer to [EVC-329, "Diagnosis Procedure"](#).

5.CHECK QUICK CHARGE RELAY DRIVE CIRCUIT-I

With CONSULT

1. Turn power switch OFF.
2. Disconnect on-board charger harness connector.
3. Turn power switch ON.
4. On the CONSULT screen, select "EV/HEV" >> "ACTIVE TEST" >> "F/S CHG RELAY".
5. Turn ON the F/S CHG relay.
6. Check the voltage between on-board charger harness connector and ground.

+		-	Voltage
On-board charger			
Connector	Terminal		
B26	17	Ground	12V battery voltage
	16		

Is the inspection result normal?

YES >> GO TO 10.

NO >> GO TO 6.

6.CHECK QUICK CHARGE RELAY POWER SUPPLY

With CONSULT

1. Turn power switch OFF.
2. Disconnect DC/DC junction box harness connector.
3. Turn power switch ON.
4. On the CONSULT screen, select "EV/HEV" >> "ACTIVE TEST" >> "F/S CHG RELAY".
5. Turn ON the F/S CHG relay.

B2830 QUICK CHARGE VOLTAGE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

- Check the voltage between DC/DC junction box harness connector and ground.

+		-	Voltage
DC/DC J/B			
Connector	Terminal		
F12	12	Ground	12V battery voltage

Is the inspection result normal?

- YES >> GO TO 8.
NO >> GO TO 7.

7. CHECK QUICK CHARGE RELAY POWER SUPPLY CIRCUIT

- Turn power switch OFF.
- Remove F/S CHG relay.
- Check the continuity between F/S CHG relay harness connector and DC/DC junction box harness connector.

+		-		Continuity
F/S CHG relay		DC/DC J/B		
Connector	Terminal	Connector	Terminal	
E64	5	F12	12	Existed

- Also check harness for short to ground.

Is the inspection result normal?

- YES >> Check F/S CHG relay system. Refer to [EVC-329, "Diagnosis Procedure"](#).
NO >> Repair or replace error-detected parts.

8. CHECK QUICK CHARGE RELAY

- Turn power switch OFF.
- Check the resistance between DC/DC junction box harness connector terminals.

Relay	Connector	DC/DC J/B		Resistance (Reference value)
		+	-	
		Terminals		
Quick charge relay +	F11	12	2	10 – 70 Ω
Quick charge relay -			9	

Is the inspection result normal?

- YES >> GO TO 9.
NO >> Replace DC/DC junction box. Refer to [EVC-361, "Removal and Installation"](#).

9. CHECK QUICK CHARGE RELAY DRIVE CIRCUIT-II

Check the continuity between DC/DC junction box harness connector and on-board charger harness connector.

+		-		Continuity
DC/DC J/B		On-board charger		
Connector	Terminal	Connector	Terminal	
F11	2	B26	17	Existed
	9		16	

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).
NO >> Repair or replace error-detected parts.

B2830 QUICK CHARGE VOLTAGE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

10. CHECK ON-BOARD CHARGER GROUND CIRCUIT

Check the continuity between on-board charger harness connector and ground.

+		-	Continuity
On-board charger			
Connector	Terminal		
B26	22	Ground	Existed

Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair or replace error-detected parts.

11. CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace DC/DC junction box. Refer to [EVC-361, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

12. CHECK QUICK CHARGE VOLTAGE SENSOR SIGNAL CIRCUIT

1. Turn power switch OFF.
2. Disconnect DC/DC junction box harness connector and on-board charger connector.
3. Check the continuity between DC/DC junction box harness connector and on-board charger harness connector.

+		-		Continuity
DC/DC J/B		On-board charger		
Connector	Terminal	Connector	Terminal	
F12	13	B27	27	Existed
	14		28	
	15		29	
	16		30	

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

Is the inspection result normal?

YES >> GO TO 13.

NO >> Repair or replace error-detected parts.

13. CHECK QUICK CHARGE VOLTAGE SENSOR

Perform component inspection. Refer to [VC-67, "Component Inspection \(Quick Charge Voltage Sensor\)"](#).

Is the inspection result normal?

YES >> GO TO 14.

NO >> Replace DC/DC junction box. Refer to [EVC-361, "Removal and Installation"](#).

14. PRECONDITIONING

WARNING:

Disconnect high voltage. Refer to [GI-31, "How to Disconnect High Voltage"](#).

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

1. Lift up the vehicle and remove the Li-ion battery under covers. Refer to [EVB-161, "Exploded View"](#) (TYPE 1), [EVB-377, "Exploded View"](#) (TYPE 2), [EVB-597, "Exploded View"](#) (TYPE 3) or [EVB-829, "Exploded View"](#) (TYPE 4).

NOTE:

2. Check the vehicle type to confirm the service information. Refer to [EVB-14, "How to Check Vehicle Type"](#).
Disconnect high voltage harness connector from front side of Li-ion battery. Refer to [EVB-161, "Removal and Installation"](#) (TYPE 1), [EVB-377, "Removal and Installation"](#) (TYPE 2), [EVB-597, "Removal and Installation"](#) (TYPE 3) or [EVB-829, "Removal and Installation"](#) (TYPE 4).

B2830 QUICK CHARGE VOLTAGE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

- Measure voltage between high voltage harness connector terminals.

DANGER:



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

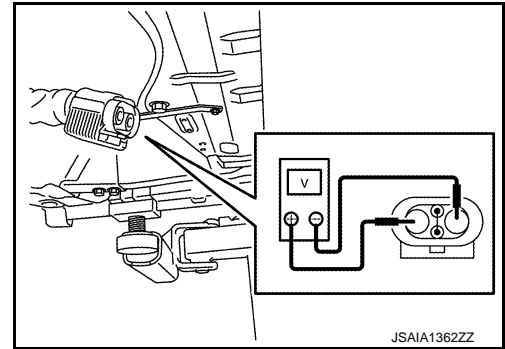


Standard

: 5 V or less

CAUTION:

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



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>> GO TO 15.

15. CHECK HIGH VOLTAGE HARNESS

- Disconnect the high voltage harness connector from the quick charge port and DC/DC junction box.
- Check the continuity between DC/DC junction box harness connector and quick charge port harness connector.

+		-		Continuity
DC/DC J/B		Quick charge port		
Connector	Terminal	Connector	Terminal	
H11	33	H14	14	Existed
	34	H13	11	

Is the inspection result normal?

YES >> GO TO 16.

NO >> Replace the high voltage harness.

16. CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace DC/DC junction box (high voltage circuit malfunction). Refer to [EVC-361, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

Component Inspection (Quick Charge Voltage Sensor)

INFOID:000000007634044

1. CHECK QUICK CHARGE VOLTAGE SENSOR

- Reconnect all harness connectors disconnected.
- Turn power switch ON.
- Check the voltage between on-board charger harness connector terminals.

Connector	On-board charger		Voltage
	+	-	
	Terminal		
B27	30	29	2.201 – 2.787 V
	27		
	30	27	-0.046 – 0.046 V

Is the inspection result normal?

YES >> INSPECTION END

B2830 QUICK CHARGE VOLTAGE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

NO >> Replace DC/DC junction box. Refer to [EVC-361, "Removal and Installation"](#).

B2840 ON-BOARD CHARGER

< DTC/CIRCUIT DIAGNOSIS >

B2840 ON-BOARD CHARGER

DTC Logic

INFOID:000000007634045

DTC DETECTION LOGIC

CAUTION:

Never use extension cables to charge the battery.

NOTE:

DTC "B2840" may be detected by the use of extension cables for normal charging of Li-ion battery.

DTC	Trouble diagnosis name (Malfunction type)		DTC detecting condition	Possible cause
B2840	A	ON BOARD CHARGER (General electrical malfunction)	<ul style="list-style-type: none"> • During normal charging, the PFC output voltage in the on-board charger is 412 V or more for 0.1 second or more, or 345 V or less, for 11 seconds or more.*1 • During normal charging, the PFC output voltage in the on-board charger is 450 V or more for 1 second or more, or 345 V or less, for 11 seconds or more.*2 • During normal charging (100 V), the on-board charger DC output current is 10A or more for 5 seconds or more. • During normal charging (200 V), the on-board charger DC output current is 18 A or more for 5 seconds or more. • During normal charging (100 V), the on-board charger DC output current is abnormally lower than the on-board charger command current value for 5 seconds or more. • During normal charging, the DC voltage output by the on-board charger is 440 V or more, or 240 V or less for 5 seconds or more. • During normal charging, the PFC circuit in the on-board charger operated however an abnormal status is continued for 1 second or more. 	On-board charger
	B	ON BOARD CHARGER (Component internal malfunction)	<ul style="list-style-type: none"> • When normal charging is started, a DC voltage output by the on-board charger of 460 V or more is detected. • During normal charging, the DC voltage output by the on-board charger is 200 V or less for 10 seconds or more. • During normal charging, the AC voltage input into the on-board charger is 293 V or more for 5 seconds or more. • During normal charging, a malfunction is detected in an on-board charger internal circuit. • During normal charging, the AC current input into the on-board charger is 22 A or more for 5 seconds or more. 	
	C	ON BOARD CHARGER (Component or system over temperature)	During normal charging, abnormal high temperature of an on-board charger internal circuit is continued for 100 seconds or more.	
	D	ON BOARD CHARGER (Parametric)	Ripple amplitude in output voltage of the on-board charger remains extremely large for 5 seconds or more during normal charge.	


*1: Applicable where the on-board charger number identified by "ECU identification" of CONSULT is "296A0 3NA0A".

*2: Applicable where the on-board charger number identified by "ECU identification" of CONSULT is not "296A0 3NA0A".

DTC CONFIRMATION PROCEDURE

TYPE A, B or D

1. PERFORM DTC CONFIRMATION PROCEDURE

 With CONSULT

B2840 ON-BOARD CHARGER

< DTC/CIRCUIT DIAGNOSIS >

1. Perform normal charging at least 15 seconds.
2. Turn power switch ON.
3. Check "SELF-DIAG RESULTS" of "CHARGER".

Is DTC detected?

- YES (TYPE A)>>Proceed to [VC-70, "TYPE A, B, AND C : Diagnosis Procedure"](#).
YES (TYPE B)>>Proceed to [VC-70, "TYPE A, B, AND C : Diagnosis Procedure"](#).
YES (TYPE D)>>Proceed to [VC-70, "TYPE D : Diagnosis Procedure"](#).
NO >> INSPECTION END

TYPE C

1.PERFORM DTC CONFIRMATION PROCEDURE

ⓅWith CONSULT

1. Perform normal charging at least 2 minutes.
2. Turn power switch ON.
3. Check "SELF-DIAG RESULTS" of "CHARGER".

Is DTC detected?

- YES >> Proceed to [VC-70, "TYPE A, B, AND C : Diagnosis Procedure"](#).
NO >> INSPECTION END

TYPE A, B, AND C

TYPE A, B, AND C : Diagnosis Procedure

INFOID:000000007634046

1.PERFORM CONFIRMATION PROCEDURE AGAIN

ⓅWith CONSULT

1. Turn power switch ON.
2. Erase self-diagnostic result.
3. Turn power switch OFF.
4. Perform DTC confirmation procedure. Refer to [VC-69, "DTC Logic"](#).

Is the DTC detected again?

- YES >> Replace on-board charger. Refer to [VC-105, "Removal and Installation"](#).
NO >> INSPECTION END

TYPE D

TYPE D : Diagnosis Procedure

INFOID:000000007634047

1.CHECK EVSE INDICATOR ON/OFF STATUS-I

ⓅWith CONSULT

1. Turn power switch ON.
2. Erase self-diagnostic result.
3. Turn power switch OFF.
4. Connect the EVSE to the vehicle and the AC power.
5. Check the EVSE indicator ON/OFF status.

EVSE indicator	Condition
Power	ON
Charge	OFF
Fault	OFF

Is the inspection result normal?

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

2.CHECK EVSE INDICATOR ON/OFF STATUS-II

Check the EVSE ON/OFF status, and verify that there are no abnormalities in the AC power. Refer to [VC-11, "EVSE"](#).

B2840 ON-BOARD CHARGER

< DTC/CIRCUIT DIAGNOSIS >

Were there no abnormalities in the AC power?

YES >> Replace EVSE.

NO >> Erase the DTC and explain to the customer that there is an abnormality in the AC power.

3. PERFORM CONFIRMATION PROCEDURE AGAIN

With CONSULT

1. Turn power switch ON.
2. Erase self-diagnostic result.
3. Turn power switch OFF.
4. Perform DTC confirmation procedure. Refer to [VC-69, "DTC Logic"](#).

Is the DTC detected again?

YES >> Replace on-board charger. Refer to [VC-105, "Removal and Installation"](#).

NO >> Check external input.

A

B

VC

D

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P

B2850 ON-BOARD CHARGER

< DTC/CIRCUIT DIAGNOSIS >

B2850 ON-BOARD CHARGER

Description

INFOID:000000007634048

The on-board charger contains 3 temperature sensors, and monitors the temperatures of the charging circuit and control circuit board.

The on-board charger also compares the signals from each sensor and detects malfunctions of sensor characteristic.

DTC Logic

INFOID:000000007634049

DTC DETECTION LOGIC

DTC	Trouble diagnosis name (Malfunction type)		DTC detecting condition	Possible cause
B2850	A	OBC TEMP SENSOR (Signal stuck high)	<ul style="list-style-type: none">During normal charging, the signal voltage of power device temperature sensor 1 in the on-board charger is 0.17 V or less, or 3.21 V or more, continuously for 3 seconds or more.During normal charging, the signal voltage of power device temperature sensor 2 in the on-board charger is 0.24 V or less, or 3.21 V or more, continuously for 3 seconds or more.	On-board charger
	B	OBC TEMP SENSOR (Signal invalid)	During normal charging, a deviation in the signals of the temperature sensors in the on-board charger is continued for 100 seconds or more.	

DTC CONFIRMATION PROCEDURE

TYPE A

1. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

1. Perform normal charging at least 10 seconds.
2. Turn power switch ON.
3. Check "SELF-DIAG RESULTS" of "CHARGER".

Is DTC detected?

- YES >> Proceed to [VC-72, "Diagnosis Procedure"](#).
NO >> INSPECTION END

TYPE B

1. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

1. Perform normal charging at least 2 minutes.
2. Turn power switch ON.
3. Check "SELF-DIAG RESULTS" of "CHARGER".

Is DTC detected?

- YES >> Proceed to [VC-72, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007634050

1. PERFORM CONFIRMATION PROCEDURE AGAIN

With CONSULT

1. Turn power switch ON.
2. Erase self-diagnostic result.
3. Turn power switch OFF.
4. Perform DTC confirmation procedure. Refer to [VC-72, "DTC Logic"](#).

Is the DTC detected again?

B2850 ON-BOARD CHARGER

< DTC/CIRCUIT DIAGNOSIS >

YES >> Replace on-board charger. Refer to [VC-105. "Removal and Installation"](#).
NO >> INSPECTION END

A

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B2880 F/S CHG RELAY

< DTC/CIRCUIT DIAGNOSIS >

B2880 F/S CHG RELAY

DTC Logic

INFOID:000000007634051

DTC DETECTION LOGIC

DTC	Trouble diagnosis name (Malfunction type)		DTC detecting condition	Possible cause
B2880	A	F/S CHG RELAY (Signal stuck low)	During quick charging, the voltage of a quick charge relay control circuit is less than 1 V for 3 seconds or more.	<ul style="list-style-type: none">• Harness or connectors• Quick charge relay• On-board charger• F/S CHG relay• F/S relay
	B	F/S CHG RELAY (Signal stuck high)	During quick charging, the voltage of a quick charge relay control circuit is 9 V or more for 3 seconds or more.	<ul style="list-style-type: none">• Harness or connectors• F/S CHG relay• F/S relay• On-board charger

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

1. Perform Quick charging at least 15 seconds.
2. Turn power switch ON.
3. Check "SELF-DIAG RESULTS" of "CHARGER".

Is DTC detected?

YES (TYPE A) >> Proceed to [VC-74, "TYPE A : Diagnosis Procedure"](#).

YES (TYPE B) >> Proceed to [VC-76, "TYPE B : Diagnosis Procedure"](#).

NO >> INSPECTION END

TYPE A

TYPE A : Diagnosis Procedure

INFOID:000000007634052

1. CHECK QUICK CHARGE RELAY OPERATION

With CONSULT

1. Turn power switch ON.
2. On the CONSULT screen, select "CHARGER" >> "ACTIVE TEST" >> "Q/CHG RELAY +".
3. Switch the quick charge relay between ON and OFF to check operating noise.

NOTE:

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

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

Can operating sound be heard?

YES >> Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).

NO >> GO TO 2.

2. CHECK F/S CHG RELAY OPERATION

With CONSULT

1. On the CONSULT screen, select "EV/HEV" >> "ACTIVE TEST" >> "F/S CHG RELAY".
2. Switch the F/S CHG relay between ON and OFF to check operating noise of the F/S CHG relay.

Can operating sound be heard?

YES >> GO TO 3.

NO >> Check F/S CHG relay system. Refer to [EVC-329, "Diagnosis Procedure"](#).

3. CHECK QUICK CHARGE RELAY DRIVE CIRCUIT-I

With CONSULT

1. Turn power switch OFF.
2. Disconnect on-board charger harness connector.
3. Turn power switch ON.

B2880 F/S CHG RELAY

< DTC/CIRCUIT DIAGNOSIS >

4. On the CONSULT screen, select "EV/HEV" >> "ACTIVE TEST" >> "F/S CHG RELAY".
5. Turn ON the F/S CHG relay.
6. Check the voltage between on-board charger harness connector and ground.

+		-	Voltage
On-board charger			
Connector	Terminal	Ground	12V battery voltage
B26	17		
	16		

Is the inspection result normal?

- YES >> GO TO 8.
 NO >> GO TO 4.

4.CHECK QUICK CHARGE RELAY POWER SUPPLY

With CONSULT

1. Turn power switch OFF.
2. Disconnect DC/DC junction box harness connector.
3. Turn power switch ON.
4. On the CONSULT screen, select "EV/HEV" >> "ACTIVE TEST" >> "F/S CHG RELAY".
5. Turn ON the F/S CHG relay.
6. Check the voltage between DC/DC junction box harness connector and ground.

+		-	Voltage
DC/DC J/B			
Connector	Terminal	Ground	12V battery voltage
F12	12		

Is the inspection result normal?

- YES >> GO TO 6.
 NO >> GO TO 5.

5.CHECK QUICK CHARGE RELAY POWER SUPPLY CIRCUIT

1. Turn power switch OFF.
2. Remove F/S CHG relay.
3. Check the continuity between F/S CHG relay harness connector and DC/DC junction box harness connector.

+	-		Continuity
F/S CHG relay	DC/DC J/B		
Terminal	Connector	Terminal	
5	F12	12	Existed

4. Also check harness for short to ground.

Is the inspection result normal?

- YES >> Check F/S CHG relay system. Refer to [EVC-329. "Diagnosis Procedure"](#).
 NO >> Repair or replace error-detected parts.

6.CHECK QUICK CHARGE RELAY

1. Turn power switch OFF.
2. Check the resistance between DC/DC junction box harness connector terminals.

B2880 F/S CHG RELAY

< DTC/CIRCUIT DIAGNOSIS >

Relay	DC/DC J/B			Resistance (Reference value)
	Connector	+	-	
		Terminals		
Quick charge relay +	F11	12	2	10 – 70 Ω
Quick charge relay –			9	

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace DC/DC junction box. Refer to [EVC-361, "Removal and Installation"](#).

7.CHECK QUICK CHARGE RELAY DRIVE CIRCUIT-II

Check the continuity between DC/DC junction box harness connector and on-board charger harness connector.

+		-		Continuity
DC/DC J/B		On-board charger		
Connector	Terminal	Connector	Terminal	
F11	2	B26	17	Existed
	9		16	

Is the inspection result normal?

YES >> Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).

NO >> Repair or replace error-detected parts.

8.CHECK ON-BOARD CHARGER GROUND CIRCUIT

Check the continuity between on-board charger harness connector and ground.

+		-	Continuity
On-board charger			
Connector	Terminal		
B26	22	Ground	Existed

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair or replace error-detected parts.

9.CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace DC/DC junction box. Refer to [EVC-361, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

TYPE B

TYPE B : Diagnosis Procedure

INFOID:000000007634053

1.CHECK QUICK CHARGE RELAY DRIVE VOLTAGE

1. Turn power switch OFF.
2. Disconnect on-board charger harness connector.
3. Turn power switch ON.
4. Check the voltage between on-board charger harness connector and ground.

B2880 F/S CHG RELAY

< DTC/CIRCUIT DIAGNOSIS >

+		-	Voltage (Approx.)
On-board charger			
Connector	Terminal	Ground	0 V
B26	16		
	17		

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to [GI-51. "Intermittent Incident"](#).
NO >> GO TO 2.

2.CHECK QUICK CHARGE RELAY DRIVE CIRCUIT-I

1. Turn power switch OFF.
2. Disconnect DC/DC junction box harness connector.
3. Turn power switch ON.
4. Check the voltage between DC/DC junction box harness connector and ground.

+		-	Voltage (Approx.)
DC/DC J/B			
Connector	Terminal	Ground	0 V
F11	12		

Is the inspection result normal?

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

3.CHECK QUICK CHARGE RELAY POWER SUPPLY

1. Turn power switch OFF.
2. Remove F/S CHG relay.
3. Turn power switch ON.
4. Check the voltage between DC/DC junction box harness connector and ground.

+		-	Voltage (Approx.)
DC/DC J/B			
Connector	Terminal	Ground	0 V
F11	12		

Is the inspection result normal?

- YES >> Check F/S CHG relay system. Refer to [EVC-329. "Diagnosis Procedure"](#).
NO >> There may be a short circuit in the location between power and an area between the F/S CHG relay harness connector and the DC/DC junction box harness connector. Check harness for short circuit.

4.CHECK QUICK CHARGE RELAY DRIVE CIRCUIT-II

Check the voltage between on-board charger harness connector and ground.

+		-	Voltage (Approx.)
On-board charger			
Connector	Terminal	Ground	0 V
B26	16		
	17		

Is the inspection result normal?

- YES >> GO TO 5.

B2880 F/S CHG RELAY

< DTC/CIRCUIT DIAGNOSIS >

NO >> There may be a short circuit in the location between power and an area between the DC/DC junction box harness connector and the on-board charger harness connector. Check harness for short circuit.

5.CHECK DC/DC JUNCTION BOX TERMINAL VOLTAGE

Check the voltage between DC/DC junction box connector and ground.

+		
DC/DC J/B Terminal	-	Voltage
2	Ground	0 V
9		

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace DC/DC junction box. Refer to [EVC-361, "Removal and Installation"](#).

6.CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace on-board charger. Refer to [VC-105, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

B28A0 NORMAL CHARGING CONNECTOR CONNECTION DETECTING CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

B28A0 NORMAL CHARGING CONNECTOR CONNECTION DETECTING CIRCUIT

Description

INFOID:000000007634054

The high voltage connector connection detecting circuit monitors the connection status of the high voltage connector.

The high voltage connector connection detecting circuit is composed of 2 circuits: the input side and output side. When the high voltage connector is connected, the input side and outputs side are connected via the contacts inside the high voltage connector, forming the circuit.

On-board charger outputs monitor signal to the output of the high voltage connector connection detecting circuit, and monitors the high voltage connector connection status from the input signal on the input side.

DTC Logic

INFOID:000000007634055

DTC DETECTION LOGIC

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
B28A0	NORMAL CHARGE INTER-LOCK (AC) (Signal stuck high)	During normal charging, the input voltage of the connection detecting circuit is 0.8 V or less for 3 seconds or more.	<ul style="list-style-type: none">On-board charger (Connection detecting circuit)High voltage harnessNormal charge port

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

- Perform normal charging at least 10 seconds.
- Turn power switch ON.
- Check "SELF-DIAG RESULTS" of "CHARGER".

Is DTC detected?

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

Diagnosis Procedure

INFOID:000000007634056

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 disconnect the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- To prevent the removed service plug from being connected by mistake during the procedure, always carry it in your pocket or put it in the tool box.
- Be sure to wear insulating protective equipment consisting of glove, shoes, face shield and glasses 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 [VC-6, "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.
- Erase DTC after the work is completed.

1. PRECONDITIONING

B28A0 NORMAL CHARGING CONNECTOR CONNECTION DETECTING CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

WARNING:

Disconnect high voltage. Refer to [GI-31, "How to Disconnect High Voltage"](#).

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

1. Lift up the vehicle and remove the Li-ion battery under covers. Refer to [EVB-161, "Exploded View"](#) (TYPE 1), [EVB-377, "Exploded View"](#) (TYPE 2), [EVB-597, "Exploded View"](#) (TYPE 3) or [EVB-829, "Exploded View"](#) (TYPE 4).

NOTE:

Check the vehicle type to confirm the service information. Refer to [EVB-14, "How to Check Vehicle Type"](#).

2. Disconnect high voltage harness connector from front side of Li-ion battery. Refer to [EVB-161, "Removal and Installation"](#) (TYPE 1), [EVB-377, "Removal and Installation"](#) (TYPE 2), [EVB-597, "Removal and Installation"](#) (TYPE 3) or [EVB-829, "Removal and Installation"](#) (TYPE 4).
3. Measure voltage between high voltage harness connector terminals.

DANGER:



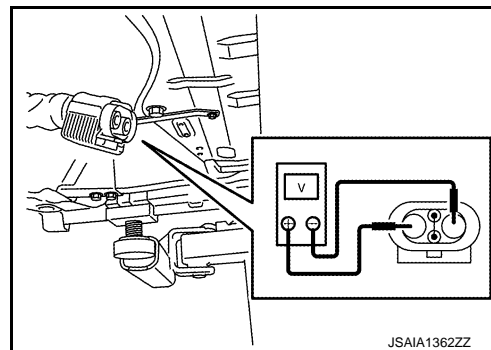
Touching high voltage components without using the appropriate protective equipment will cause electrocution.



Standard : 5 V or less

CAUTION:

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



>> GO TO 2.

2. CHECK CONNECTION DETECTING CIRCUIT POWER SUPPLY

1. Reconnect 12V battery negative terminal.
2. Disconnect normal charge port high voltage harness connector.
3. Turn power switch ON.
4. Check the voltage between normal charge port high voltage harness connector and ground.

+		-	Voltage (Approx.)
Normal charge port			
Connector	Terminal		
H8	10	Ground	2.5 V

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 3.

3. CHECK CONNECTION DETECTING CIRCUIT (OUTPUT SIDE)

1. Turn power switch OFF.
2. Disconnect on-board charger high voltage harness connector.
3. Check the continuity between on-board charger harness connector and normal charge port harness connector.

+		-		Continuity
On-board charger		Normal charge port		
Connector	Terminal	Connector	Terminal	
H6	40	H8	10	Existed

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

Is the inspection result normal?

YES >> GO TO 4.

B28A0 NORMAL CHARGING CONNECTOR CONNECTION DETECTING CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair or replace error-detected parts.

4.CHECK ON-BOARD CHARGER POWER SUPPLY AND GROUND CIRCUIT

Check on-board charger power supply and ground circuit. Refer to [VC-38, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> Replace on-board charger. Refer to [VC-105, "Exploded View"](#).

NO >> Repair or replace error-detected parts.

5.CHECK NORMAL CHARGE PORT

1. Turn power switch OFF.
2. Check the continuity between normal charge port connector terminals.

Normal charge port		Continuity
Terminal		
+	-	
10	11	Existed

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace normal charge port.

6.CHECK CONNECTION DETECTING CIRCUIT (INPUT SIDE)

1. Disconnect on-board charger high voltage harness connector.
2. Check the continuity between on-board charger harness connector and normal charge port harness connector.

+		-		Continuity
On-board charger		Normal charge port		
Connector	Terminal	Connector	Terminal	
H6	41	H8	11	Existed

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

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace error-detected parts.

7.CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).

Is inspection result normal?

YES >> Replace on-board charger. Refer to [VC-105, "Exploded View"](#).

NO >> Repair or replace the error-detected parts.

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B28B0 NORMAL CHARGE HIGH VOLTAGE CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

B28B0 NORMAL CHARGE HIGH VOLTAGE CIRCUIT

Description

INFOID:000000007634057

The high voltage connector interlock detecting circuit monitors the connection status of the high voltage connector.

The high voltage connector interlock detecting circuit is composed of 2 circuits: the input side and output side. When the high voltage connector is connected, the input side and outputs side are connected via the contacts inside the high voltage connector, forming the circuit.

The ECU outputs monitor signal to the output of the high voltage connector interlock detecting circuit, and monitors the high voltage connector connection status from the input signal on the input side.

DTC Logic

INFOID:000000007634058

DTC DETECTION LOGIC

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
B28B0	NORMAL CHARGE INTER-LOCK (DC) (Signal stuck high)	During normal charging, the input voltage of the connection detecting circuit is 0.8 V or less for 3 seconds or more.	<ul style="list-style-type: none">On-board charger (Connection detecting circuit)High voltage harness

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

1. Perform normal charging at least 10 seconds.
2. Turn power switch ON.
3. Check "SELF-DIAG RESULTS" of "CHARGER".

Is DTC detected?

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

Diagnosis Procedure

INFOID:000000007634059

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 disconnect the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- To prevent the removed service plug from being connected by mistake during the procedure, always carry it in your pocket or put it in the tool box.
- Be sure to wear insulating protective equipment consisting of glove, shoes, face shield and glasses 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 [VC-6, "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.
- Erase DTC after the work is completed.

1. PRECONDITIONING

WARNING:

Disconnect high voltage. Refer to [GI-31, "How to Disconnect High Voltage"](#).

B28B0 NORMAL CHARGE HIGH VOLTAGE CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

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

1. Lift up the vehicle and remove the Li-ion battery under covers. Refer to [EVB-161, "Exploded View"](#) (TYPE 1), [EVB-377, "Exploded View"](#) (TYPE 2), [EVB-597, "Exploded View"](#) (TYPE 3) or [EVB-829, "Exploded View"](#) (TYPE 4).

NOTE:

Check the vehicle type to confirm the service information. Refer to [EVB-14, "How to Check Vehicle Type"](#).

2. Disconnect high voltage harness connector from front side of Li-ion battery. Refer to [EVB-161, "Removal and Installation"](#) (TYPE 1), [EVB-377, "Removal and Installation"](#) (TYPE 2), [EVB-597, "Removal and Installation"](#) (TYPE 3) or [EVB-829, "Removal and Installation"](#) (TYPE 4).
3. Measure voltage between high voltage harness connector terminals.

DANGER:

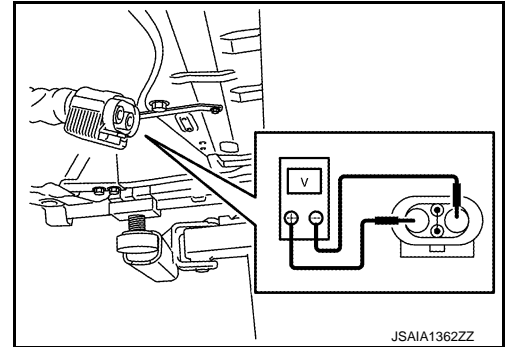


Touching high voltage components without using the appropriate protective equipment will cause electrocution.



Standard

: 5 V or less



JSAIA1362ZZ

CAUTION:

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

>> GO TO 2.

2. CHECK HIGH VOLTAGE HARNESS CONNECTOR

1. Turn power switch OFF.
2. Disconnect on-board charger high voltage harness connector.
3. Check the continuity between high voltage harness connector terminals.

Connector	On-board charger		Continuity
	Terminal		
	+	-	
H5	42	43	Existed

Is the inspection result normal?

- YES >> GO TO 3.
- NO >> Replace high voltage harness.

3. CHECK ON-BOARD CHARGER POWER SUPPLY AND GROUND CIRCUIT

Check on-board charger power supply and ground circuit. Refer to [VC-38, "Diagnosis Procedure"](#).

Is the inspection result normal?

- YES >> GO TO 4.
- NO >> Repair or replace error-detected parts.

4. CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace on-board charger. Refer to [VC-105, "Removal and Installation"](#).
- NO >> Repair or replace the error-detected parts.

B2900, B2902 ON-BOARD CHARGER

< DTC/CIRCUIT DIAGNOSIS >

B2900, B2902 ON-BOARD CHARGER

DTC Logic

INFOID:000000007634060

DTC DETECTION LOGIC

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
B2900	ON BOARD CHARGER (Program memory error)	On-board charger ROM is malfunctioning.	On-board charger
	ON BOARD CHARGER (Data memory error)	On-board charger RAM is malfunctioning.	
B2902	ON BOARD CHARGER (General memory error)	On-board charger EEPROM is malfunctioning.	

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

1. Turn power switch ON and wait at least 5 seconds.
2. Check "SELF-DIAG RESULTS" of "CHARGER".

Is DTC detected?

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

Diagnosis Procedure

INFOID:000000007634061

1. PERFORM CONFIRMATION PROCEDURE AGAIN

With CONSULT

1. Erase self-diagnostic result.
2. Turn power switch OFF.
3. Perform DTC confirmation procedure. Refer to [VC-84, "DTC Logic"](#).

Is the DTC detected again?

- YES >> Replace on-board charger. Refer to [VC-105, "Removal and Installation"](#).
NO >> INSPECTION END

B2980 QUICK CHARGE PORT

< DTC/CIRCUIT DIAGNOSIS >

B2980 QUICK CHARGE PORT

Description

INFOID:000000007634062

The quick charge port contains a temperature sensor, and the quick charge port temperature signal is sent as two lines of voltage signal to the on-board charger.

DTC Logic

INFOID:000000007634063

DTC DETECTION LOGIC

DTC	Trouble diagnosis name (Malfunction type)	DTC detecting condition	Possible cause
B2980	QUICK CHARGE PORT TEMP (Signal stuck high)	<ul style="list-style-type: none">During quick charging, the quick charge port temperature sensor signal voltage is 4.6V or more for 3 seconds or more.During quick charging, the quick charge port temperature sensor signal voltage is less than 0.15 V for 3 seconds or more.	<ul style="list-style-type: none">Harness or connectors (Quick charge port is open or shorted)Quick charge portQuick charger
	QUICK CHARGE PORT TEMP (component or system over temperature)	During quick charging, the quick charge port temperature sensor signal voltage is 4.4V or more and less than 4.6V for 3 seconds or more.	

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

- Perform quick charging at least 10 seconds.
- Turn power switch ON.
- Check "SELF-DIAG RESULTS" of "CHARGER".

Is DTC detected?

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

Diagnosis Procedure

INFOID:000000007634064

1. PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT

- Turn power switch ON.
- Erase self-diagnostic result.
- Turn power switch OFF.
- Perform DTC confirmation procedure again by using a quick charger other than the one is used for the previous DTC confirmation procedure. Refer to [VC-85, "DTC Logic"](#).

Is the DTC detected again?

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

2. CHECK QUICK CHARGE PORT CONDITION

Check for any adhering foreign substances, cracking, or damage on the quick charge port.

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Clean or replace the quick charge port.

3. CHECK QUICK CHARGE PORT HARNESS CONNECTOR

- Turn power switch OFF.
- Disconnect quick charge port harness connector.
- Check quick charge port harness connector (E70). Refer to [GI-48, "How to Check Terminal"](#).

B2980 QUICK CHARGE PORT

< DTC/CIRCUIT DIAGNOSIS >

4. Check contact pressure of quick charge port harness connector (E70). Refer to [GI-48, "How to Check Terminal"](#).
5. Check the waterproof condition of quick charge port harness connector (E70). Refer to [GI-48, "How to Check Terminal"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK QUICK CHARGE PORT TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

1. Disconnect on-board charger harness connector.
2. Check the continuity between quick charge port harness connector and on-board charger harness connector.

+		-		Continuity
Quick charge port		On-board charger		
Connector	Terminal	Connector	Terminal	
E70	9	B27	25	Existed
	10		26	

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

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.CHECK QUICK CHARGE PORT TEMPERATURE SENSOR GROUND CIRCUIT

1. Disconnect on-board charger harness connector.
2. Check the continuity between quick charge port harness connector and on-board charger harness connector.

+		-		Continuity
Quick charge port		On-board charger		
Connector	Terminal	Connector	Terminal	
E70	5	B25	5	Existed

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6.CHECK ON-BOARD CHARGER GROUND CIRCUIT

Check the continuity between on-board charger harness connector and ground.

+		-	Continuity
On-board charger			
Connector	Terminal		
B26	22	Ground	Existed

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace error-detected parts.

7.CHECK QUICK CHARGE PORT TEMPERATURE SENSOR

Perform component inspection. Refer to [VC-87, "Component Inspection \(Quick Charge Port\)"](#).

Is the inspection result normal?

YES >> GO TO 8.

NO >> Replace quick charge port. Refer to [VC-110, "Removal and Installation"](#).

B2980 QUICK CHARGE PORT

< DTC/CIRCUIT DIAGNOSIS >

8. CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace on-board charger. Refer to [VC-105, "Removal and Installation"](#).
NO >> Repair or replace error-detected parts.

Component Inspection (Quick Charge Port)

INFOID:000000007634065

VC

1. QUICK CHARGE PORT (TEMPERATURE SENSOR)

1. Turn power switch OFF.
2. Disconnect quick charge port harness connector.
3. Check the resistance between quick charge port terminals.

Terminals	Condition	Resistance (Ω)
5 - 9	Temperature [$^{\circ}\text{C}$ ($^{\circ}\text{F}$): -40 - 50 (-40 - 122)]	5 - 50
5 - 10		

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Replace quick charge port. Refer to [VC-110, "Removal and Installation"](#).

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B29A0 NORMAL CHARGE PORT

< DTC/CIRCUIT DIAGNOSIS >

B29A0 NORMAL CHARGE PORT

DTC Logic

INFOID:000000007634066

DTC DETECTION LOGIC

DTC	Trouble diagnosis name (Malfunction type)		DTC detecting condition	Possible cause
B29A0	A	N/CHG PORT ENGAGEMENT ERROR (Signal stuck high)	<ul style="list-style-type: none">When normal charging is started or during charging, the EVSE connection detecting circuit signal voltage is approximately 4.3 V or more, or approximately 0.8 V or lower for 3 seconds or more.During normal charging, the EVSE connection detecting circuit signal voltage is 3.3 V or more for 3 seconds or more.	<ul style="list-style-type: none">Harness or connectors (Normal charge port is open or shorted)Normal charge portEVSEOn-board charger
	B	N/CHG PORT ENGAGEMENT ERROR (Signal invalid)	During normal charging, the EVSE connection detecting circuit signal voltage is approximately 2 V or more and 3.3 V or less for 100 seconds or more.	<ul style="list-style-type: none">Harness or connectors (Normal charge port is open or shorted)Normal charge port

DTC CONFIRMATION PROCEDURE

TYPE A

1. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

- Perform normal charging at least 10 seconds.
- Turn power switch ON.
- Check "SELF-DIAG RESULTS" of "CHARGER".

Is DTC detected?

- YES >> Proceed to [VC-88, "TYPE A : Diagnosis Procedure"](#).
NO >> INSPECTION END

TYPE B

1. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

- Perform normal charging at least 2 minutes.
- Turn power switch ON.
- Check "SELF-DIAG RESULTS" of "CHARGER".

Is DTC detected?

- YES >> Proceed to [VC-90, "TYPE B : Diagnosis Procedure"](#).
NO >> INSPECTION END

TYPE A

TYPE A : Diagnosis Procedure

INFOID:000000007634067

1. PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT

- Turn power switch ON.
- Erase self-diagnostic result.
- Turn power switch OFF.
- Perform the confirmation procedure again using a EVSE other than the one that is used for the initial confirmation procedure. Refer to [VC-88, "DTC Logic"](#).

Is the DTC detected again?

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

B29A0 NORMAL CHARGE PORT

< DTC/CIRCUIT DIAGNOSIS >

2.CHECK EVSE CONNECTION DETECTING CIRCUIT POWER SUPPLY

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

+		-	Voltage (Approx.)
Normal charge port			
Connector	Terminal		
E71	3	Ground	5.0 V

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 3.

3.CHECK EVSE CONNECTION DETECTING CIRCUIT

1. Turn power switch OFF.
2. Disconnect on-board charger harness connector.
3. Check the continuity between normal charge port harness connector and on-board charger harness connector.

+		-		Continuity
Normal charge port		On-board charger		
Connector	Terminal	Connector	Terminal	
E71	3	B25	10	Existed

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

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK EVSE CONNECTION DETECTING CIRCUIT GROUND CIRCUIT

1. Turn power switch OFF.
2. Disconnect high voltage harness connector from on-board charger and normal charge port.
3. Check the continuity between normal charge port harness connector and on-board charger harness connector.

+		-		Continuity
Normal charge port		On-board charger		
Connector	Terminal	Connector	Terminal	
H8	5	H6	35	Existed

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.CHECK NORMAL CHARGE PORT

Perform component inspection. Refer to [VC-90, "Component Inspection \(Normal Charge Port\)"](#).

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace normal charge port. Refer to [VC-115, "Removal and Installation"](#).

6.CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).

Is the inspection result normal?

B29A0 NORMAL CHARGE PORT

< DTC/CIRCUIT DIAGNOSIS >

- YES >> Replace on-board charger. Refer to [VC-105, "Removal and Installation"](#).
NO >> Repair or replace error-detected parts.

TYPE B

TYPE B : Diagnosis Procedure

INFOID:000000007634068

1. CHECK EVSE RELEASE SWITCH STATUS

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

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair or clean.

2. PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT

1. Turn power switch ON.
2. Erase self-diagnostic result.
3. Turn power switch OFF.
4. Perform DTC confirmation procedure again by using a EVSE other than the one is used for the previous DTC confirmation procedure. Refer to [VC-88, "DTC Logic"](#).

Is the DTC detected again?

- YES >> Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).
NO >> Replace EVSE.

Component Inspection (Normal Charge Port)

INFOID:000000007634069

1. NORMAL CHARGE PORT

1. Turn power switch OFF.
2. Disconnect EVSE.
3. Disconnect normal charge port harness connector.
4. Check the resistance between normal charge port terminals.

Terminals	Resistance (kΩ)
3 and 5	2.43 – 2.97

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Replace normal charge port. Refer to [VC-115, "Removal and Installation"](#).

B29C1 EVSE

< DTC/CIRCUIT DIAGNOSIS >

B29C1 EVSE

DTC Logic

INFOID:000000007634070

DTC DETECTION LOGIC

DTC	Trouble diagnosis name (Malfunction type)		DTC detecting condition	Possible cause
B29C1	A	EVSE (No signal)	During normal charging, although the AC power is being input, the PWM communication signal from EVSE is interrupted.	<ul style="list-style-type: none"> Harness or connectors (Normal charge port is open or shorted)
	B	EVSE (Signal stuck low)	When normal charging, AC power is not input even though the on-board charger permits charging start.	<ul style="list-style-type: none"> Normal charge port EVSE On-board charger
	C	EVSE (Unexpected operation)	When normal charging is started, AC power is input even though the EVSE communication does not start.	<ul style="list-style-type: none"> Harness or connectors (Normal charge port is shorted)
	D	EVSE (Signal stuck high)	After charging is complete, AC power continues to input even though the on-board charger stops charging.	<ul style="list-style-type: none"> EVSE On-board charger
	E	EVSE (Signal invalid)	When an error is detected in a PWM communication signal from EVSE during normal charge.	<ul style="list-style-type: none"> Harness or connectors (Normal charge port is open or shorted) Normal charge port EVSE On-board charger

DTC CONFIRMATION PROCEDURE

TYPE A, B, C AND E

1. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

1. Perform normal charging for the time listed below.

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

2. Turn power switch ON.
3. Check "SELF-DIAG RESULTS" of "CHARGER".

Is DTC detected?

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

TYPE D

1. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

1. Perform normal charging until charging is completed.
2. Turn power switch ON.
3. Check "SELF-DIAG RESULTS" of "CHARGER".

Is DTC detected?

B29C1 EVSE

< DTC/CIRCUIT DIAGNOSIS >

YES >> Proceed to [VC-93, "TYPE C AND D : Diagnosis Procedure"](#).

NO >> INSPECTION END

TYPE A, B AND E

TYPE A, B AND E : Diagnosis Procedure

INFOID:000000007634071

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 disconnect the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- To prevent the removed service plug from being connected by mistake during the procedure, always carry it in your pocket or put it in the tool box.
- Be sure to wear insulating protective equipment consisting of glove, shoes, face shield and glasses 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 [VC-6, "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.
- Erase DTC after the work is completed.

1. CHECK SELF-DIAGNOSTIC RESULT IN VCM

With CONSULT

1. Turn power switch ON.
2. Check "SELF-DIAG RESULTS" of "EV/HEV".

Is any DTC is detected?

YES >> Check the DTC. Refer to [EVC-84, "DTC Index"](#).

NO >> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE AGAIN-I

With CONSULT

1. Erase self-diagnostic result.
2. Turn power switch OFF.
3. Perform DTC confirmation procedure again by using an EVSE other than the one is used for the previous DTC confirmation procedure. Refer to [VC-91, "DTC Logic"](#).

Is the DTC detected again?

YES >> GO TO 3.

NO >> Replace EVSE.

3. PRECONDITIONING

WARNING:

Disconnect high voltage. Refer to [GI-31, "How to Disconnect High Voltage"](#).

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

1. Lift up the vehicle and remove the Li-ion battery under covers. Refer to [EVB-161, "Exploded View"](#) (TYPE 1), [EVB-377, "Exploded View"](#) (TYPE 2), [EVB-597, "Exploded View"](#) (TYPE 3) or [EVB-829, "Exploded View"](#) (TYPE 4).

NOTE:

1. Check the vehicle type to confirm the service information. Refer to [EVB-14, "How to Check Vehicle Type"](#).
2. Disconnect high voltage harness connector from front side of Li-ion battery. Refer to [EVB-161, "Removal and Installation"](#) (TYPE 1), [EVB-377, "Removal and Installation"](#) (TYPE 2), [EVB-597, "Removal and Installation"](#) (TYPE 3) or [EVB-829, "Removal and Installation"](#) (TYPE 4).

B29C1 EVSE

< DTC/CIRCUIT DIAGNOSIS >

- Measure voltage between high voltage harness connector terminals.

DANGER:



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

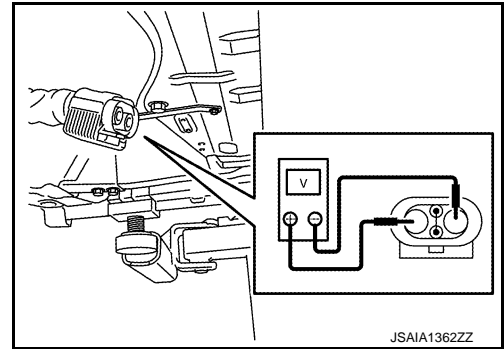


Standard

: 5 V or less

CAUTION:

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



JSAIA1362ZZ

>> GO TO 4.

4.CHECK HIGH VOLTAGE HARNESS

- Disconnect normal charge port harness connector and on-board charger harness connector.
- Check the voltage between normal charge port harness connector and on-board charger harness connector.

+		-		Continuity
Normal charge port		On-board charger		
Connector	Terminal	Connector	Terminal	Existed
H8	4	H6	34	
	5		35	
	6		36	
E71	1	B25	9	
	2		10	

- Also check harness for short to ground and check for short circuit between wires.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.PERFORM DTC CONFIRMATION PROCEDURE AGAIN-II

With CONSULT

- Reconnect all harness connectors disconnected.
- Turn power switch ON.
- Erase self-diagnostic result.
- Turn power switch OFF.
- Perform DTC confirmation procedure. Refer to [VC-91, "DTC Logic"](#).

Is DTC "B29C1" detected?

YES >> Replace on-board charger (fuse is fusing). Refer to [VC-105, "Removal and Installation"](#).

NO >> INSPECTION END

TYPE C AND D

TYPE C AND D : Diagnosis Procedure

INFOID:000000007634072

1.CHECK EVSE SPECIFICATIONS

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

Is the correct EVSE being used?

YES >> GO TO 2.

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

B29C1 EVSE

< DTC/CIRCUIT DIAGNOSIS >

2. PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT

1. Turn power switch ON.
2. Erase self-diagnostic result.
3. Turn power switch OFF.
4. Perform DTC confirmation procedure again by using a EVSE other than the one is used for the previous DTC confirmation procedure. Refer to [VC-91, "DTC Logic"](#).

Is the DTC detected again?

YES >> GO TO 3.

NO >> Replace EVSE.

3. CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-51, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace on-board charger. Refer to [VC-105, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

ON BOARD CHARGER

< DTC/CIRCUIT DIAGNOSIS >

ON BOARD CHARGER

Component Insulation Resistance Check

INFOID:000000007634073

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 disconnect the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- To prevent the removed service plug from being connected by mistake during the procedure, always carry it in your pocket or put it in the tool box.
- Be sure to wear insulating protective equipment consisting of glove, shoes, face shield and glasses 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 [VC-6, "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.
- Erase DTC after the work is completed.

1. PRECONDITIONING

WARNING:

Disconnect high voltage. Refer to [GI-31, "How to Disconnect High Voltage"](#).

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

1. Lift up the vehicle and remove the Li-ion battery under covers. Refer to [EVB-161, "Exploded View"](#) (TYPE 1), [EVB-377, "Exploded View"](#) (TYPE 2), [EVB-597, "Exploded View"](#) (TYPE 3) or [EVB-829, "Exploded View"](#) (TYPE 4).

NOTE:

Check the vehicle type to confirm the service information. Refer to [EVB-14, "How to Check Vehicle Type"](#).

2. Disconnect high voltage harness connector from front side of Li-ion battery. Refer to [EVB-161, "Removal and Installation"](#) (TYPE 1), [EVB-377, "Removal and Installation"](#) (TYPE 2), [EVB-597, "Removal and Installation"](#) (TYPE 3) or [EVB-829, "Removal and Installation"](#) (TYPE 4).
3. Measure voltage between high voltage harness connector terminals.

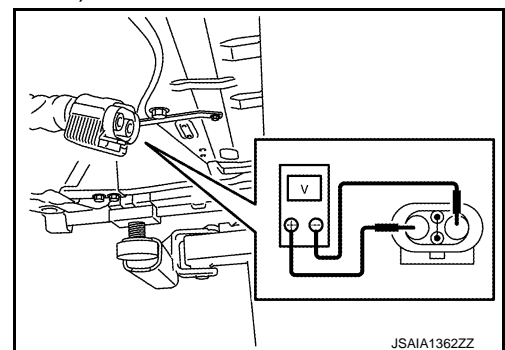
DANGER:

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



Standard

: 5 V or less



CAUTION:

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

>> GO TO 2.

2. CHECK INSULATION RESISTANCE OF ON-BOARD CHARGER

1. Disconnect high voltage harness connector H5.
2. Use an insulation resistor to check the resistance between on-board charger connector terminal and ground.

WARNING:

ON BOARD CHARGER

< DTC/CIRCUIT DIAGNOSIS >



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

CAUTION:

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

+		
On-board charger	-	Resistance
Terminal		
31	Ground	20 MΩ or more
32		

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace on-board charger. Refer to [VC-105. "Removal and Installation"](#).

CHARGING STATUS INDICATOR

< DTC/CIRCUIT DIAGNOSIS >

CHARGING STATUS INDICATOR

Diagnosis Procedure

INFOID:000000007634074

Refer to [EVC-341. "Component Function Check"](#).

A

B

VC

D

E

F

G

H

I

J

K

L

M

N

O

P

IMMEDIATE CHARGING SWITCH

< DTC/CIRCUIT DIAGNOSIS >

IMMEDIATE CHARGING SWITCH

Diagnosis Procedure

INFOID:000000007634075

Refer to [EVC-344, "Diagnosis Procedure"](#).

ON BOARD CHARGER

< SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS

ON BOARD CHARGER

Description

INFOID:000000007634076

Refer to [EVC-347, "Symptom Index"](#).

A

B

VC

D

E

F

G

H

I

J

K

L

M

N

O

P

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

NORMAL OPERATING CONDITION

Symptom Table

INFOID:000000007634077

Symptoms	Check items	Solution
Immediate charge cannot be performed.	There is no power coming from the outlet.	Confirm that there has not been a power failure. Make sure the breaker is on. If an outlet with a timer device installed is used, power will only be available at the time set by the timer.
	The outlet plug is not connected correctly.	Confirm the outlet plug is connected correctly.
	The charge connector is not connected correctly.	Confirm the charge connector is connected correctly.
	Power switch is in the ON position.	Before charging, place power switch in the OFF position.
	Both the normal charge connector and the quick charge connector are connected.	Disconnect a connector of normal charge connector or quick charge connector. NOTE: Normal charge and quick charge cannot perform at the same time.
	Timer charge has been set.	Push immediate charging switch.
	The Li-ion battery is already fully charged.	No action. NOTE: Charging can not be performed if the Li-ion battery is already fully charged. Charging automatically stops if the Li-ion battery is fully charged.
	The temperature of the Li-ion battery is too hot or too cold to charge.	Confirm the Li-ion battery temperature in combination meter. NOTE: If the meter indicates the Li-ion battery is too hot (red zone) or too cold (blue zone), charging is not performed.
	The 12V battery is discharged.	Charge the 12V battery.
The vehicle/EVSE/quick charger malfunctioning	Check self-diagnostic result in on-board charger.	

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

Symptoms	Check items	Solution	
Timer charge cannot be performed.	There is no power coming from the outlet.	Confirm that there has not been a power failure. Make sure the breaker is on. If an outlet with a timer device installed is used, power will only be available at the time set by the timer.	A
	The outlet plug is not connected correctly.	Confirm the outlet plug is connected correctly.	B
	The charge connector is not connected correctly.	Confirm the charge connector is connected correctly.	VC
	Power switch is in the ON position.	Before charging, place power switch in the OFF position.	D
	Both the normal charge connector and the quick charge connector are connected.	Disconnect a connector of normal charge connector or quick charge connector. NOTE: Normal charge and quick charge cannot perform at the same time.	E
	The Li-ion battery is already fully charged.	No action NOTE: Charging cannot be performed if the Li-ion battery is already fully charged. Charging automatically stops if the Li-ion battery is fully charged.	F
	The temperature of the Li-ion battery is too hot or too cold to charge.	Confirm the Li-ion battery temperature in combination meter. NOTE: If the meter indicates the Li-ion battery is too hot (red zone) or too cold (blue zone), charging is not performed.	G
	The 12V battery is discharged.	Charge the 12V battery.	H
	The vehicle/EVSE/quick charger malfunctioning	Check self-diagnostic result in on-board charger.	I
	The EVSE is not connected.	Connect the EVSE.	J
	Charging does not start because the timer charge start time and end time are set and the current time is before the set start time.	Confirm when the timer charge time is set to start charging. Change the timer charge setting to the desired charge time.	K
	Charging does not start because only the timer charge start time is set and the current time is after the set start time.	Confirm when the timer charge time is set to start charging. Change the timer charge setting to the desired charge time.	L
	Charging does not start because only the timer charge end time is set and the current time is after the set end time.	Confirm when the timer charge time is set to start charging. Change the timer charge setting to the desired charge time.	M
	Charging does not start because the charge amount has been set to 80% and the Li-ion battery is already charged to more than 80%.	Confirm the charge percentage set in the timer charge. Change the charging percentage the desired charge setting.	N
	The time on the clock is wrong.	Confirm that the date and time shown on the timer charge screen are the same as the clock on the navigation display. NOTE: If the 12V battery terminal is disconnected, the time setting must be updated. There must be a GPS signal to adjust the timer setting clock.	O
The immediate charging switch has been pressed.	Check immediate charging switch.	P	
Timer charge has not been set.	Set the timer charge schedule.		

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

Symptoms	Check items	Solution
Remote charge cannot be performed.	There is no power coming from the outlet.	Confirm that there has not been a power failure. Make sure the breaker is on. If an outlet with a timer device installed is used, power will only be available at the time set by the timer.
	The outlet plug is not connected correctly.	Confirm the outlet plug is connected correctly.
	The charge connector is not connected correctly.	Confirm the charge connector is connected correctly.
	Power switch is in the ON position.	Before charging, place power switch in the OFF position.
	Both the normal charge connector and the quick charge connector are connected.	Disconnect a connector of normal charge connector or quick charge connector. NOTE: Normal charge and quick charge cannot perform at the same time.
	The Li-ion battery is already fully charged.	No action NOTE: Charging can not be performed if the Li-ion battery is already fully charged. Charging automatically stops if the Li-ion battery is fully charged.
	The temperature of the Li-ion battery is too hot or too cold to charge.	Confirm the Li-ion battery temperature in combination meter. NOTE: If the meter indicates the Li-ion battery is too hot (red zone) or too cold (blue zone), charging is not performed.
	The 12V battery is discharged.	Charge the 12V battery.
	The vehicle/EVSE/quick charger malfunctioning	Check self-diagnostic result in on-board charger.
	The EVSE is not connected.	Connect the EVSE.
	Communication with the vehicle cannot be established.	
		Confirm that there is a cellular signal at the vehicle location.
The vehicle is left standing for long time.	NOTE: If the power switch is in the OFF position for more than 2 weeks, the remote charge is not performed.	

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

Symptoms	Check items	Solution	
Normal charge stops in the middle of charging.	There is no power coming from the outlet.	Confirm that there has not been a power failure. Make sure the breaker is on. If an outlet with a timer device installed is used, power will only be available at the time set by the timer.	A
	The EVSE has been disconnected.	Check that the EVSE has not been disconnected.	B
	The release switch has been pressed.	Release the release switch. NOTE: If the charge connector button is pressed for a long period of time, charging will be stopped.	D
	Timer charge end time has been reached.	perform normal charge (immediate charge). NOTE: When timer charge is set and the charge end time is reached, charging will be stopped, even if the Li-ion battery is not fully charged.	E
	The temperature of the Li-ion battery is too hot or too cold to charge.	Confirm the Li-ion battery temperature in combination meter. NOTE: If the meter indicates the Li-ion battery is too hot (red zone) or too cold (blue zone), charging is not performed.	G
	The vehicle/EVSE/quick charger malfunctioning	Check self-diagnostic result in on-board charger.	H
Quick charge cannot be performed.	The charge connector is not connected correctly.	Check that the charge connector is connected correctly and that it is locked.	I
	The self-diagnostic function of the quick charger detects a isolation error.	VC-51	J
	Power switch is in the ON position.	Before charging, place power switch in the OFF position.	K
	Both the normal charge connector and the quick charge connector are connected.	Disconnect a connector of normal charge connector or quick charge connector. NOTE: Normal charge and quick charge cannot perform at the same time.	L
	The Li-ion battery is already fully charged.	No action NOTE: Charging can not be performed if the Li-ion battery is already fully charged. Charging automatically stops if the Li-ion battery is fully charged.	M
	The temperature of the Li-ion battery is too hot or too cold to charge.	Confirm the Li-ion battery temperature in combination meter. NOTE: If the meter indicates the Li-ion battery is too hot (red zone) or too cold (blue zone), charging is not performed.	N
	The 12V battery is discharged.	Charge the 12V battery.	O
	The vehicle/EVSE/quick charger malfunctioning	Check self-diagnostic result in on-board charger.	P
	The power switch of the quick charger is off.	Check the power switch of the quick charger.	

VC

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

Symptoms	Check items	Solution
Quick charge stops in the middle of charging	Both the normal charge connector and the quick charge connector are connected.	Disconnect a connector of normal charge connector or quick charge connector. NOTE: Normal charge and quick charge cannot perform at the same time.
	The temperature of the Li-ion battery is too hot or too cold to charge.	Confirm the Li-ion battery temperature in combination meter. NOTE: If the meter indicates the Li-ion battery is too hot (red zone) or too cold (blue zone), charging is not performed.
	The vehicle/EVSE/quick charger malfunctioning	Check self-diagnostic result in on-board charger.
	Charging is stopped by the quick charge timer.	Perform quick charge again (as needed). NOTE: Charging will stop depending on the timer function setting of the quick charger.
		Perform quick charge again (as needed). NOTE: Charging will stop depending on the timer of the vehicle.
	Charging stops at 90% capacity.	Perform quick charge again (as needed). NOTE: When charging has been started when the Li-ion battery remaining energy is less than half, charging will stop when the energy reaches 90%.
The power supply for the quick charger is off.	Check whether the power supply for the quick charger is off.	

ON BOARD CHARGER

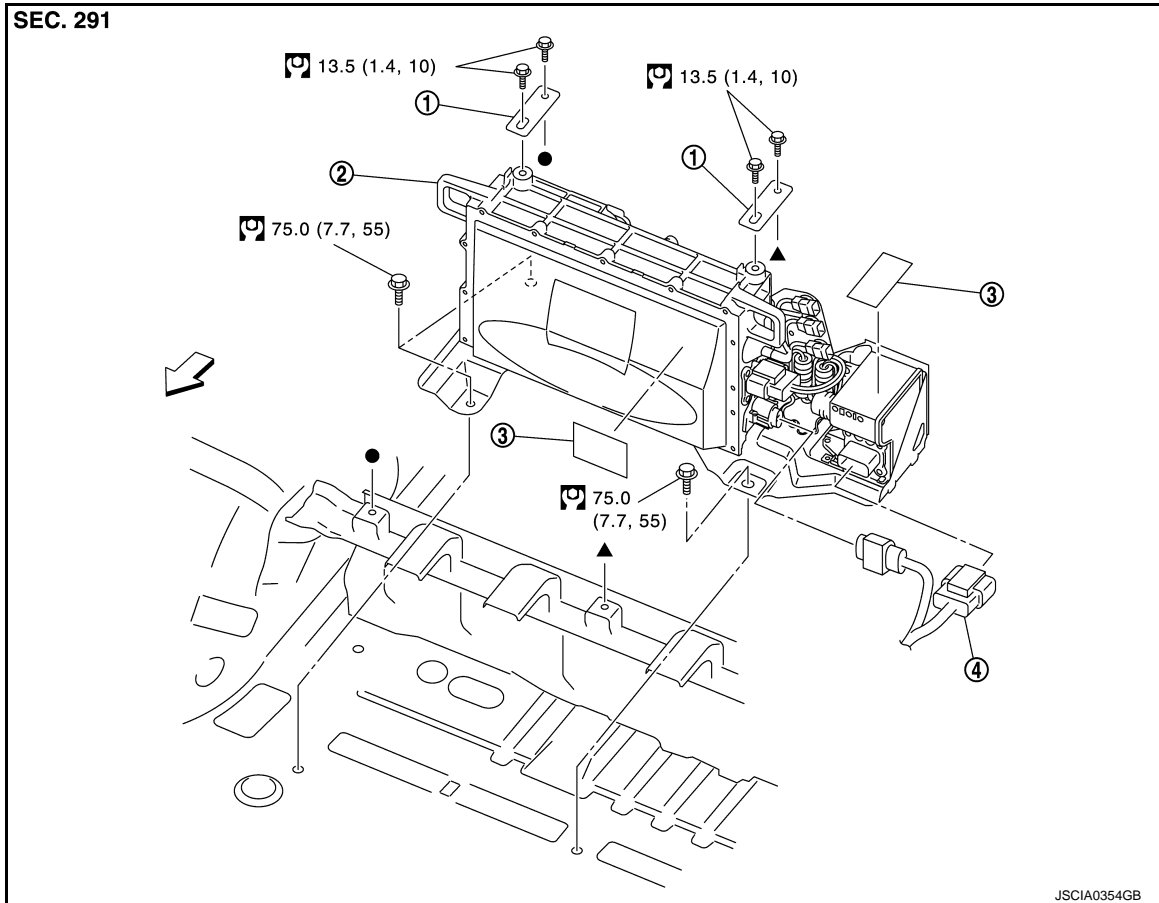
< REMOVAL AND INSTALLATION >

REMOVAL AND INSTALLATION

ON BOARD CHARGER

Exploded View

INFOID:000000007634078



1. Grounding plate 2. On board charger 3. High voltage warning label
4. High voltage harness

↔ : Vehicle front

: N·m (kg-m, ft-lb)

●, ▲: Indicates that the part is connected at points with same symbol in actual vehicle.

Removal and Installation

INFOID:000000007634079

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 disconnect the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- To prevent the removed service plug from being connected by mistake during the procedure, always carry it in your pocket or put it in the tool box.
- Be sure to wear insulating protective equipment consisting of glove, shoes, face shield and glasses 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.

ON BOARD CHARGER

< REMOVAL AND INSTALLATION >

- Refer to [VC-6, "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.

REMOVAL

WARNING:

Disconnect high voltage. Refer to [GI-31, "How to Disconnect High Voltage"](#).

1. Check voltage in high voltage circuit. (Check that condenser are discharged.)
 - a. Lift up the vehicle and remove the Li-ion battery under covers. Refer to [EVB-161, "Removal and Installation"](#) (TYPE 1), [EVB-377, "Removal and Installation"](#) (TYPE 2), [EVB-597, "Removal and Installation"](#) (TYPE 3) or [EVB-829, "Removal and Installation"](#) (TYPE 4).

NOTE:

Check the vehicle type to confirm the service information. Refer to [EVB-14, "How to Check Vehicle Type"](#).

- b. Disconnect high voltage harness connector from front side of Li-ion battery. Refer to [EVB-161, "Removal and Installation"](#) (TYPE 1), [EVB-377, "Removal and Installation"](#) (TYPE 2), [EVB-597, "Removal and Installation"](#) (TYPE 3) or [EVB-829, "Removal and Installation"](#) (TYPE 4).

NOTE:

Check the vehicle type to confirm the service information. Refer to [EVB-14, "How to Check Vehicle Type"](#).

- c. Measure voltage between high voltage harness connector terminals.

DANGER:

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



Standard


: 5 V or less

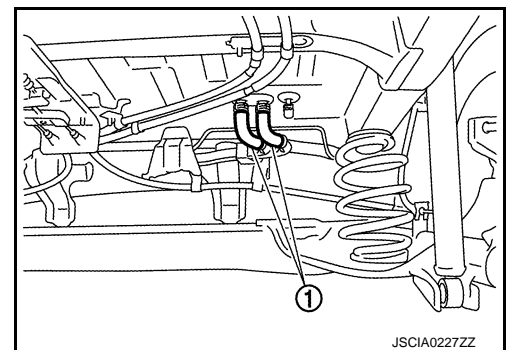
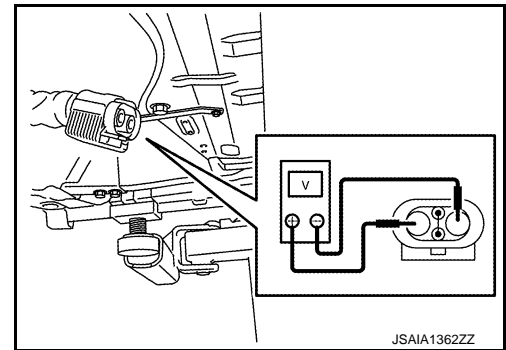
CAUTION:

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

2. Remove rear under cover. Refer to [EXT-23, "REAR DIFFUSER : Exploded View"](#).
3. Drain coolant from radiator. Refer to [HCO-11, "Draining and Refilling"](#).
4. Disconnect water hoses (1) from on-board charger.

WARNING:

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



5. Remove rear seatback. Refer to [SE-30, "SEATBACK : Removal and Installation"](#).
6. Remove seat cushion. Refer to [SE-35, "SEAT CUSHION : Removal and Installation"](#).
7. Remove luggage floor upper finisher. Refer to [INT-37, "LUGGAGE FLOOR UPPER FINISHER : Removal and Installation"](#).
8. Remove luggage floor front finisher. Refer to [INT-38, "LUGGAGE FLOOR FRONT FINISHER : Removal and Installation"](#).

ON BOARD CHARGER

< REMOVAL AND INSTALLATION >

9. Disconnect high voltage harness connector (A) of on-board charger, and high voltage harness connector (B) of noise filter.

WARNING:

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

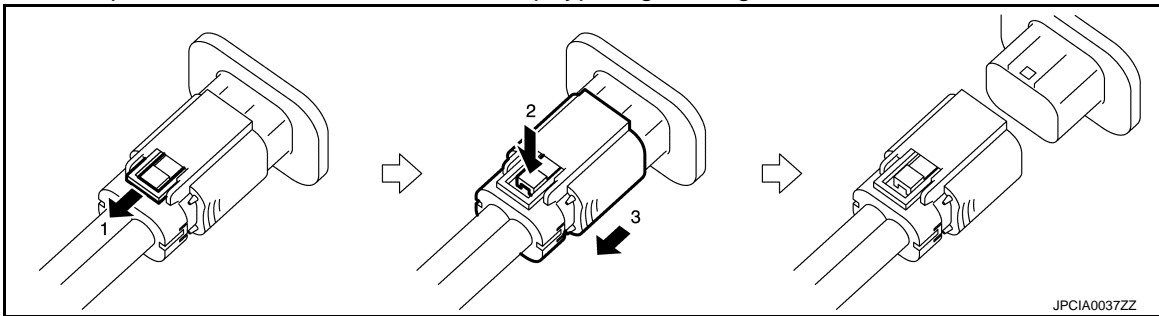


- Protect the terminals of disconnected high voltage harness connector with insulation tape so that they are not exposed.

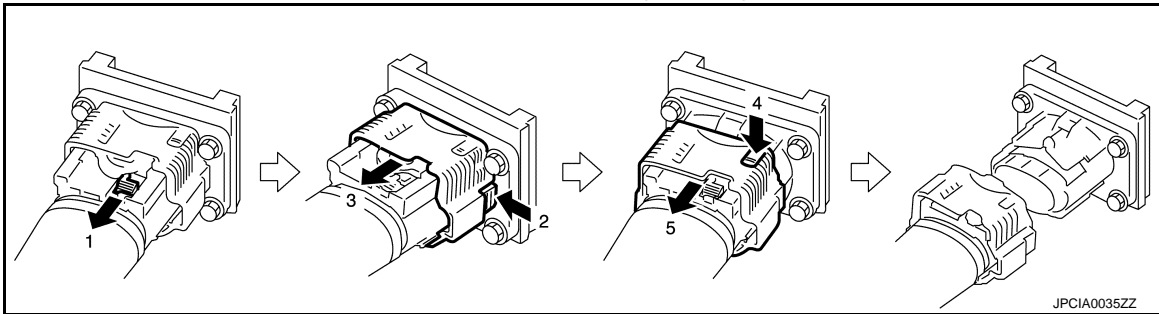
On-board charger high voltage connector : 3 step type

Noise filter high voltage connector : 2 step type

- Follow steps shown below to remove a 2-step type high voltage connector.



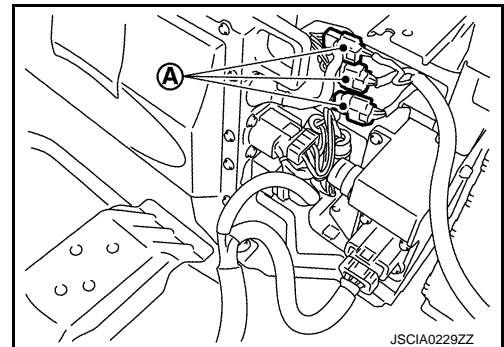
- Follow steps shown below to remove a 3-step type high voltage connector.



10. Disconnect 12V system connector (A) of on-board charger.

WARNING:

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



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ON BOARD CHARGER

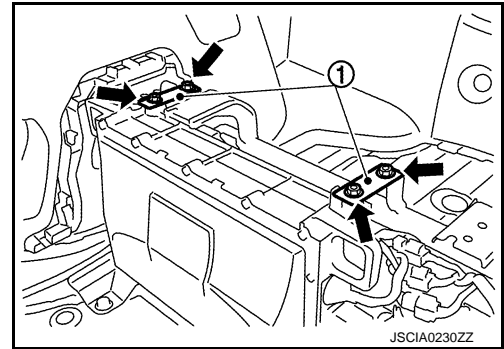
< REMOVAL AND INSTALLATION >

11. Remove grounding plate (1) of on-board charger.

WARNING:



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



12. Remove on-board charger mounting bolt (A).

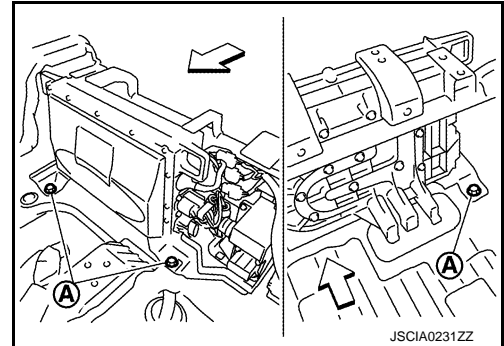


: Vehicle front

WARNING:



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



13. Move on-board charger toward vehicle left side while avoiding right side trim, then remove on-board charger by tilting it toward the front while avoiding tower bar.

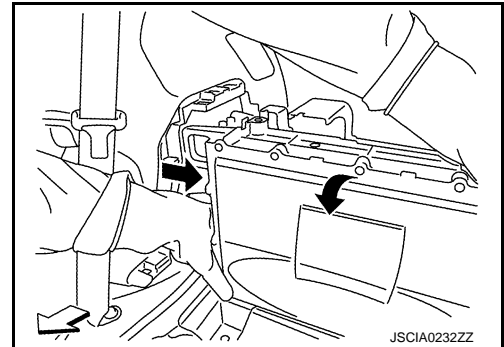


: Vehicle front

WARNING:



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



CAUTION:

- Take care that coolant does not contact the high voltage harness connectors.
- If coolant contacts a high voltage harness connector, immediately use an air blow and fully remove the liquid.

INSTALLATION

Pay attention to the following and install by following the procedure for removal in the reverse order.

WARNING:



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



CAUTION:

- Be sure to reinstall high voltage harness clips in their original positions. If a clip is damaged, replace it with a new clip before installing.
- Be sure to perform correct air bleeding after adding coolant. Refer to [HCO-11, "Draining and Refilling"](#).

QUICK CHARGE PORT

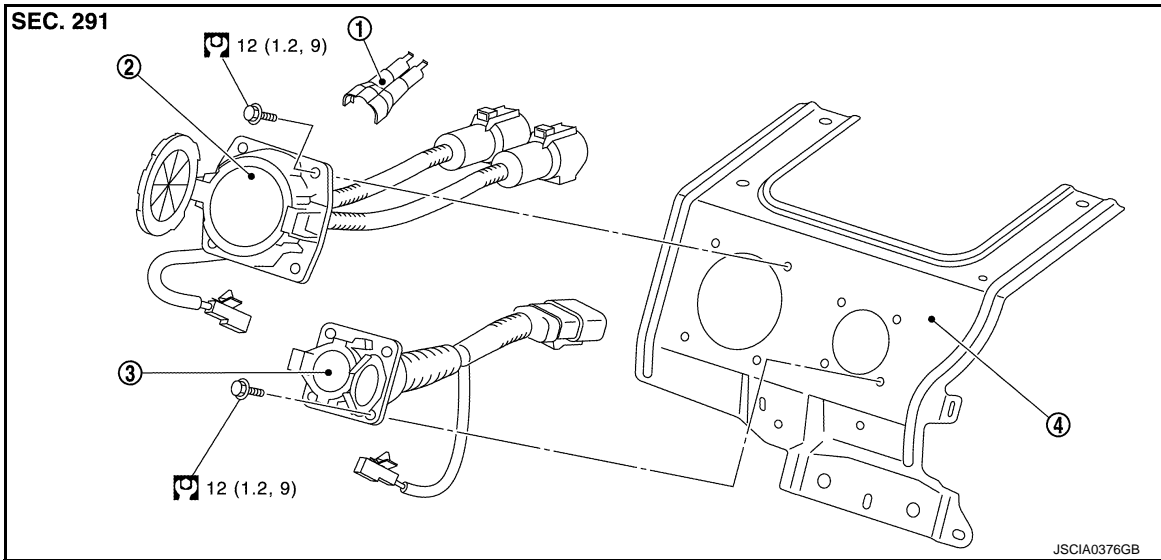
< REMOVAL AND INSTALLATION >

QUICK CHARGE PORT


Exploded View

INFOID:000000007634081

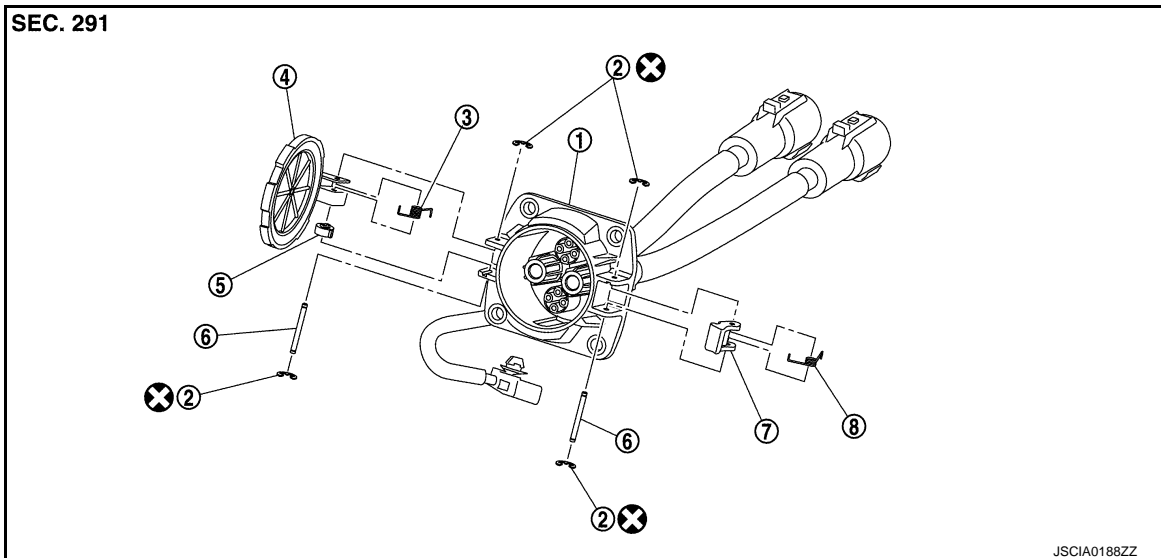
REMOVAL




- 1. Harness protector
- 2. Quick charge port
- 3. Normal charge port
- 4. Charge port bracket

 : N·m (kg-m, ft-lb)

DISASSEMBLY



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

 : Always replace after every disassembly.

Removal and Installation

INFOID:000000007634082

WARNING:

QUICK CHARGE PORT

< REMOVAL AND INSTALLATION >

- 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 disconnect the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- To prevent the removed service plug from being connected by mistake during the procedure, always carry it in your pocket or put it in the tool box.
- Be sure to wear insulating protective equipment consisting of glove, shoes, face shield and glasses 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 [VC-6, "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.

REMOVAL

WARNING:

Disconnect high voltage. Refer to [GI-31, "How to Disconnect High Voltage"](#).

1. Check voltage in high voltage circuit. (Check that condenser are discharged.)
 - a. Lift up the vehicle and remove the Li-ion battery under covers. Refer to [EVB-161, "Removal and Installation"](#) (TYPE 1), [EVB-377, "Removal and Installation"](#) (TYPE 2), [EVB-597, "Removal and Installation"](#) (TYPE 3) or [EVB-829, "Removal and Installation"](#) (TYPE 4).

NOTE:

Check the vehicle type to confirm the service information. Refer to [EVB-14, "How to Check Vehicle Type"](#).

- b. Disconnect high voltage harness connector from front side of Li-ion battery. Refer to [EVB-161, "Removal and Installation"](#) (TYPE 1), [EVB-377, "Removal and Installation"](#) (TYPE 2), [EVB-597, "Removal and Installation"](#) (TYPE 3) or [EVB-829, "Removal and Installation"](#) (TYPE 4).

NOTE:

Check the vehicle type to confirm the service information. Refer to [EVB-14, "How to Check Vehicle Type"](#).

- c. Measure voltage between high voltage harness connector terminals.

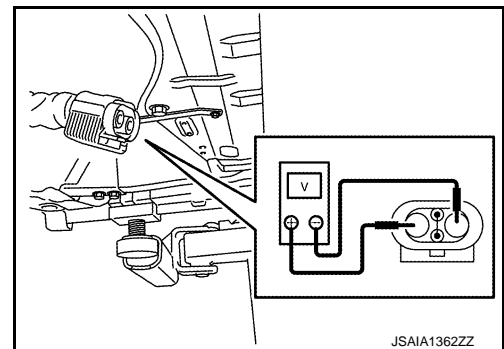
DANGER:

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



Standard

: 5 V or less



CAUTION:

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

2. Remove radiator upper grille. Refer to [DLK-141, "RADIATOR CORE SUPPORT UPPER : Removal and Installation"](#).

QUICK CHARGE PORT

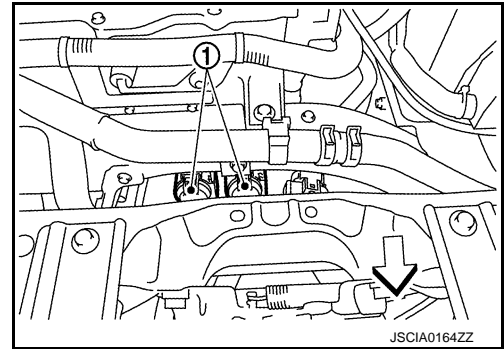
< REMOVAL AND INSTALLATION >

3. Remove quick charge port connector (1) inside motor room.

← : Vehicle front

WARNING:

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



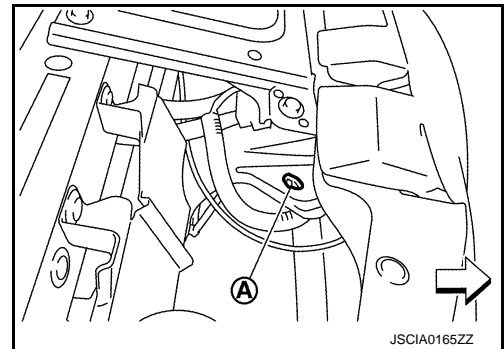
- Protect the terminals of disconnected high voltage harness connector with insulation tape so that they are not exposed.

4. Remove connector clip (A), and then remove interlock detecting circuit connector.

← : Vehicle front

WARNING:

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



5. Remove quick charge port mounting bolts, and pull quick charge port out from front of vehicle to remove it.

WARNING:

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



INSTALLATION

To install, pay attention to the following and follow procedure for removal in reverse order.

CAUTION:

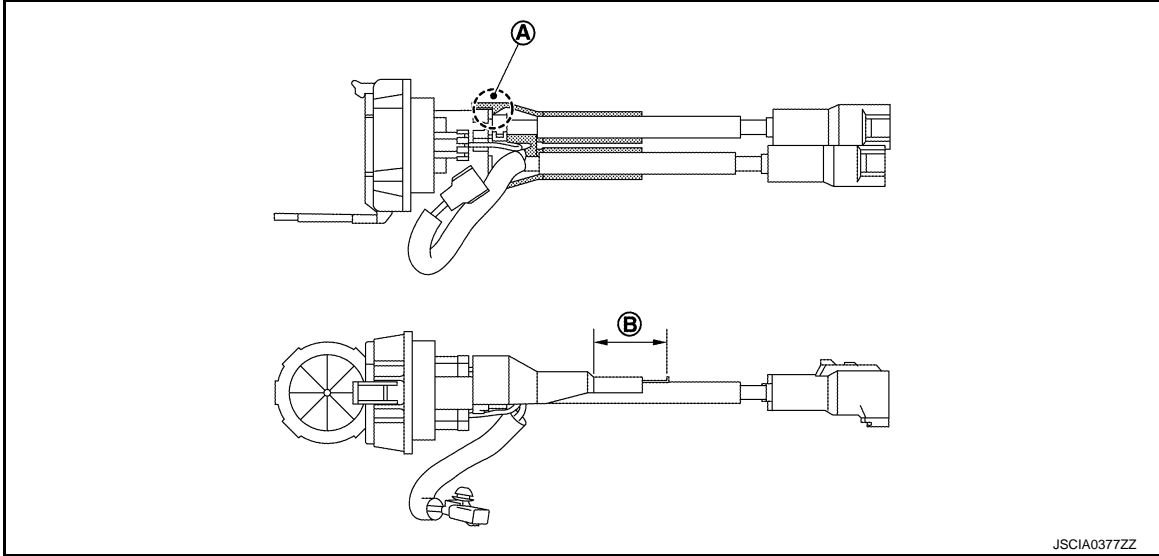
Be sure to reinstall high voltage harness clips in their original positions. If a clip is damaged, replace it with a new clip before installing.

Harness Protector Installation Procedure

QUICK CHARGE PORT

< REMOVAL AND INSTALLATION >

Set the protector at the position (A), wind vinyl tape for wire harness around (B) in the manner of half-lap to fix the harness protector.



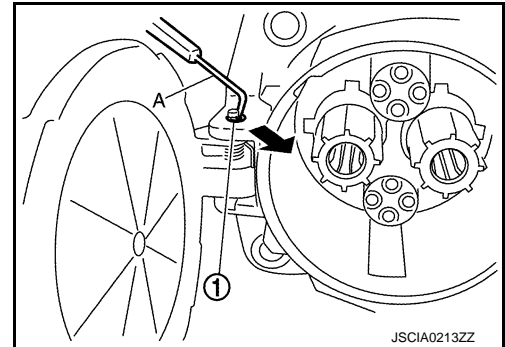
Disassembly and Assembly

INFOID:000000007634083

DISASSEMBLY

Cover Side

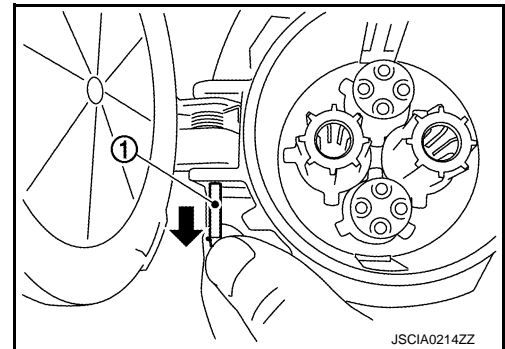
1. Use a suitable tool (A) to remove the clip (1) that is attached to the pin.



2. Pull out pin (1) of charge port cover.

CAUTION:

When pin is pulled out, the spring will also jump out. Take care not to lose it.

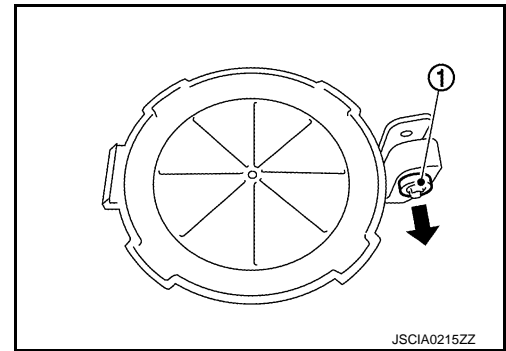


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QUICK CHARGE PORT

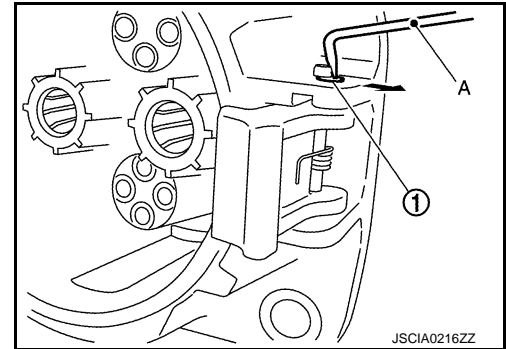
< REMOVAL AND INSTALLATION >

3. Remove damper (1) from charge port cover.

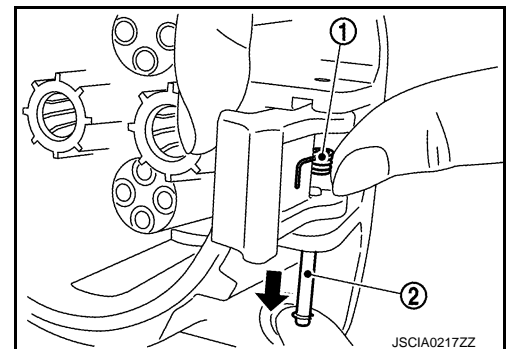


Lever Side

1. Use a suitable tool (A) to remove the clip (1) that is attached to the pin.



2. Press while removing pin (2) to ensure that spring (1) does not jump out, then remove lever.



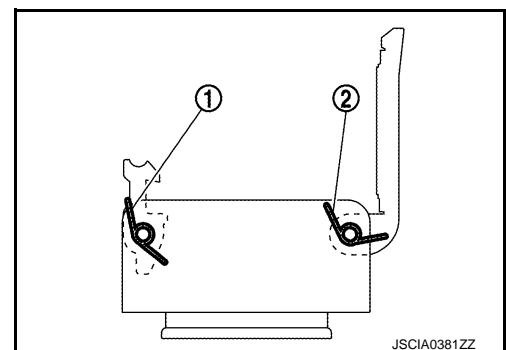
ASSEMBLY

Note the following, and assemble in the reverse order of disassembly.

CAUTION:

- **Never reuse the clips.**
- **Pay attention to direction that cover side damper is facing.**
- **Pay attention to direction that spring is facing.**

- (1) : Spring (small)
(2) : Spring (large)



NORMAL CHARGE PORT

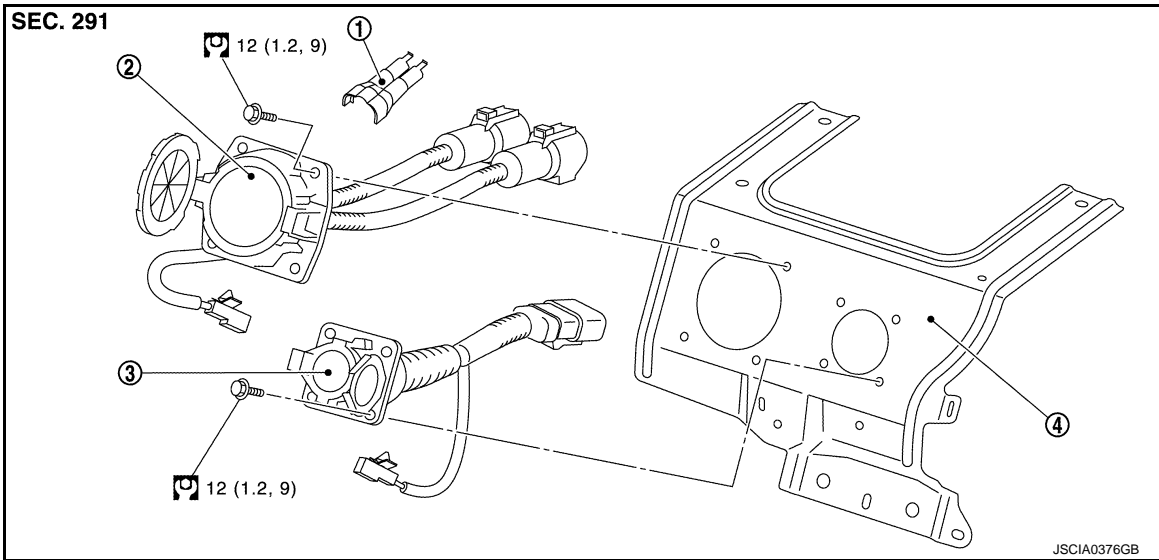
< REMOVAL AND INSTALLATION >

NORMAL CHARGE PORT

Exploded View

INFOID:000000007634084

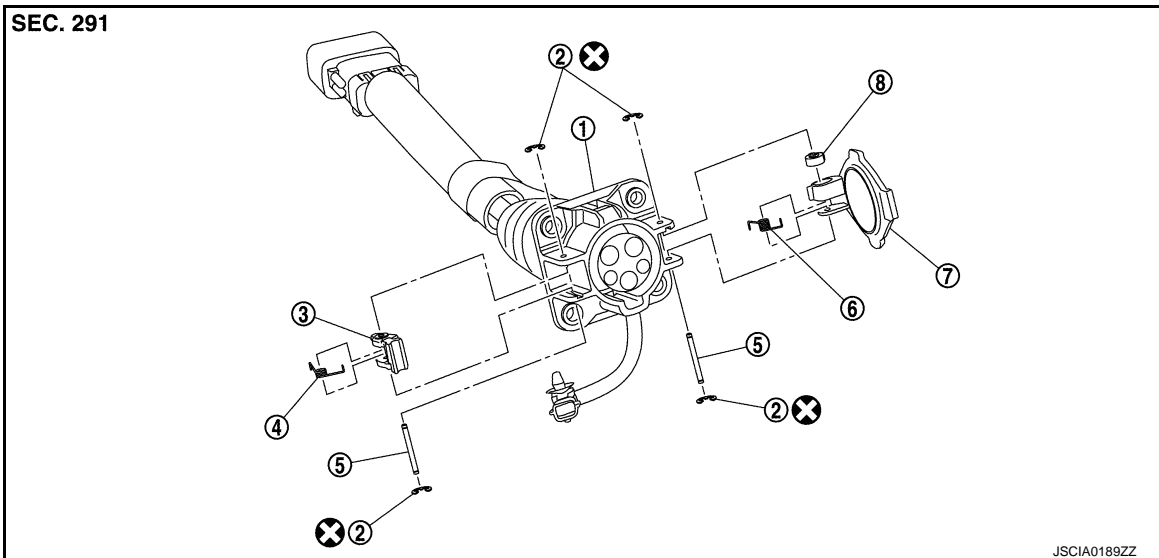
REMOVAL



- 1. Harness protector
- 2. Quick charge port
- 3. Normal charge port
- 4. Charge port bracket

: N·m (kg·m, ft·lb)

DISASSEMBLY



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

: Always replace after every disassembly.

Removal and Installation

INFOID:000000007634085

WARNING:

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NORMAL CHARGE PORT

< REMOVAL AND INSTALLATION >

- 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 disconnect the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- To prevent the removed service plug from being connected by mistake during the procedure, always carry it in your pocket or put it in the tool box.
- Be sure to wear insulating protective equipment consisting of glove, shoes, face shield and glasses 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 [VC-6, "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.

REMOVAL

WARNING:

Disconnect high voltage. Refer to [GI-31, "How to Disconnect High Voltage"](#).

1. Check voltage in high voltage circuit. (Check that condenser are discharged.)
 - a. Lift up the vehicle and remove the Li-ion battery under covers. Refer to [EVB-161, "Removal and Installation"](#) (TYPE 1), [EVB-377, "Removal and Installation"](#) (TYPE 2), [EVB-597, "Removal and Installation"](#) (TYPE 3) or [EVB-829, "Removal and Installation"](#) (TYPE 4).

NOTE:

Check the vehicle type to confirm the service information. Refer to [EVB-14, "How to Check Vehicle Type"](#).

- b. Disconnect high voltage harness connector from front side of Li-ion battery. Refer to [EVB-161, "Removal and Installation"](#) (TYPE 1), [EVB-377, "Removal and Installation"](#) (TYPE 2), [EVB-597, "Removal and Installation"](#) (TYPE 3) or [EVB-829, "Removal and Installation"](#) (TYPE 4).

NOTE:

Check the vehicle type to confirm the service information. Refer to [EVB-14, "How to Check Vehicle Type"](#).

- c. Measure voltage between high voltage harness connector terminals.

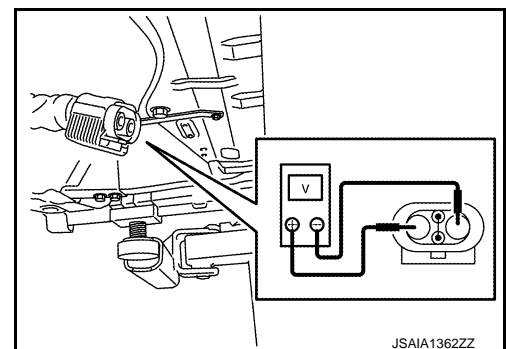
DANGER:

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



Standard

: 5 V or less



CAUTION:

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

2. Remove radiator upper grille. Refer to [DLK-141, "RADIATOR CORE SUPPORT UPPER : Removal and Installation"](#).

NORMAL CHARGE PORT

< REMOVAL AND INSTALLATION >

3. Remove normal charge port connector (1) inside motor room.

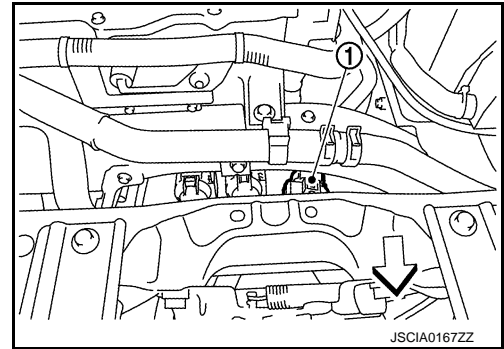
← : Vehicle front

WARNING:

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



- Protect the terminals of disconnected high voltage harness connector with insulation tape so that they are not exposed.

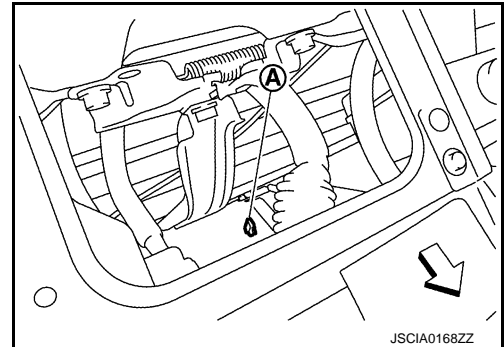


4. Remove connector clip (A), and then remove interlock detecting circuit connector.

← : Vehicle front

WARNING:

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



5. Remove normal charge port mounting bolts, and pull normal charge port out from front of vehicle to remove it.

WARNING:

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



INSTALLATION

To install, pay attention to the following and follow procedure for removal in reverse order.

CAUTION:

Be sure to reinstall high voltage harness clips in their original positions. If a clip is damaged, replace it with a new clip before installing.

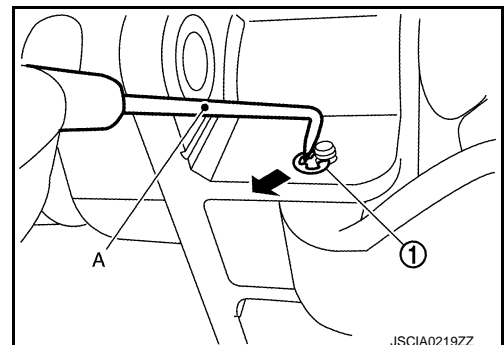
Disassembly and Assembly

INFOID:000000007634086

DISASSEMBLY

Cover Side

1. Use a suitable tool (A) to remove the clip (1) that is attached to the pin.



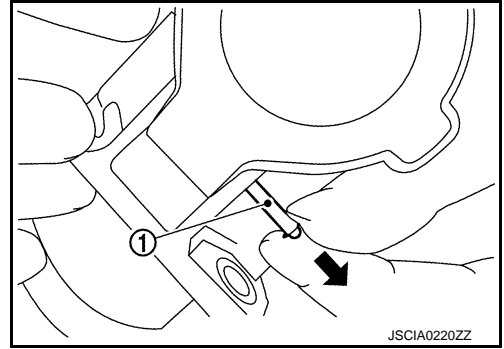
NORMAL CHARGE PORT

< REMOVAL AND INSTALLATION >

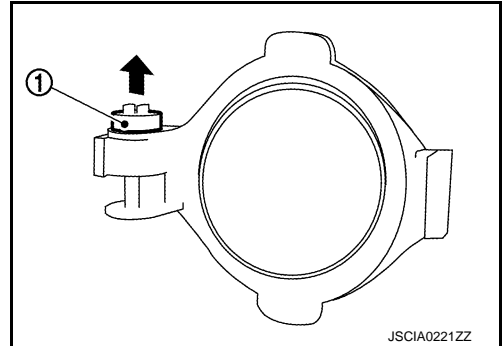
2. Pull out pin (1) of charge port cover.

CAUTION:

When pin is pulled out, the spring will also jump out. Take care not to lose it.

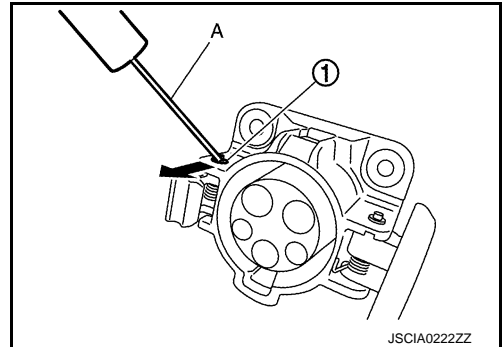


3. Remove damper (1) from charge port cover.

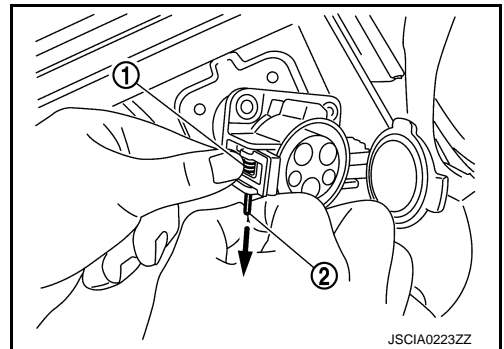


Lever Side

1. Use a suitable tool (A) to remove the clip (1) that is attached to the pin.



2. Press while removing pin (2) to ensure that spring (1) does not jump out, then remove lever.



ASSEMBLY

Note the following, and assemble in the reverse order of disassembly.

CAUTION:

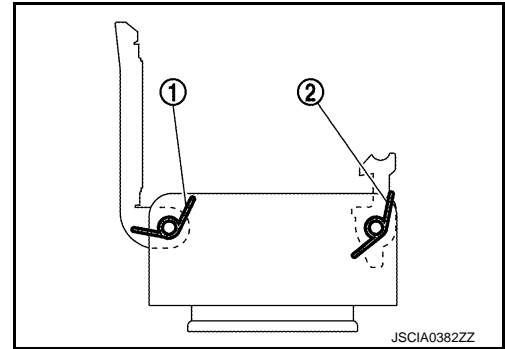
- Never reuse the clips.
- Pay attention to direction that cover side damper is facing.

NORMAL CHARGE PORT

< REMOVAL AND INSTALLATION >

- Pay attention to direction that spring is facing.

- (1) : Spring (large)
- (2) : Spring (small)



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IMMEDIATE CHARGING SWITCH

< REMOVAL AND INSTALLATION >

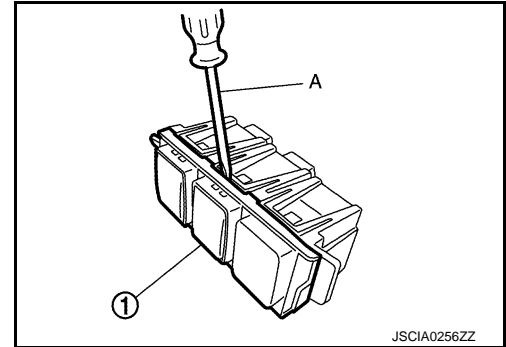
IMMEDIATE CHARGING SWITCH

Removal and Installation

INFOID:000000007634087

REMOVAL

1. Remove instrument lower panel LH. Refer to [IP-13. "Exploded View"](#).
2. Remove switch panel assembly from instrument lower panel LH.
3. Remove immediate charging switch (1) from switch panel using a suitable tool (A).



INSTALLATION

Install in the reverse order of removal.

CHARGING STATUS INDICATOR

< REMOVAL AND INSTALLATION >

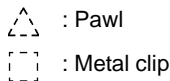
CHARGING STATUS INDICATOR

Removal and Installation

INFOID:000000007634088

REMOVAL

1. Remove charging status indicator.
 1. Apply protective tape (A) on the part to protect it from damage.
 2. Insert remover tool (A) between charging status indicator and instrument panel assembly to disengage the pawl and metal clips as shown in the figure.
 3. Pull toward the arrow direction.
 4. Disconnect harness connector.

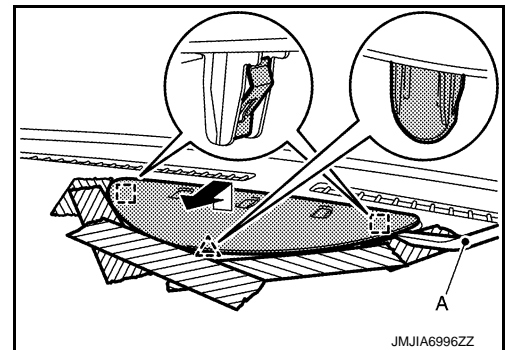
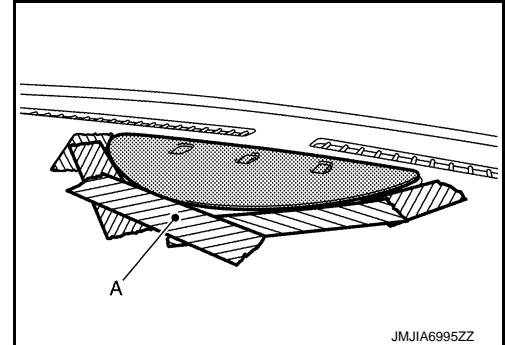


CAUTION:

Apply shop cloth or take similar steps at location of tool fulcrum, and take care that no scratches or dents are made.

INSTALLATION

Position clips, and then press each into the instrument panel to fasten clips in place.



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